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 240 000 R0001</td>
<td>DI524, digital input module, 32 DI, 24 VDC, 1-wire</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 440 000 R0001</td>
<td>DI524-XC, digital input module, 32 DI, 24 VDC, 1-wire, XC version</td>
<td>Active</td>
</tr>
</tbody>
</table>

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

The dimensions are in mm and in brackets in inch.

3 Technical Data

The System Data of AC500 and S500 Chapter 4 “System Data AC500” on page 4 are valid for standard version.

The System Data of AC500-XC Chapter 5 “System Data AC500-XC” on page 8 are valid for the XC version.

Only additional details are therefore documented below.

The technical data are also valid for the XC version.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process supply voltage UP</td>
<td></td>
</tr>
<tr>
<td>Connections</td>
<td>Terminals 1.8, 2.8, 3.8 and 4.8 for +24 V (UP) as well as 1.9, 2.9, 3.9 and 4.9 for 0 V (ZP)</td>
</tr>
<tr>
<td>Rated value</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Max. ripple</td>
<td>5 %</td>
</tr>
<tr>
<td>Protection against reversed voltage</td>
<td>Yes</td>
</tr>
<tr>
<td>Rated protection fuse for UP</td>
<td>10 A fast</td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>Yes, per module</td>
</tr>
</tbody>
</table>
### Technical Data of the Digital Inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
<td><strong>Value</strong></td>
</tr>
<tr>
<td><strong>Current consumption</strong></td>
<td></td>
</tr>
<tr>
<td>From 24 VDC power supply at the terminals UP/L+ and ZP/M of the CPU/bus module</td>
<td>ca. 2 mA</td>
</tr>
<tr>
<td>From UP at normal operation</td>
<td>0.15 A</td>
</tr>
<tr>
<td>Inrush current from UP (at power up)</td>
<td>0.008 A(\text{s})</td>
</tr>
<tr>
<td>Weight (without terminal unit)</td>
<td>ca. 105 g</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Horizontal or vertical with derating (output load reduced to 50 % at 40 °C per group)</td>
</tr>
<tr>
<td>Cooling</td>
<td>The natural convection cooling must not be hindered by cable ducts or other parts in the switchgear cabinet.</td>
</tr>
</tbody>
</table>

**NOTICE!**

**Attention:**

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply, short circuit and continuous overvoltage up to 30 VDC.

### 3.1 Technical Data of the Digital Inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
<td><strong>Value</strong></td>
</tr>
<tr>
<td>Number of channels per module</td>
<td>32</td>
</tr>
<tr>
<td>Distribution of the channels into groups</td>
<td>1 group of 32 channels</td>
</tr>
<tr>
<td>Terminals of the channels I0 to I7</td>
<td>1.0 to 1.7</td>
</tr>
<tr>
<td>Terminals of the channels I8 to I15</td>
<td>2.0 to 2.7</td>
</tr>
<tr>
<td>Terminals of the channels I16 to I23</td>
<td>3.0 to 3.7</td>
</tr>
<tr>
<td>Terminals of the channels I24 to I31</td>
<td>4.0 to 4.7</td>
</tr>
<tr>
<td>Reference potential for all inputs</td>
<td>Terminals 1.9, 2.9, 3.9 and 4.9 (negative pole of the process supply voltage, signal name ZP)</td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>From the rest of the module (I/O bus)</td>
</tr>
<tr>
<td>Indication of the input signals</td>
<td>One yellow LED per channel, the LED is ON when the input signal is high (signal 1)</td>
</tr>
<tr>
<td>Monitoring point of input indicator</td>
<td>LED is part of the input circuitry</td>
</tr>
<tr>
<td>Input type acc. to EN 61131-2</td>
<td>Type 1</td>
</tr>
<tr>
<td>Input delay (0 -&gt; 1 or 1 -&gt; 0)</td>
<td>Typ. 8 ms, configurable from 0.1 to 32 ms</td>
</tr>
<tr>
<td>Input signal voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Signal 0</td>
<td>-3 V...+5 V</td>
</tr>
<tr>
<td>Undefined signal</td>
<td>&gt; +5 V...&lt; +15 V</td>
</tr>
<tr>
<td>Signal 1</td>
<td>+15 V...+30 V</td>
</tr>
<tr>
<td>Ripple with signal 0</td>
<td>Within -3 V...+5 V</td>
</tr>
<tr>
<td>Ripple with signal 1</td>
<td>Within +15 V...+30 V</td>
</tr>
<tr>
<td>Input current per channel</td>
<td></td>
</tr>
<tr>
<td>Input voltage +24 V</td>
<td>Typ. 5 mA</td>
</tr>
</tbody>
</table>
### 3.2 Technical Data of the Fast Counter

*The fast counter of the module does not work if the module is connected to a*
- FBP interface module
- CS31 bus module
- CANopen bus module

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage +5 V</td>
<td>&gt; 1 mA</td>
</tr>
<tr>
<td>Input voltage +15 V</td>
<td>&gt; 5 mA</td>
</tr>
<tr>
<td>Input voltage +30 V</td>
<td>&lt; 8 mA</td>
</tr>
<tr>
<td>Max. cable length</td>
<td></td>
</tr>
<tr>
<td>Shielded</td>
<td>1000 m</td>
</tr>
<tr>
<td>Unshielded</td>
<td>600 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used inputs</td>
<td>I24 / I25</td>
</tr>
<tr>
<td>Used outputs</td>
<td>None</td>
</tr>
<tr>
<td>Counting frequency</td>
<td>Max. 50 kHz</td>
</tr>
<tr>
<td>Detailed description</td>
<td>See Fast Counter</td>
</tr>
<tr>
<td>Operating modes</td>
<td>See Operating modes</td>
</tr>
</tbody>
</table>

