# TB511, TB521, TB523, TB541
## Terminal Base

## 1 Ordering Data

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Product Life Cycle Phase *)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SAP 111 100 R0260</td>
<td>TB511-ARCNET, terminal base AC500, slots: 1 processor module, 1 communication module, ARCNET COAX connector</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 111 100 R0270</td>
<td>TB511-ETH, terminal base AC500, slots: 1 processor module, 1 communication module, Ethernet RJ45 connector</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 311 100 R0270</td>
<td>TB511-ETH-XC, terminal base AC500, slots: 1 processor module, 1 communication module, Ethernet RJ45 connector, XC version</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 112 100 R0260</td>
<td>TB521-ARCNET, terminal base AC500, slots: 1 processor module, 2 communication modules, ARCNET COAX connector</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 112 100 R0270</td>
<td>TB521-ETH, terminal base AC500, slots: 1 processor module, 2 communication modules, with network interface Ethernet RJ45</td>
<td>Active</td>
</tr>
<tr>
<td>Part No.</td>
<td>Description</td>
<td>Product Life Cycle Phase *)</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>1SAP 312 100 R0270</td>
<td>TB521-ETH-XC, terminal base AC500, slots: 1 processor module, 2 communication modules, with network interface Ethernet RJ45, XC version</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 112 300 R0277</td>
<td>TB523-2ETH, terminal base AC500, slots: 1 processor module, 2 communication modules, with 2 network interfaces Ethernet RJ45</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 114 100 R0270</td>
<td>TB541-ETH, slots: 1 processor module, 4 communication modules, with network interface Ethernet RJ45</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 314 100 R0270</td>
<td>TB541-ETH-XC, slots: 1 processor module, 4 communication modules, with network interface Ethernet RJ45, XC version</td>
<td>Active</td>
</tr>
</tbody>
</table>

*) For planning and commissioning of new installations use modules in Active status only.

Processor module PM591-2ETH can only be used with TB523-2ETH.

Processor modules PM57x-ETH(-XC), PM58x-ETH(-XC) and PM59x-ETH(-XC) with ordering No. 1SAPxxxxxxR0271 can only be used with terminal bases TB5x1-ETH(-XC) with ordering No. 1SAPxxxxxxR0270.

Table 1: Accessories

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SAP 180 200 R0001</td>
<td>TK501, programming cable D-sub / D-sub, length: 5 m</td>
</tr>
<tr>
<td>1SAP 180 200 R0101</td>
<td>TK502, programming cable terminal block / D-sub, length: 5 m</td>
</tr>
<tr>
<td>1TNE 968 901 R1100</td>
<td>TK503, programming cable USB / D-sub (RS-485), length 3 m</td>
</tr>
<tr>
<td>1SAP 180 800 R0001</td>
<td>TA526, wall mounting accessory</td>
</tr>
</tbody>
</table>
2 Dimensions

The dimensions are in mm and in brackets in inch.

3 Technical Data

The System Data of AC500 and S500 is valid for standard version.

The System Data of AC500-XC is valid for the XC version.

Only additional details are therefore documented below.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection of the supply voltage 24 VDC at the terminal base of the processor module</td>
<td>removable 5-pin terminal block spring type</td>
</tr>
<tr>
<td>Slots</td>
<td>TB511: 1 processor module, 1 communication module</td>
</tr>
<tr>
<td></td>
<td>TB521 / TB523: 1 processor module, 2 communication modules</td>
</tr>
<tr>
<td></td>
<td>TB541: 1 processor module, 4 communication modules</td>
</tr>
<tr>
<td>Processor module interfaces at TB5x1</td>
<td>I/O bus, COM1, COM2, FBP</td>
</tr>
<tr>
<td>Processor module interfaces at TB5x3</td>
<td>I/O bus, COM1</td>
</tr>
<tr>
<td>Processor module network interfaces</td>
<td>TB5x1-ETH / PM5xx-ETH: Ethernet</td>
</tr>
</tbody>
</table>
### 4 System Data AC500

