

DATA SHEET

PM554, PM556, PM564, PM566

Processor Module



1 Ordering data

Table 1: Processor modules for AC500-eCo

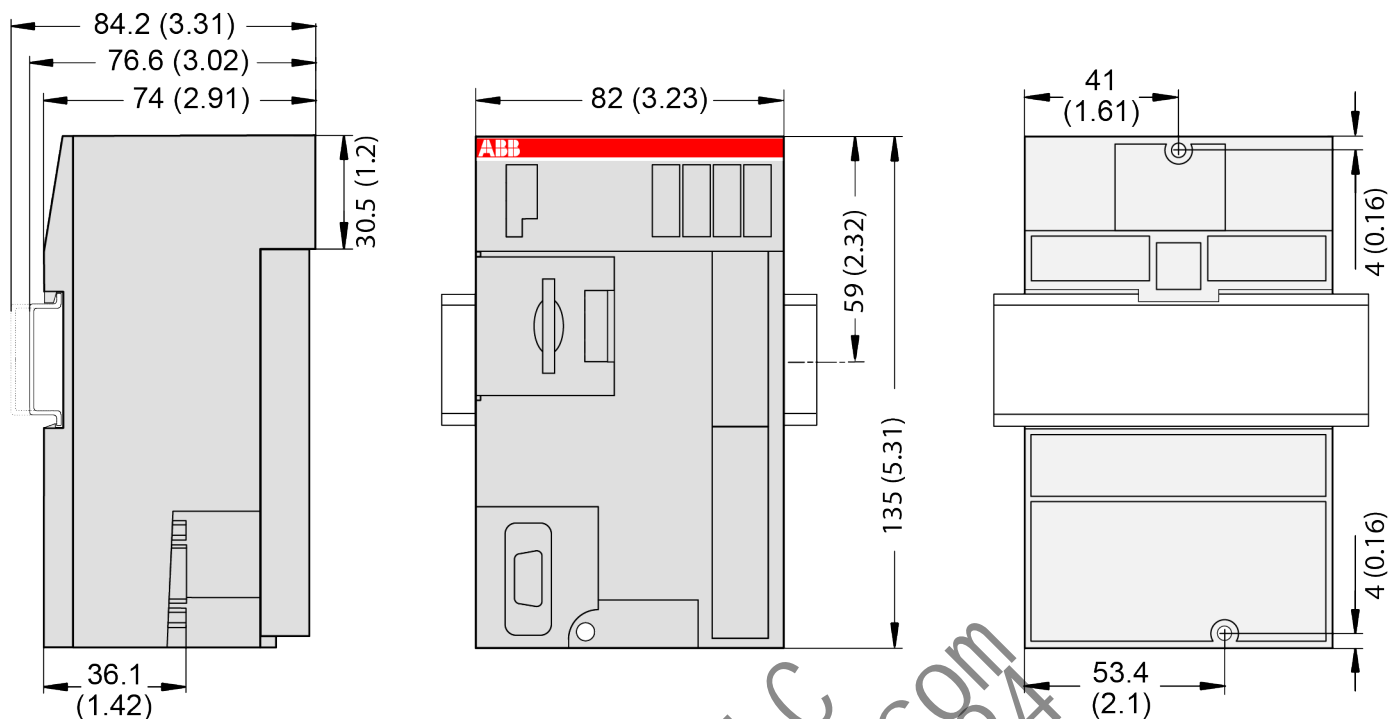
| Part no. | Description | Product life cycle phase *) | Possible migration device |
|--------------------|--|-----------------------------|---------------------------|
| 1SAP 120 600 R0001 | PM554-TP processor module, 128 kB memory, 8 DI, 6 DO-T, 24 V DC, with pluggable I/O terminal blocks | Classic | |
| 1SAP 120 600 R0071 | PM554-TP-ETH, processor module, 128 kB memory, 8 DI, 6 DO-T, 24 V DC, onboard Ethernet, with pluggable I/O terminal blocks | Classic | |
| 1SAP 120 700 R0001 | PM554-RP, processor module, 128 kB memory, 8 DI, 6 DO-R, 24 V DC, with pluggable I/O terminal blocks | Classic | |
| 1SAP 120 800 R0001 | PM554-RP-AC, processor module, 128 kB memory, 8 DI, 6 DO-R, 100 V AC ... 240 V AC, with pluggable I/O terminal blocks | Classic | |

