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 130 200 R0200</td>
<td>PM572, processor module, memory 128 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 130 300 R0271</td>
<td>PM573-ETH, processor module, memory 512 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 330 300 R0271</td>
<td>PM573-ETH-XC, processor module, memory 512 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols, XC version</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 140 200 R0201</td>
<td>PM582, processor module, memory 512 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display</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 340 200 R0201</td>
<td>PM582-XC, processor module, memory 512 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, XC version</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 140 300 R0271</td>
<td>PM583-ETH, processor module, memory 1024 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 340 300 R0271</td>
<td>PM583-ETH-XC, processor module, memory 1024 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols, XC version</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 140 500 R0271</td>
<td>PM585-ETH, processor module, memory 1024 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 150 000 R0261</td>
<td>PM590-ARCNET, processor module, memory 2 MB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, integrated communication module ARCNET</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 150 000 R0271</td>
<td>PM590-ETH, processor module, memory 2 MB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 150 100 R0271</td>
<td>PM591-ETH, processor module, memory 4 MB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 150 100 R0277</td>
<td>PM591-2ETH, processor module, memory 4 MB, 24 V DC, memory card slot, interfaces 1 RS-232/485 (programming, Modbus/CS31), display, 2 onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 350 100 R0271</td>
<td>PM591-ETH-XC, processor module, memory 4 MB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols, XC version</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 150 200 R0271</td>
<td>PM592-ETH, processor module, memory 4 MB / 4 GB flash disk, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols</td>
<td>Active</td>
</tr>
<tr>
<td>1SAP 350 200 R0271</td>
<td>PM592-ETH-XC, processor module, memory 4 MB / 4 GB flash disk, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols, XC version</td>
<td>Active</td>
</tr>
</tbody>
</table>

*) Modules in lifecycle Classic are available from stock but not recommended for planning and commissioning of new installations.

## 2 Dimensions

![Dimensions Diagram]

1. Din rail 15 mm
2. Din rail 7.5 mm
3 Technical data

The system data of AC500 and S500 \(\text{Chapter 4 “System data AC500” on page 11}\) are applicable to the standard version.

The system data of AC500-XC \(\text{Chapter 5 “System data AC500-XC” on page 15}\) are applicable to the XC version.

Only additional details are therefore documented below. The technical data are also applicable to the XC version.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection of the supply voltage 24 V DC at the terminal base of the processor module</td>
<td>Removable 5-pin terminal block with spring connection</td>
</tr>
<tr>
<td>Current consumption from 24 V DC</td>
<td>PM57x: 50 mA</td>
</tr>
<tr>
<td></td>
<td>PM57x-ETH: 110 mA</td>
</tr>
<tr>
<td></td>
<td>PM58x: 50 mA</td>
</tr>
<tr>
<td></td>
<td>PM58x-ETH: 110 mA</td>
</tr>
<tr>
<td></td>
<td>PM58x-ARCNET: 110 mA</td>
</tr>
<tr>
<td></td>
<td>PM59x: 90 mA</td>
</tr>
<tr>
<td></td>
<td>PM59x-ETH: 150 mA</td>
</tr>
<tr>
<td></td>
<td>PM59x-2ETH: 150 mA</td>
</tr>
<tr>
<td></td>
<td>PM59x-ARCNET: 150 mA</td>
</tr>
<tr>
<td>Slots on the terminal bases</td>
<td>TB511: 1 processor module, 1 communication module</td>
</tr>
<tr>
<td></td>
<td>TB521: 1 processor module, 2 communication modules</td>
</tr>
<tr>
<td></td>
<td>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 the terminal bases TB5x1</td>
<td>I/O bus, COM1, COM2, FBP</td>
</tr>
<tr>
<td>Processor module interfaces at the terminal bases TB5x3</td>
<td>I/O bus, COM1</td>
</tr>
<tr>
<td>Processor module network interfaces at the terminal bases</td>
<td>TB5x1-ETH / AC500 CPU with Ethernet interface</td>
</tr>
<tr>
<td></td>
<td>TB5x3-ETH / AC500CPU with two Ethernet interfaces</td>
</tr>
<tr>
<td></td>
<td>TB5x1-ARCNET / AC500 CPU with ARCNET</td>
</tr>
<tr>
<td>Connection system</td>
<td>See</td>
</tr>
<tr>
<td>Weight (processor module without terminal base)</td>
<td>PM582: 135 g</td>
</tr>
<tr>
<td></td>
<td>PM58x-ETH: 150 g</td>
</tr>
</tbody>
</table>
### Detailed data