#### 4.1 Environmental Conditions

**Table 2: Process and supply voltages**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 VDC</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>24 V (-15 %, +20 %)</td>
</tr>
<tr>
<td>Protection against reverse polarity</td>
<td>Yes</td>
</tr>
<tr>
<td>120 VAC</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>120 V (-15 %, +10 %)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz (-6 %, +4 %)</td>
</tr>
<tr>
<td>230 VAC</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>230 VAC (-15 %, +10 %)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz (-6 %, +4 %)</td>
</tr>
<tr>
<td>120 VAC...240 VAC wide range supply</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>120 V...240 V (-15 %, +10 %)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz (-6 %, +4 %)</td>
</tr>
</tbody>
</table>

**Allowed interruptions of power supply, according to EN 61131-2**

| DC supply                  | Interruption < 10 ms, time between 2 interruptions > 1 s, PS2        |
| AC supply                  | Interruption < 0.5 periods, time between 2 interruptions > 1 s        |

**NOTICE!**

Exceeding the maximum power supply voltage for process or supply voltages could lead to unrecoverable damage of the system. The system could be destroyed.

**NOTICE!**

Improper voltage level or frequency range which cause damage of AC inputs:

- AC voltage above 264 V
- Frequency below 47 Hz or above 62.4 Hz
NOTICE!
Improper connection leads cause overtemperature on terminals.
PLC modules may be destroyed by using wrong cable type, wire size and cable temperature classification.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>0 °C...+60 °C: Horizontal mounting of modules. 0 °C...+40 °C: Vertical mounting of modules. Output load reduced to 50 % per group.</td>
</tr>
<tr>
<td>Storage</td>
<td>-40 °C...+70 °C</td>
</tr>
<tr>
<td>Transport</td>
<td>-40 °C...+70 °C</td>
</tr>
<tr>
<td>Humidity</td>
<td>Max. 95 %, without condensation</td>
</tr>
<tr>
<td>Air pressure</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>&gt; 800 hPa / &lt; 2000 m</td>
</tr>
<tr>
<td>Storage</td>
<td>&gt; 660 hPa / &lt; 3500 m</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP20</td>
</tr>
</tbody>
</table>

### 4.2 Creepage Distances and Clearances
The creepage distances and clearances meet the requirements of the overvoltage category II, pollution degree 2.

### 4.3 Insulation Test Voltages, Routine Test
According to EN 61131-2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 V circuits against other circuitry</td>
<td>2500 V</td>
</tr>
<tr>
<td>120 V circuits against other circuitry</td>
<td>1500 V</td>
</tr>
<tr>
<td>120 V...240 V circuits against other circuitry</td>
<td>2500 V</td>
</tr>
<tr>
<td>24 V circuits (supply, 24 V inputs/outputs, analogue inputs/outputs), if they are electrically isolated against other circuitry</td>
<td>500 V</td>
</tr>
<tr>
<td>COM interfaces, electrically isolated</td>
<td>500 V</td>
</tr>
<tr>
<td>COM interfaces, electrically not isolated</td>
<td>Not applicable</td>
</tr>
<tr>
<td>FBP interface</td>
<td>500 V</td>
</tr>
<tr>
<td>Ethernet</td>
<td>500 V</td>
</tr>
<tr>
<td>ARCNET</td>
<td>500 V</td>
</tr>
</tbody>
</table>
### 4.4 Power Supply Units

For the supply of the modules, power supply units according to PELV specifications must be used.