| Part no. | Description | Product life cycle phase *) | Possible migration device |
|-----------------------|---|-----------------------------|--|
| 1SAP 121 200 R0071 | PM556-TP-ETH, processor module, 512 kB memory, 8 DI, 6 DO-T, 24 V DC, onboard Ethernet, with pluggable I/O terminal blocks | Classic | |
| 1SAP 120 900 R0001 | PM564-TP, processor module, 128 kB memory, 6 DI, 6 DO-T, 2 AI and 1 AO, 24 V DC | Classic | PM5012-T-ETH/PM5032-T- ETH |
| 1SAP 120 900 R0071 | PM564-TP-ETH, processor module, 128 kB memory, 6 DI, 6 DO-T 2 AI and 1 AO, 24 V DC, Ethernet interface | Classic | PM5032-T-ETH |
| 1SAP 121 000 R0001 | PM564-RP, processor module, 128 kB memory, 6 DI, 6 DO-R, 2 AI and 1 AO, 24 V DC | Classic | PM5012-T-ETH/PM5032-T- ETH |
| 1SAP 121 100 R0001 | PM564-RP-AC, processor module, 128 kB memory, 6 DI, 6 DO-R, 2 AI and 1 AO, 100 V AC ... 240 V | Classic | PM5012-T-ETH/PM5032-T- ETH |
| 1SAP 121 000 R0071 | PM564-RP-ETH, processor module, 128 kB memory, 6 DI, 6 DO-R, 2 AI and 1 AO, 24 V DC, Ethernet interface | Classic | PM5032-R-ETH/PM5052-R- ETH |
| 1SAP 121 100 R0071 | PM564-RP-ETH-AC, processor module, 128 kB memory, 6 DI, 6 DO-R, 2 AI and 1 AO, 100 V AC ... 240 V AC, Ethernet interface | Classic | PM5032-R-ETH/PM5052-R- ETH |
| 1SAP 121 500 R0071 | PM566-TP-ETH, processor module, 512 kB memory, 6 DI, 6 DO-T, 2 AI and 1 AO, 24 V DC, Ethernet interface | Classic | PM5052-T-ETH/PM5072- T-2ETH/PM5082-T-2ETH |



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

1.1 Dimensions



The dimensions are in mm and in brackets in inch.

2 Technical data

The system data of AC500-eCo apply.

↪ Chapter 3 "System data AC500-eCo" on page 7

Only additional details are therefore documented below.

General data

| Power supply | 24 V DC | 100 - 240 V AC |
|--|--|--|
| Connection of power supply | Via removable 5-pin screw terminal | |
| Current consumption from power supply (max.) | PM554-TP: 180 mA PM554-TP-ETH: 190 mA PM554-RP: 220 mA PM556-TP-ETH: 190 mA PM564-TP: 210 mA PM564-TP-ETH: 220 mA PM564-RP: 240 mA PM564-RP-ETH: 250 mA PM566-TP-ETH: 220 mA | PM554-RP-AC: 200 mA at 100 V AC, 110 mA at 240 V AC *) PM564-RP-AC: 210 mA at 100 V AC, 125 mA at 240 V AC *) PM564-RP-ETH-AC: 220 mA at 100 V AC, 130 mA at 240 V AC *) |

| Power supply | 24 V DC | 100 - 240 V AC |
|--|---|--|
| Current consumption from power supply (typ.) | PM554-TP: 60 mA PM554-TP-ETH: 70 mA PM554-RP: 80 mA PM556-TP-ETH: 70 mA PM564-TP: 95 mA PM564-TP-ETH: 100 mA PM564-RP: 110 mA PM564-RP-ETH: 120 mA PM566-TP-ETH: 100 mA | PM554-RP-AC: 20 mA at 100 V AC, 12 mA at 240 V AC *) PM564-RP-AC: 20 mA at 100 V AC, 11 mA at 240 V AC *) PM564-RP-ETH-AC: 23 mA at 100 V AC, 14 mA at 240 V AC *) |
| Inrush current at nominal voltage | Typ. 3.9 A ² s | Typ. 0.3 A ² s |
| Required fuse | 3 A fast | Max. 10 A |
| Max. power dissipation within the processor module | PM554-TP: 3.0 W PM554-TP-ETH: 3.3 W PM554-RP: 3.5 W PM556-TP-ETH: 3.3 W PM564-TP: 3.9 W PM564-TP-ETH: 4.4 W PM564-RP: 4.5 W PM564-RP-ETH: 4.9 W PM566-TP-ETH: 4.4 W | PM554-RP-AC: 4.8 W PM564-RP-AC: 4.8 W PM564-RP-ETH-AC: 5.3 W |
| Processor module interfaces | I/O bus, COM1, COM2 (optional), Ethernet (depending on model) | |
| Connection system | see System Assembly, Construction and Connection | |
| Weight | PM554-TP: 300 g PM554-TP-ETH: 300 g PM554-RP: 350 g PM556-TP-ETH: 300 g PM564-TP: 300 g PM564-TP-ETH: 300 g PM564-RP: 350 g PM564-RP-ETH: 350 g PM566-TP-ETH: 300 g | PM554-RP-AC: 400 g PM564-RP-AC: 400 g PM564-RP-ETH-AC: 400 g |
| Mounting position | horizontal or vertical | |