### 4 System Data AC500
#### 4.1 Environmental Conditions

*Table 1: 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>
<tr>
<td>Allowed interruptions of power supply, according to EN 61131-2</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Value</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>DC supply</td>
<td>Interruption &lt; 10 ms, time between 2 interruptions &gt; 1 s, PS2</td>
</tr>
<tr>
<td>AC supply</td>
<td>Interruption &lt; 0.5 periods, time between 2 interruptions &gt; 1 s</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!**
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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>1.2/50 µs</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 V circuits against other circuitry</td>
<td>2500 V</td>
<td>1.2/50 µs</td>
</tr>
<tr>
<td>120 V circuits against other circuitry</td>
<td>1500 V</td>
<td>1.2/50 µs</td>
</tr>
<tr>
<td>120 V...240 V circuits against other circuitry</td>
<td>2500 V</td>
<td>1.2/50 µs</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>
<td>1.2/50 µs</td>
</tr>
<tr>
<td>COM interfaces, electrically isolated</td>
<td>500 V</td>
<td>1.2/50 µs</td>
</tr>
<tr>
<td>COM interfaces, electrically not isolated</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>FBP interface</td>
<td>500 V</td>
<td>1.2/50 µs</td>
</tr>
<tr>
<td>Ethernet</td>
<td>500 V</td>
<td>1.2/50 µs</td>
</tr>
<tr>
<td>ARCNET</td>
<td>500 V</td>
<td>1.2/50 µs</td>
</tr>
<tr>
<td>230 V circuits against other circuitry</td>
<td>1350 V</td>
<td>AC 2 s</td>
</tr>
<tr>
<td>120 V circuits against other circuitry</td>
<td>820 V</td>
<td>AC 2 s</td>
</tr>
<tr>
<td>120 V...240 V circuits against other circuitry</td>
<td>1350 V</td>
<td>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</td>
<td>AC 2 s</td>
</tr>
<tr>
<td>COM interfaces, electrically isolated</td>
<td>350 V</td>
<td>AC 2 s</td>
</tr>
<tr>
<td>COM interfaces, electrically not isolated</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>FBP interface</td>
<td>350 V</td>
<td>AC 2 s</td>
</tr>
<tr>
<td>Ethernet</td>
<td>350 V</td>
<td>AC 2 s</td>
</tr>
<tr>
<td>ARCNET</td>
<td>350 V</td>
<td>AC 2 s</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

#### Electromagnetic Compatibility

<table>
<thead>
<tr>
<th>Device suitable for:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial applications</td>
<td>Yes</td>
</tr>
<tr>
<td>Domestic applications</td>
<td>No</td>
</tr>
</tbody>
</table>

#### 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 |

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.

#### Immunity against the influence of radiated (CW radiated):

According to IEC 61000-4-3, zone B, criterion A

| Test field strength | 10 V/m |

#### Immunity against fast transient interference voltages (burst):

According to IEC 61000-4-4, zone B, criterion B

| Supply voltage units (DC) | 2 kV |
| Supply voltage units (AC) | 2 kV |
| Digital inputs/outputs (24 VDC) | 1 kV |
| Digital inputs/outputs (120 VAC...240 VAC) | 2 kV |
| Analog inputs/outputs | 1 kV |
| CS31 system bus | 1 kV |
| Serial RS-485 interfaces (COM) | 1 kV |
| Serial RS-232 interfaces (COM, not for PM55x and PM56x) | 1 kV |
| ARCNET | 1 kV |
| FBP | 1 kV |
| Ethernet | 1 kV |
| I/O supply (DC-out) | 1 kV |

#### Immunity against the influence of line-conducted interferences (CW conducted):

According to IEC 61000-4-6, zone B, criterion A

| Test voltage | 3V zone B, 10 V is also met. |

#### High energy surges

According to IEC 61000-4-5, zone B, criterion B

| Power supply DC | 1 kV CM / 0.5 kV DM |
| DC I/O supply | 0.5 kV CM / 0.5 kV DM |
### Electromagnetic Compatibility

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Lines, shielded</td>
<td>1 kV CM ¹)</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>
<tr>
<td>Radiation (radio disturbance)</td>
<td>According to IEC 55011, group 1, class A</td>
</tr>
</tbody>
</table>

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>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>
<tr>
<td>Mounting of the modules:</td>
<td></td>
</tr>
<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 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...240 VAC wide range supply</td>
<td></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.
### Environmental Conditions

<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><strong>Storage / Transport</strong></td>
<td>-40 °C...+85 °C</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>Operating / Storage: 100 % r. H. with condensation</td>
</tr>
<tr>
<td><strong>Air pressure</strong></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>
<tr>
<td><strong>Immunity to corrosive gases</strong></td>
<td>Operating: Yes, according to:</td>
</tr>
<tr>
<td></td>
<td>ISA S71.04.1985 Harsh group A, G3/GX</td>
</tr>
<tr>
<td></td>
<td>IEC 60721-3-3 3C2 / 3C3</td>
</tr>
<tr>
<td><strong>Immunity to salt mist</strong></td>
<td>Operating: 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 3: 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 environment)</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></td>
<td>35 mm, depth 7.5 mm or 15 mm</td>
</tr>
<tr>
<td>Assembly with screws</td>
<td>4 mm</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>
<tr>
<td>Vibration resistance</td>
<td>IEC 61131-2 / IEC 60068-26: 5 Hz...500 Hz, 2 g (with SD memory</td>
</tr>
<tr>
<td></td>
<td>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 4: 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</td>
<td>Supply voltage units (DC): 4 kV</td>
</tr>
<tr>
<td>(burst)</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>Parameter</td>
<td>Value</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>----------------------------------------------------------------------</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