### 4.5 Electromagnetic Compatibility

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 V circuits against other circuitry</td>
<td>1350 V AC 2 s</td>
</tr>
<tr>
<td>120 V circuits against other circuitry</td>
<td>820 V AC 2 s</td>
</tr>
<tr>
<td>120 V...240 V circuits against other circuitry</td>
<td>1350 V AC 2 s</td>
</tr>
<tr>
<td>24 V circuits (supply, 24 V inputs/outputs, analogue inputs/outputs), if they are electrically isolated against other circuitry</td>
<td>350 V AC 2 s</td>
</tr>
<tr>
<td>COM interfaces, electrically isolated</td>
<td>350 V AC 2 s</td>
</tr>
<tr>
<td>COM interfaces, electrically not isolated</td>
<td>Not applicable Not applicable</td>
</tr>
<tr>
<td>FBP interface</td>
<td>350 V AC 2 s</td>
</tr>
<tr>
<td>Ethernet</td>
<td>350 V AC 2 s</td>
</tr>
<tr>
<td>ARCNET</td>
<td>350 V AC 2 s</td>
</tr>
</tbody>
</table>

#### Electromagnetic Compatibility

- **Device suitable for:**
  - Industrial applications: Yes
  - Domestic applications: No

- **Immunity against electrostatic discharge (ESD):**
  - According to IEC 61000-4-2, zone B, criterion B

- **Electrostatic voltage in case of air discharge:** 8 kV
- **Electrostatic voltage in case of contact discharge:** 4 kV, in a closed switch-gear cabinet 6 kV \(^1\)

- **ESD with communication connectors:**
  - In order to prevent operating malfunctions, it is recommended, that the operating personnel discharge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges.

- **ESD with connectors of Terminal Bases:**
  - The connectors between the Terminal Bases and Processor Modules or Communication Modules must not be touched during operation. The same is valid for the I/O-Bus with all modules involved.
Electromagnetic Compatibility

<table>
<thead>
<tr>
<th>Immunity against the influence of radiated (CW radiated):</th>
<th>According to IEC 61000-4-3, zone B, criterion A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test field strength</td>
<td>10 V/m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Immunity against fast transient interference voltages (burst):</th>
<th>According to IEC 61000-4-4, zone B, criterion B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage units (DC)</td>
<td>2 kV</td>
</tr>
<tr>
<td>Supply voltage units (AC)</td>
<td>2 kV</td>
</tr>
<tr>
<td>Digital inputs/outputs (24 VDC)</td>
<td>1 kV</td>
</tr>
<tr>
<td>Digital inputs/outputs (120 VAC...240 VAC)</td>
<td>2 kV</td>
</tr>
<tr>
<td>Analog inputs/outputs</td>
<td>1 kV</td>
</tr>
<tr>
<td>CS31 system bus</td>
<td>1 kV</td>
</tr>
<tr>
<td>Serial RS-485 interfaces (COM)</td>
<td>1 kV</td>
</tr>
<tr>
<td>Serial RS-232 interfaces (COM, not for PM55x and PM56x)</td>
<td>1 kV</td>
</tr>
<tr>
<td>ARCNET</td>
<td>1 kV</td>
</tr>
<tr>
<td>FBP</td>
<td>1 kV</td>
</tr>
<tr>
<td>Ethernet</td>
<td>1 kV</td>
</tr>
<tr>
<td>I/O supply (DC-out)</td>
<td>1 kV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Immunity against the influence of line-conducted interferences (CW conducted):</th>
<th>According to IEC 61000-4-6, zone B, criterion A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test voltage</td>
<td>3V zone B, 10 V is also met.</td>
</tr>
<tr>
<td>High energy surges</td>
<td>According to IEC 61000-4-5, zone B, criterion B</td>
</tr>
<tr>
<td>Power supply DC</td>
<td>1 kV CM / 0.5 kV DM ²)</td>
</tr>
<tr>
<td>DC I/O supply</td>
<td>0.5 kV CM / 0.5 kV DM ²)</td>
</tr>
<tr>
<td>Communication Lines, shielded</td>
<td>1 kV CM ²)</td>
</tr>
<tr>
<td>AC I/O unshielded</td>
<td>2 kV CM / 1 kV DM ²)</td>
</tr>
<tr>
<td>I/O analog, I/O DC unshielded</td>
<td>1 kV CM / 0.5 kV DM ²)</td>
</tr>
</tbody>
</table>

Radiation (radio disturbance) According to IEC 55011, group 1, class A

¹) High requirement for shipping classes are achieved with additional specific measures (see specific documentation).