*) These values show the value of the apparent current (sum of active and reactive current)

Detailed data

| | |
|----------------|--|
| Program memory | 128 kB Flash EPROM (PM554-xP and PM564-xP types) 512 kB Flash EPROM (PM556-xP and PM566-xP types) |
| Data memory | |
| - VAR data | 10 kB |

| | |
|--|--|
| - VAR_RETAIN data | 1 kB, always buffered in flash |
| - %RB data (persistent) | 1 kB, can be buffered in flash (depending on configuration) |
| - %MB data | 2 kB (PM554 and PM564 types) 64 kB (PM556 and PM566 types) |
| Data buffering | In flash memory |
| Real-time clock (RTC) | Optional |
| Battery low indication | Warning |
| Programming languages | - Instruction List (IL) - Function Block Diagram (FBD) - Ladder Diagram (LD) - Sequential Function Chart (SFC) - Structured Text (ST) - Continuous Function Chart (CFC) |
| Processor type | Freescale ARM Processor 32-bit |
| Processor clock speed | 50 MHz |
| Cycle time for 1000 instructions | |
| Binary | 0.08 ms |
| Word | 0.1 ms |
| Floating point | 1.2 ms |
| Program execution | |
| Cyclic | Yes |
| Time-controlled | Yes |
| Multitasking | Yes |
| Interruption | 1 interrupted with up or down edge detection |
| LEDs | Power, Run, Error, Status of I/Os |
| RUN/STOP switch | Yes |
| Protection of the user program by password | Possible |
| Usable accessories | MC503: Memory card TA561-RTC: Real-time clock TA562-RS: Serial RS-485 TA569-RS-ISO: Serial RS-485 isolated TA562-RS-RTC: Real-time clock and serial RS-485 |

Detailed data of the interfaces

| Serial interface COM1 | |
|------------------------------|---------------------------------------|
| Physical link | RS-485 |
| Galvanic isolation | none |
| Transmission rate | Configurable from 1.2 to 187.5 kBit/s |
| Connection | 9-pin D-sub female connector |

| Serial interface COM1 | |
|------------------------------|---|
| Common mode range | Typ. -8 V / +12 V (CAUTION: The interface can be damaged if the signal exceeds the common mode range.) |
| Usage | - Programming port - Modbus (master and slave) - Serial ASCII communication - CS31 (master only) |

| Serial interface COM2 (optional) | |
|---|---|
| Physical link | RS-485 |
| Galvanic isolation | none (TA562-RS or TA562-RS-RTC) 500 V DC (TA569-RS-ISO) |
| Baudrate | Configurable from 1.2 to 115.2 kBit/s |
| Connection | Removable 5-pin terminal block |
| Common mode range | Typ. -8 V / +12 V (CAUTION: The interface can be damaged if the signal exceeds the common mode range.) |
| Usage | - Programming port - Modbus (master and slave) - Serial ASCII communication |

Data of I/Os

| | PM55x-xP | PM56x-xP |
|----------------------------|---|--|
| Max. number of I/O modules | 10 | 10 |
| Digital inputs | 320 + 8 | 320 + 8 |
| Digital outputs | 240 + 6 | 240 + 6 |
| Type of digital outputs | PM554-TP PM554-TP-ETH PM554-RP PM554-RP-AC PM556-TP-ETH PM564-TP PM564-TP-ETH PM564-RP PM564-RP-AC PM564-RP-ETH PM564-RP-ETH-AC PM566-TP-ETH | Transistor Transistor Relays Relays Transistor Transistor Transistor Relays Relays Relays Relays Transistor |
| Analog inputs | 160 | 160 + 2 |
| Analog outputs | 160 | 160 + 1 |

| | PM55x-xP | PM56x-xP |
|--|---|----------|
| Number of decentralized inputs and outputs | On CS31 Bus: up to 31 stations with up to 120 digital inputs / 120 digital outputs each | |
| Detailed data of the onboard I/O | Onboard I/Os in PM55x and Onboard I/Os in PM56x | |

No effects of multiple overloads

No effects of multiple overloads on isolated multi-channel modules occur, as every channel is protected individually by an external fuse.