**Table 1: PM57x**

<table>
<thead>
<tr>
<th>Processor Module</th>
<th>PM572</th>
<th>PM573-ETH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program memory flash EPROM and RAM</td>
<td>128 kB</td>
<td>512 kB</td>
</tr>
<tr>
<td>Data memory, integrated</td>
<td>128 kB, incl. 12 kB buffered</td>
<td>512 kB, incl. 288 kB buffered</td>
</tr>
<tr>
<td>Expandable memory</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Integrated mass storage memory</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Pluggable memory card for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User data storage</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Program storage</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Firmware update</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Cycle time for 1 instruction:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binary</td>
<td>Min. 0.06 µs</td>
<td>Min. 0.06 µs</td>
</tr>
<tr>
<td>Word</td>
<td>Min. 0.09 µs</td>
<td>Min. 0.09 µs</td>
</tr>
<tr>
<td>Floating point</td>
<td>Min. 0.70 µs</td>
<td>Min. 0.70 µs</td>
</tr>
<tr>
<td>Max. number of central inputs and outputs (up to 7 exp. modules): (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs</td>
<td>224</td>
<td>224</td>
</tr>
<tr>
<td>Digital outputs</td>
<td>224</td>
<td>224</td>
</tr>
<tr>
<td>Analog inputs</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Analog outputs</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Max. number of central inputs and outputs (10 exp. modules):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td>Digital outputs</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td>Analog inputs</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>Analog outputs</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>Number of decentralized inputs and outputs</td>
<td>Depends on the fieldbus used (as an info on the CS31 bus: up to 31 stations with up to 120 DI / 120 DO each)</td>
<td></td>
</tr>
<tr>
<td>Data backup</td>
<td>Battery</td>
<td></td>
</tr>
<tr>
<td>Data buffering time at 25 °C</td>
<td>Typ. 3 years without power supply</td>
<td></td>
</tr>
<tr>
<td>Battery low indication</td>
<td>Warning issued about 2 weeks before the state of charge becomes critical</td>
<td></td>
</tr>
<tr>
<td>Real-time clock:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With battery backup</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Processor Module</td>
<td>PM572</td>
<td>PM573-ETH</td>
</tr>
<tr>
<td>------------------</td>
<td>-------</td>
<td>-----------</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>Typ. ± 2 s / day at 25 °C</td>
<td></td>
</tr>
<tr>
<td><strong>Program execution:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclic</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Time-controlled</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Multitasking</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Protection of the user program by a password</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Serial interface COM1:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical link</td>
<td>Configurable for RS-232 or RS-485 (from 0.3 to 187.5 kB/s) pluggable terminal block, spring connection for programming, as Modbus (master/slave), as serial ASCI communication, as CS31 Master</td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Serial interface COM2 (not for PM5xy-2ETH models):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical link</td>
<td>Configurable for RS-232 or RS-485 (from 0.3 to 187.5 kB/s) D-sub for programming, as Modbus (master/slave), as serial ASCII communication</td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Integrated communication module:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETH = Ethernet</td>
<td>-</td>
<td>ETH onboard with web server, SNTP and IEC60870-5-104 protocol</td>
</tr>
<tr>
<td>RJ45</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>ARCNET = ARCNET BNC</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Number of external communication modules</strong></td>
<td>Up to 4 communication modules like PROFIBUS DP, Ethernet, CANopen. There are no restrictions concerning the communication module types and communication module combinations (e.g. up to 4 PROFIBUS DP communication modules are possible)</td>
<td></td>
</tr>
<tr>
<td><strong>Ethernet</strong></td>
<td>-</td>
<td>10/100 base-TX, 1x RJ45 socket, provided on TB5x1-ETH</td>
</tr>
<tr>
<td><strong>LEDs, LCD display, 8 function keys</strong></td>
<td>For RUN/STOP switchover, status displays and diagnosis</td>
<td></td>
</tr>
<tr>
<td><strong>Number of timers</strong></td>
<td>Unlimited</td>
<td></td>
</tr>
<tr>
<td><strong>Number of counters</strong></td>
<td>Unlimited</td>
<td></td>
</tr>
<tr>
<td><strong>Programming languages:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structured Text ST</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Instruction List IL</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Function Block Diagram FBD</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Ladder Diagram LD</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Sequential Function Chart SFC</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Continuous Function Chart CFC</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

1): up to 7 I/O terminal units before PS501 V1.2 and processor module firmware before V1.2.0.
Table 2: PM58x