²) CM = Common Mode, DM = Differential Mode

4.6 Mechanical Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 20</td>
</tr>
<tr>
<td>Housing</td>
<td>Classification V-2 according to UL 94</td>
</tr>
<tr>
<td>Parameter</td>
<td>Value</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Vibration resistance acc. to EN 61131-2</td>
<td>all three axes</td>
</tr>
<tr>
<td></td>
<td>2 Hz...8.4 Hz, continuous 3.5 mm</td>
</tr>
<tr>
<td></td>
<td>8.4 Hz...150 Hz, continuous 1 g (higher values on request)</td>
</tr>
<tr>
<td>Shock test</td>
<td>All three axes</td>
</tr>
<tr>
<td></td>
<td>15 g, 11 ms, half-sinusoidal</td>
</tr>
</tbody>
</table>

**Mounting of the modules:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN rail according to DIN EN 50022</td>
<td>35 mm, depth 7.5 mm or 15 mm</td>
</tr>
<tr>
<td>Mounting with screws</td>
<td>Screws with a diameter of 4 mm</td>
</tr>
<tr>
<td>Fastening torque</td>
<td>1.2 Nm</td>
</tr>
</tbody>
</table>

### 4.7 Approvals and certifications

Information on approvals and certificates can be found in the corresponding chapter of the *Main catalog, PLC Automation*.

### 5 System Data AC500-XC

Assembly, construction and connection of devices of the variant AC500-XC is identical to AC500 (standard). The following description provides information on general technical data of AC500-XC system.

### 5.1 Environmental Conditions

**Table 3: Process and Supply Voltages**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 VDC</td>
<td>24 V (-15 %, +20 %)</td>
</tr>
<tr>
<td>Voltage</td>
<td>24 V (-15 %, +20 %)</td>
</tr>
<tr>
<td>Protection against reverse polarity</td>
<td>Yes</td>
</tr>
<tr>
<td>120 VAC...240 VAC wide range supply</td>
<td>120...240 V (-15 %, +10 %)</td>
</tr>
<tr>
<td>Voltage</td>
<td>120...240 V (-15 %, +10 %)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz (-6 %, +4 %)</td>
</tr>
<tr>
<td>Allowed interruptions of power supply</td>
<td></td>
</tr>
<tr>
<td>DC supply</td>
<td>Interruption &lt; 10 ms, time between 2 interruptions &gt; 1 s, PS2</td>
</tr>
</tbody>
</table>

**NOTICE!**

Exceeding the maximum power supply voltage for process or supply voltages could lead to unrecoverable damage of the system. The system could be destroyed.
### NOTICE!

For the supply of the modules, power supply units according to PELV or SELV specifications must be used.