3 System data AC500-eCo

3.1 Environmental conditions

Table 2: Process and supply voltages

| Parameter | Value |
|--|--|
| 24 V DC | |
| Voltage | 24 V (-15 %, +20 %) |
| Protection against reverse polarity | Yes |
| 24 V AC | |
| Voltage | 24 V (-15 %, +10 %) |
| Frequency | 50/60 Hz (-6 %, +4 %) |
| 100 V AC ... 240 V AC wide-range supply | |
| Voltage | 100 V ... 240 V (-15 %, +10 %) |
| Frequency | 50/60 Hz (-6 %, +4 %) |
| 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!

Risk of damaging the PLC due to improper voltage levels!

- Never exceed the maximum tolerance values for process and supply voltages.
 - Never fall below the minimum tolerance values for process and supply voltages.
- Observe the **system data** and the **technical data** of the used module.
 ↪ Chapter 3 "System data AC500-eCo" on page 7



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.

| Parameter | Value |
|--------------|--|
| Temperature | |
| Operating | 0 °C ... +60 °C (horizontal mounting of modules) 0 °C ... +40 °C (vertical mounting of modules and output load reduced to 50 % per group) |
| Storage | -40 °C ... +70 °C |
| Transport | -40 °C ... +70 °C |
| Humidity | Max. 95 %, without condensation |
| Air pressure | |
| Operating | > 800 hPa / < 2000 m |
| Storage | > 660 hPa / < 3500 m |

3.2 Creepage distances and clearances

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

3.3 Power supply units



AC500 and AC500-eCo PLC devices are Class II/Class III devices and do not require a Protective Earth (PE) connection.

For proper EMC performance, all metal parts, DIN rails, mounting screws, and cable shield connection terminals are connected to a common ground and provide Functional Earth (FE). This is typically connected to a common reference potential, such as equipotential bonding rails.

Signal Grounds (SGND or GND) are used for signal reference and must not be connected to cable shields, FE or other signals unless otherwise specified in the specific device description.

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.

3.4 Electromagnetic compatibility

Table 3: Range of use

| Application |
|--|
| Device suitable only as <i>Control Equipment for Industrial Applications</i> . |

Table 4: Electromagnetic compatibility

| Parameter | Value |
|---|---|
| Device suitable only as <i>Control Equipment for Industrial Applications</i> , including marine applications. IEC 61131-2, zone B ☞ Chapter 3.6 “Approvals and certifications” on page 11 | |
| Radiated emission according to IEC 61000-6-4 CISPR11, class A | Yes |
| Conducted emission according to IEC 61000-6-4 CISPR11, class A | Yes |
| Electrostatic discharge (ESD) according to IEC 61000-4-2, criterion B | Air discharge: 8 kV Contact discharge: 6 kV |
| Fast transient interference voltages (burst) according to IEC 61000-4-4, criterion B | Power supply (DC): 2 kV Digital inputs/outputs (24 V DC): 1 kV Digital inputs/outputs (240 V AC): 2 kV Analog inputs/outputs: 1 kV Communication lines shielded: 1 kV |

| Parameter | Value |
|---|--|
| High energy transient interference voltages (surge) according to IEC 61000-4-5, criterion B | Power supply (DC): - Line to ground: 1 kV - Line to line: 0,5 kV Digital inputs/outputs/relay: (24 V DC): - Line to ground: 1 kV (AC): - Line to ground: 2 kV - Line to line: 1 kV Analog inputs/outputs: - Line to ground: 1 kV Communication lines: - Line to ground: 1 kV |
| Influence of radiated disturbances IEC 61000-4-3, criterion A | Test field strength: 10 V/m |
| Influence of line-conducted interferences IEC 61000-4-6, criterion A | Test voltage: 10 V |
| Power frequency magnetic fields IEC 61000-4-8, criterion A | 30 A/m 50 Hz 30 A/m 60 Hz |

3.5 Mechanical data

| Parameter | Value |
|---|---|
| Mounting | Horizontal/Vertical |
| Wiring method | Spring/screw terminals |
| Degree of protection | PLC system: IP 20 <ul style="list-style-type: none"> with all modules or option boards plugged in with all terminals plugged in with all covers closed |
| Housing | Classification V-2 according to UL 94 |
| Vibration resistance (sinusoidal) acc. to IEC 60068-2-6 | All three axes 2 Hz ... 8.4 Hz, 3.5 mm peak, 8.4 Hz ... 150 Hz, 1 g |
| Shock test acc. to IEC 60068-2-27 | All three axes 15 g, 11 ms, half-sinusoidal |
| Mounting of the modules: | |
| Mounting Rail Top Hat according to IEC 60715 | 35 mm, depth 7.5 mm or 15 mm |
| Mounting with screws | M4 |
| Fastening torque | 1.2 Nm |

3.6 Approvals and certifications

The PLC Automation catalog contains an *overview of the available approvals and certifications.*

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