<table>
<thead>
<tr>
<th>Processor Module</th>
<th>PM582</th>
<th>PM583-ETH</th>
<th>PM585-ETH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program memory flash EPROM and RAM</td>
<td>512 kB</td>
<td>1024 kB</td>
<td>1024 kB</td>
</tr>
<tr>
<td>Data memory, integrated</td>
<td>416 kB, incl. 288 kB buffered</td>
<td>1024 kB, incl. 288 kB buffered</td>
<td>1536 kB, incl. 512 kB buffered</td>
</tr>
<tr>
<td>Expandable memory</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Integrated mass storage memory</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Pluggable memory card for:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User data storage</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Program storage</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Firmware update</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Cycle time for 1 instruction:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binary</td>
<td>Min. 0.05 µs</td>
<td>Min. 0.004 µs</td>
<td></td>
</tr>
<tr>
<td>Word</td>
<td>Min. 0.06 µs</td>
<td>Min. 0.008 µs</td>
<td></td>
</tr>
<tr>
<td>Floating point</td>
<td>Min. 0.50 µs</td>
<td>Min. 0.008 µs</td>
<td></td>
</tr>
<tr>
<td>Max. number of central inputs and outputs (up to 7 exp. modules): 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs</td>
<td>224</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital outputs</td>
<td>224</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog inputs</td>
<td>112</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog outputs</td>
<td>112</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. number of central inputs and outputs (10 exp. modules):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs</td>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital outputs</td>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog inputs</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog outputs</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of decentralized inputs and outputs (as an info on the CS31 bus: up to 31 stations with up to 120 DI / 120 DO each)</td>
<td>Depends on the fieldbus used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data backup</td>
<td>Battery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data buffering time at 25 °C</td>
<td>Typ. 3 years without power supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery low indication</td>
<td>Warning issued about 2 weeks before the state of charge becomes critical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real-time clock:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With battery backup</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>Typ. ±2 s / day at 25 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program execution:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclic</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time-controlled</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multitasking</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection of the user program by a password</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serial interface COM1:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Processor Module

<table>
<thead>
<tr>
<th>Physical link</th>
<th>Configurable for RS-232 or RS-485 (from 0.3 to 187.5 kB/s) pluggable terminal block, spring connection for programming, as Modbus (master/slave), as serial ASCII communication, as CS31 master</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td></td>
</tr>
</tbody>
</table>

**Serial interface COM2 (not for PM5xy-2ETH models):**

<table>
<thead>
<tr>
<th>Physical link</th>
<th>Configurable for RS-232 or RS-485 (from 0.3 to 187.5 kB/s) D-sub for programming, as Modbus (master/slave), as serial ASCII communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td></td>
</tr>
</tbody>
</table>

**Integrated communication module:**

<table>
<thead>
<tr>
<th>ETH = Ethernet</th>
<th>ETH onboard with web server, SNTP and IEC60870-5-104 protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>RJ45</td>
<td>Up to 4 communication modules like PROFINET, Ethernet, CANopen. There are no restrictions concerning the communication module types and communication module combinations (e.g. up to 4 PROFINET communication modules are possible)</td>
</tr>
<tr>
<td>ARCNET = ARCNET BNC</td>
<td>-</td>
</tr>
</tbody>
</table>

**Number of external communication modules**

- 10/100 base-TX, 1x RJ45 socket, provided on TB5x1-ETH
- For RUN/STOP switchover, status displays and diagnosis
- Unlimited
- Unlimited

**Programming languages:**

- Structured Text ST  
- Instruction List IL  
- Function Block Diagram FBD  
- Ladder Diagram LD  
- Sequential Function Chart SFC  
- Continuous Function Chart (CFC)

1): up to 7 I/O terminal units before PS501 V1.2 and processor module firmware before V1.2.0.