The creepage distances and clearances meet the requirements of the overvoltage category II, pollution degree 2.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>-40 °C...+70 °C</td>
</tr>
<tr>
<td></td>
<td>-40 °C...-30 °C: Proper start-up of system; technical data not guaranteed</td>
</tr>
<tr>
<td></td>
<td>-40 °C...0 °C: Due to the LCD technology, the display might respond very slowly.</td>
</tr>
<tr>
<td></td>
<td>-40 °C...+40 °C: Vertical mounting of modules possible, output load limited to 50 % per group</td>
</tr>
<tr>
<td></td>
<td>+60 °C...+70 °C with the following deratings:</td>
</tr>
<tr>
<td></td>
<td>- System is limited to max. 2 communication modules per terminal base</td>
</tr>
<tr>
<td></td>
<td>- Applications certified for cULus up to +60 °C</td>
</tr>
<tr>
<td></td>
<td>- Digital inputs: maximum number of simultaneously switched on input channels limited to 75 % per group (e.g. 8 channels =&gt; 6 channels)</td>
</tr>
<tr>
<td></td>
<td>- Digital outputs: output current maximum value (all channels together) limited to 75 % per group (e.g. 8 A =&gt; 6 A)</td>
</tr>
<tr>
<td></td>
<td>- Analog outputs only if configured as voltage output: maximum total output current per group is limited to 75 % (e.g. 40 mA =&gt; 30 mA)</td>
</tr>
<tr>
<td></td>
<td>- Analog outputs only if configured as current output: maximum number of simultaneously used output channels limited to 75 % per group (e.g. 4 channels =&gt; 3 channels)</td>
</tr>
<tr>
<td>Storage / Transport</td>
<td>-40 °C...+85 °C</td>
</tr>
<tr>
<td>Humidity</td>
<td>Operating / Storage: 100 % r. H. with condensation</td>
</tr>
<tr>
<td>Air pressure</td>
<td>Operating:</td>
</tr>
<tr>
<td></td>
<td>-1000 m...4000 m (1080 hPa...620 hPa)</td>
</tr>
<tr>
<td></td>
<td>&gt; 2000 m (&lt; 795 hPa):</td>
</tr>
<tr>
<td></td>
<td>- max. operating temperature must be reduced by 10 K (e.g. 70 °C to 60°C)</td>
</tr>
<tr>
<td></td>
<td>- I/O module relay contacts must be operated with 24 V nominal only</td>
</tr>
</tbody>
</table>
### Immunity to corrosive gases

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating:</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td>ISA S71.04.1985 Harsh group A, G3/GX</td>
<td></td>
</tr>
<tr>
<td>IEC 60721-3-3  3C2 / 3C3</td>
<td></td>
</tr>
</tbody>
</table>

### Immunity to salt mist

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating:</td>
<td>Yes, horizontal mounting only, according to IEC 60068-2-52 severity level: 1</td>
</tr>
</tbody>
</table>

**NOTICE!**

**Risk of corrosion!**

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices **TA535**.

---

**Table 4: Electromagnetic Compatibility**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device suitable for:</td>
<td></td>
</tr>
<tr>
<td>Industrial applications</td>
<td>Yes</td>
</tr>
<tr>
<td>Domestic applications</td>
<td>No</td>
</tr>
<tr>
<td>Radiated emission (radio disturbances)</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>CISPR 16-2-3</td>
</tr>
<tr>
<td>Conducted emission (radio disturbances)</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>CISPR 16-2-1, CISPR 16-1-2</td>
</tr>
<tr>
<td>Electrostatic discharge (ESD)</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-2, zone B, criterion B</td>
</tr>
<tr>
<td>Fast transient interference voltages (burst)</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-4, zone B, criterion B</td>
</tr>
<tr>
<td>High energy transient interference voltages (surge)</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-5, zone B, criterion B</td>
</tr>
<tr>
<td>Influence of radiated disturbances</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-3, zone B, criterion A</td>
</tr>
<tr>
<td>Influence of line-conducted interferences</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-6, zone B, criterion A</td>
</tr>
<tr>
<td>Influence of power frequency magnetic fields</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-8, zone B, criterion A</td>
</tr>
</tbody>
</table>
In order to prevent malfunctions, it is recommended, that the operating personnel discharge themselves prior to touching communication connectors or perform other suitable measures to reduce effects of electrostatic discharges.

NOTICE!
Risk of malfunctions!
- Unused slots for communication modules are not protected against accidental physical contact.
  - Unused slots for communication modules must be covered with dummy communication modules (TA524 to achieve IP20 rating.
  - I/O bus connectors must not be touched during operation.

