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 221 500 R0001</td>
<td>CI506-PNIO, PROFINET bus module with 2 serial interfaces and 1 CANopen master interface</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 421 500 R0001</td>
<td>CI506-PNIO-XC, PROFINET bus module with 2 serial interfaces and 1 CANopen master interface, 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 \cite{4} Chapter 4 “System Data AC500” on page 5 are valid for standard version.

The System Data of AC500-XC \cite{5} Chapter 5 “System Data AC500-XC” on page 9 are valid for the XC version.

Only additional details are therefore documented below.

3.1 Technical Data of the Module

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process supply voltages UP</td>
<td></td>
</tr>
<tr>
<td>Rated value</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Max. load for the terminals</td>
<td>10 A</td>
</tr>
<tr>
<td>Protection against reversed voltage</td>
<td>Yes</td>
</tr>
<tr>
<td>Rated protection fuse on UP</td>
<td>10 A fast</td>
</tr>
<tr>
<td>Inrush current from UP (at power up)</td>
<td>On request</td>
</tr>
<tr>
<td>Parameter</td>
<td>Value</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Current consumption via UP (normal operation)</td>
<td>0.15 A</td>
</tr>
<tr>
<td>Connections</td>
<td>Terminals 1.0, 2.0 and 3.0 for +24 V (UP)</td>
</tr>
<tr>
<td>Input data length</td>
<td>0...36 bytes</td>
</tr>
<tr>
<td>Output data length</td>
<td>0...36 bytes</td>
</tr>
<tr>
<td>Max. power dissipation within the module</td>
<td>5 W</td>
</tr>
<tr>
<td>Setting of the I/O device identifier</td>
<td>With 2 rotary switches at the front side of the module</td>
</tr>
<tr>
<td>Operation and error displays</td>
<td>18 LEDs (total)</td>
</tr>
<tr>
<td>Weight (without terminal unit)</td>
<td>ca. 125 g</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Horizontal or vertical</td>
</tr>
<tr>
<td>Cooling</td>
<td>The natural convection cooling must not be hindered by cable ducts or other parts in the switch-gear cabinet.</td>
</tr>
</tbody>
</table>

| Electrical isolation                           | Ethernet interface against the rest of the module, each serial and CAN port against each other and the rest of the module |
| Diagnosis                                      | See Diagnosis                                                        |

**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.

**Multiple overloads**

No effects of multiple overloads on isolated multi-channel modules occur, as every channel is protected individually by an internal smart high-side switch.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus connection</td>
<td>2 x RJ45</td>
</tr>
<tr>
<td>Switch</td>
<td>Integrated</td>
</tr>
<tr>
<td>Technology</td>
<td>Hilscher netX100</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>10/100 Mbit/s (full-duplex)</td>
</tr>
<tr>
<td>Transfer method</td>
<td>According to Ethernet II, IEE802.3</td>
</tr>
<tr>
<td>Ethernet</td>
<td>100 base-TX, internal switch, 2x RJ45 socket</td>
</tr>
<tr>
<td>Expandability</td>
<td>Max. 10 S500 I/O modules</td>
</tr>
<tr>
<td>Adjusting elements</td>
<td>2 rotary switches for generation of an explicit name</td>
</tr>
</tbody>
</table>
### 3.2 Technical Data of the Serial Interfaces

<table>
<thead>
<tr>
<th><strong>Parameter</strong></th>
<th><strong>Value</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of serial interfaces</td>
<td>2</td>
</tr>
<tr>
<td>Connectors for serial interfaces</td>
<td>X11 for COM1, X12 for COM2</td>
</tr>
<tr>
<td>Supported physical layers</td>
<td>RS-232, RS-422, RS-485</td>
</tr>
<tr>
<td>Supported protocols</td>
<td>ASCII</td>
</tr>
<tr>
<td>Baudrate</td>
<td>Configurable from 300 bit/s to 115,200 bit/s</td>
</tr>
</tbody>
</table>

### 3.3 Technical Data of the CANopen Interface

<table>
<thead>
<tr>
<th><strong>Parameter</strong></th>
<th><strong>Value</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of CANopen interfaces</td>
<td>1</td>
</tr>
<tr>
<td>Connector for CANopen Interface</td>
<td>X13</td>
</tr>
<tr>
<td>Baudrate</td>
<td>Up to 1 Mbit/s</td>
</tr>
</tbody>
</table>

*) Priorization with the aid of VLAN-ID including priority level
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>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC supply</td>
<td>Interruption &lt; 10 ms, time between 2 interuptions &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>
</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>
<tr>
<td>230 V circuits against other circuitry</td>
<td>1350 V</td>
</tr>
<tr>
<td>120 V circuits against other circuitry</td>
<td>820 V</td>
</tr>
<tr>
<td>120 V...240 V circuits against other circuitry</td>
<td>1350 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>350 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>COM interfaces, electrically isolated</td>
<td>350 V AC 2 s</td>
</tr>
<tr>
<td>COM interfaces, electrically not isolated</td>
<td>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**

<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):**

- 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
Electromagnetic Compatibility

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<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>

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

- According to IEC 61000-4-6, zone B, criterion A
- Test voltage: 3 V 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
- Communication Lines, shielded: 1 kV CM
- AC I/O unshielded: 2 kV CM / 1 kV DM
- I/O analog, I/O DC unshielded: 1 kV CM / 0.5 kV DM
- 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>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>Parameter</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 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>
</tbody>
</table>

Allowed interruptions of power supply

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

**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><strong>Operating</strong></td>
</tr>
<tr>
<td></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><strong>Operating</strong> -40 °C...+85 °C</td>
</tr>
<tr>
<td></td>
<td><strong>Humidity</strong> Operating / Storage: 100 % r. H. with condensation</td>
</tr>
<tr>
<td><strong>Air pressure</strong></td>
<td><strong>Operating:</strong></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 card</td>
</tr>
<tr>
<td></td>
<td>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 (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>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