### Table 3: PM59x

<table>
<thead>
<tr>
<th>Processor Module</th>
<th>PM59x-ETH</th>
<th>PM59x-ARCNET</th>
<th>PM59x-ETH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program memory flash EPROM and RAM</td>
<td>PM590: 2048 kB, PM591/PM592: 4096 kB</td>
<td></td>
<td>PM590: 3072 kB, PM591/592: 5632 kB, incl. 1536 kB buffered</td>
</tr>
<tr>
<td>Data memory, integrated</td>
<td>PM590: 2560 kB, PM591: 3584 kB, incl. 1536 kB buffered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processor Module</td>
<td>PM59x-ETH</td>
<td>PM59x-ARCNET</td>
<td>PM59x-ETH</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------</td>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Expandable memory</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Integrated mass storage memory</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Pluggable memory card for:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User data storage</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Program storage</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Firmware update</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Cycle time for 1 instruction:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binary</td>
<td>Min. 0.002 µs</td>
<td>Min. 0.002 µs</td>
<td>Min. 0.002 µs</td>
</tr>
<tr>
<td>Word</td>
<td>Min. 0.004 µs</td>
<td>Min. 0.004 µs</td>
<td>Min. 0.004 µs</td>
</tr>
<tr>
<td>Floating point</td>
<td>Min. 0.004 µs</td>
<td>Min. 0.004 µs</td>
<td>Min. 0.004 µs</td>
</tr>
<tr>
<td>Max. number of central inputs and outputs (up to 7 exp. modules): ¹)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs</td>
<td>224</td>
<td>224</td>
<td>224</td>
</tr>
<tr>
<td>Digital outputs</td>
<td>224</td>
<td>224</td>
<td>224</td>
</tr>
<tr>
<td>Analog inputs</td>
<td>112</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Analog outputs</td>
<td>112</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td>Max. number of central inputs and outputs (10 exp. modules):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs</td>
<td>320</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td>Digital outputs</td>
<td>320</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td>Analog inputs</td>
<td>160</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>Analog outputs</td>
<td>160</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>Number of decentralized inputs and outputs</td>
<td>Depends on the fieldbus used (as an info on the CS31 bus: up to 31 stations with up to 120 DI / 120 DO each)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data backup</td>
<td>Battery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data buffering time at 25 °C</td>
<td>Typ. 3 years without power supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery low indication</td>
<td>Warning issued about 2 weeks before the state of charge becomes critical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real-time clock:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With battery backup</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Typ. ±2 s / day at 25 °C</td>
<td>Typ. ±2 s / day at 25 °C</td>
<td>Typ. ±2 s / day at 25 °C</td>
</tr>
<tr>
<td>Program execution:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclic</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Time-controlled</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Multitasking</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Password protection of user program</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Serial interface COM1:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical link</td>
<td>Configurable for RS-232 or RS-485 (from 0.3 to 187.5 kB/s) pluggable terminal block, spring connection for programming, as Modbus (master/slave), as serial ASCII communication, as CS31 master</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processor Module</td>
<td>PM59x-ETH</td>
<td>PM59x-ARCNET</td>
<td>PM59x-ETH</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Serial interface COM2 (not for PM5xy-2ETH models):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical link</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configurable for RS-232 or RS-485 (from 0.3 to 187.5 kB/s) D-sub for programming, as Modbus (master/slave), as serial ASCII communication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated communication module:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETH = Ethernet</td>
<td>ETH</td>
<td>ARCNET</td>
<td>ETH</td>
</tr>
<tr>
<td>RJ45</td>
<td>ETH</td>
<td>ARCNET</td>
<td></td>
</tr>
<tr>
<td>ARCNET = ARCNET BNC</td>
<td>ETH</td>
<td>ARCNET</td>
<td>ETH onboard with web server, SNTP and IEC60870-5-104 protocol</td>
</tr>
<tr>
<td>Number of external communication modules</td>
<td>Up to 4 communication modules like PROFIBUS DP, Ethernet, CANopen. There are no restrictions concerning the communication module types and communication module combinations (e.g. up to 4 PROFIBUS DP communication modules are possible)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethernet</td>
<td>10/100 base-TX, 1x RJ45 socket</td>
<td>-</td>
<td>PM59x-ETH: 10/100 base-TX, 1x RJ45 socket, provided on TB5x1-ETH</td>
</tr>
<tr>
<td>PM591-2ETH</td>
<td>-</td>
<td>PM59x-ETH: 10/100 base-TX, independent interfaces, 2x RJ45 socket, provided on TB521-2ETH</td>
<td></td>
</tr>
<tr>
<td>LEDs, LCD display, 8 Function Keys</td>
<td>For RUN/STOP switchover, status displays and diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of timers</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Number of counters</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Programming languages:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structured Text ST</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Instruction List IL</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Function Block Diagram FBD</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Ladder Diagram LD</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Sequential Function Chart SFC</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Continuous Function Chart (CFC)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

1): up to 7 I/O terminal units before PS501 V1.2 and processor module firmware before V1.2.0.
2): For PM595 see device description for PM595.
## 4 System data AC500

### 4.1 Environmental conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table 4: Process and supply voltages</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Parameter</strong></td>
<td><strong>Value</strong></td>
</tr>
<tr>
<td>24 V DC</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 V AC</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 V AC</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>230 V AC (-15 %, +10 %)</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz (-6 %, +4 %)</td>
</tr>
<tr>
<td>120 V AC...240 V AC 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>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 might 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><strong>Temperature</strong></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>Parameter</td>
<td>Value</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------------------------</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>24 V circuits against other circuitry</td>
<td>500 V</td>
</tr>
<tr>
<td>COM interfaces, galvanically 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>24 V circuits against other circuitry</td>
<td>350 V</td>
</tr>
<tr>
<td>24 V circuits 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 SELV or PELV specifications must be used.