5.2 Mechanical Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring method</td>
<td>Spring terminals</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 20</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>IEC 61131-2</td>
</tr>
<tr>
<td></td>
<td>IEC 60068-2-6</td>
</tr>
<tr>
<td></td>
<td>IEC 60068-2-64</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>IEC 60068-2-27</td>
</tr>
<tr>
<td>Assembly position</td>
<td>Horizontal</td>
</tr>
<tr>
<td></td>
<td>Vertical (no application in salt mist env)</td>
</tr>
<tr>
<td>Assembly on DIN rail</td>
<td>According to IEC 60715</td>
</tr>
<tr>
<td></td>
<td>35 mm, depth 7.5 mm or 15 mm</td>
</tr>
<tr>
<td>DIN rail type</td>
<td>According to IEC 60715</td>
</tr>
<tr>
<td>Assembly with screws</td>
<td></td>
</tr>
<tr>
<td>Screw diameter</td>
<td>4 mm</td>
</tr>
<tr>
<td>Fastening torque</td>
<td>1.2 Nm</td>
</tr>
</tbody>
</table>

5.3 Environmental Tests

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>IEC 60068-2-1 Test Ab: cold withstand test -40 °C / 16 h</td>
</tr>
<tr>
<td></td>
<td>IEC 60068-2-2 Test Bb: dry heat withstand test +85 °C / 16 h</td>
</tr>
<tr>
<td>Humidity</td>
<td>IEC 60068-2-30 Test Db: Cyclic (12 h / 12 h) damp-heat test 55 °C,</td>
</tr>
<tr>
<td></td>
<td>93 % r. H. / 25 °C, 95 % r. H., 6 cycles</td>
</tr>
<tr>
<td></td>
<td>IEC 60068-2-78, stationary humidity test: 40 °C, 93 % r. H., 240 h</td>
</tr>
<tr>
<td>Insulation Test</td>
<td>IEC 61131-2</td>
</tr>
</tbody>
</table>
### Environmental Tests

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibration resistance</td>
<td>IEC 61131-2 / IEC 60068-26: 5 Hz...500 Hz, 2 g (with SD memory card inserted)</td>
</tr>
<tr>
<td></td>
<td>IEC 60068-2-64: 5 Hz...500 Hz, 4 g rms</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>IEC 60068-2-27: all 3 axes 15 g, 11 ms, half-sinusoidal</td>
</tr>
</tbody>
</table>

**Table 5: EMC Immunity**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic discharge (ESD)</td>
<td>Electrostatic voltage in case of air discharge: 8 kV</td>
</tr>
<tr>
<td></td>
<td>Electrostatic voltage in case of contact discharge: 6 kV</td>
</tr>
<tr>
<td>Fast transient interference voltages (burst)</td>
<td>Supply voltage units (DC): 4 kV</td>
</tr>
<tr>
<td></td>
<td>Digital inputs/outputs (24 VDC): 2 kV</td>
</tr>
<tr>
<td></td>
<td>Analog inputs/outputs: 2 kV</td>
</tr>
<tr>
<td></td>
<td>Communication lines shielded: 2 kV</td>
</tr>
<tr>
<td></td>
<td>I/O supply (DC-out): 2 kV</td>
</tr>
<tr>
<td>High energy transient interference voltages (surge)</td>
<td>Supply voltage units (DC): 1 kV CM *) / 0.5 kV DM *)</td>
</tr>
<tr>
<td></td>
<td>Digital inputs/outputs (24 VDC): 1 kV CM *) / 0.5 kV DM *)</td>
</tr>
<tr>
<td></td>
<td>Digital inputs/outputs (AC): 4 kV</td>
</tr>
<tr>
<td></td>
<td>Analog inputs/outputs: 1 kV CM *) / 0.5 kV DM *)</td>
</tr>
<tr>
<td></td>
<td>Communication lines shielded: 1 kV CM *)</td>
</tr>
<tr>
<td></td>
<td>I/O supply (DC-out): 0.5 kV CM *) / 0.5 kV DM *)</td>
</tr>
<tr>
<td>Influence of radiated disturbances</td>
<td>Test field strength: 10 V/m</td>
</tr>
<tr>
<td>Influence of line-conducted interferences</td>
<td>Test voltage: 10 V</td>
</tr>
<tr>
<td>Power frequency magnetic fields</td>
<td>30 A/m 50 Hz</td>
</tr>
<tr>
<td></td>
<td>30 A/m 60 Hz</td>
</tr>
</tbody>
</table>

*) CM = Common Mode, * DM = Differential Mode