**Safety Extra Low Voltage (SELV) and Protective Extra Low Voltage (PELV)**

To ensure electrical safety of AC500/AC500-eCo extra low voltage circuits, 24 V DC supply, communication interfaces, I/O circuits, and all connected devices must be powered from sources meeting requirements of SELV, PELV, class 2, limited voltage or limited power according to applicable standards.

**WARNING!**

Improper installation can lead to death by touching hazardous voltages!

To avoid personal injury, safe separation, double or reinforced insulation and separation of the primary and secondary circuit must be observed and implemented during installation.

- Only use power converters for safety extra-low voltages (SELV) with safe galvanic separation of the primary and secondary circuit.
- Safe separation means that the primary circuit of mains transformers must be separated from the secondary circuit by double or reinforced insulation. The protective extra-low voltage (PELV) offers protection against electric shock.

### 4.5 Electromagnetic compatibility

**Table 5: Range of use**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial applications</td>
<td>Yes</td>
</tr>
<tr>
<td>Domestic applications</td>
<td>No</td>
</tr>
</tbody>
</table>

**Table 6: Immunity against electrostatic discharge (ESD), according to IEC 61000-4-2, zone B, criterion B**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic voltage in case of air discharge</td>
<td>8 kV</td>
</tr>
<tr>
<td>Electrostatic voltage in case of contact discharge</td>
<td>4 kV, in a closed switchgear cabinet 6 kV ¹)</td>
</tr>
</tbody>
</table>
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.

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.

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

### Table 7: Immunity against the influence of radiated (CW radiated), according to IEC 61000-4-3, zone B, criterion A

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test field strength</td>
<td>10 V/m</td>
</tr>
</tbody>
</table>

### Table 8: Immunity against fast transient interference voltages (burst), according to IEC 61000-4-4, zone B, criterion B

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</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 V DC)</td>
<td>1 kV</td>
</tr>
<tr>
<td>Digital inputs/outputs (120 V AC...240 V AC)</td>
<td>2 kV</td>
</tr>
<tr>
<td>Analog inputs/outputs</td>
<td>1 kV</td>
</tr>
<tr>
<td>CS31 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>ARCCNET</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 9: Immunity against the influence of line-conducted interferences (CW conducted), according to IEC 61000-4-6, zone B, criterion A

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test voltage</td>
<td>3 V 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 ³)</td>
<td>2 kV CM / 1 kV DM ¹)</td>
</tr>
</tbody>
</table>
### Table 10: Process and supply voltages

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>24 V (-15 %, +20 %)</td>
</tr>
</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection against reverse polarity</td>
<td>Yes</td>
</tr>
<tr>
<td>120 V AC...240 V AC 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 might 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>
<th>Explication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>-40 °C...+70 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-40 °C...-30 °C: Proper start-up of system; technical data not guaranteed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-40 °C...0 °C: Due to the LCD technology, the display might respond very slowly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-40 °C...+40 °C: Vertical mounting of modules possible, output load limited to 50 % per group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>+60 °C...+70 °C with the following deratings:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● System is limited to max. 2 communication modules per terminal base</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Applications certified for cULus up to +60 °C</td>
<td></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>
<td></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>
<td></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>
<td></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>
<td></td>
</tr>
<tr>
<td>Storage / Transport</td>
<td>-40 °C...+85 °C</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>Operating / Storage: 100 % r. H. with condensation</td>
<td></td>
</tr>
<tr>
<td>Air pressure</td>
<td>Operating:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1000 m...4000 m (1080 hPa...620 hPa)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 2000 m (&lt; 795 hPa):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● max. operating temperature must be reduced by 10 K (e.g. 70 °C to 60°C)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● I/O module relay contacts must be operated with 24 V nominal only</td>
<td></td>
</tr>
<tr>
<td>Immunity to corrosive gases</td>
<td>Operating: Yes, according to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ISA S71.04.1985 Harsh group A, G3/GX</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IEC 60721-3-3 3C2 / 3C3</td>
<td></td>
</tr>
<tr>
<td>Immunity to salt mist</td>
<td>Operating: Yes, horizontal mounting only, according to IEC 60068-2-52 severity level: 1</td>
<td></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.
<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 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 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 12: 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 V DC): 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 V DC): 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