DATA SHEET

PM554, PM556, PM564, PM566

Processor Module

1 Ordering data

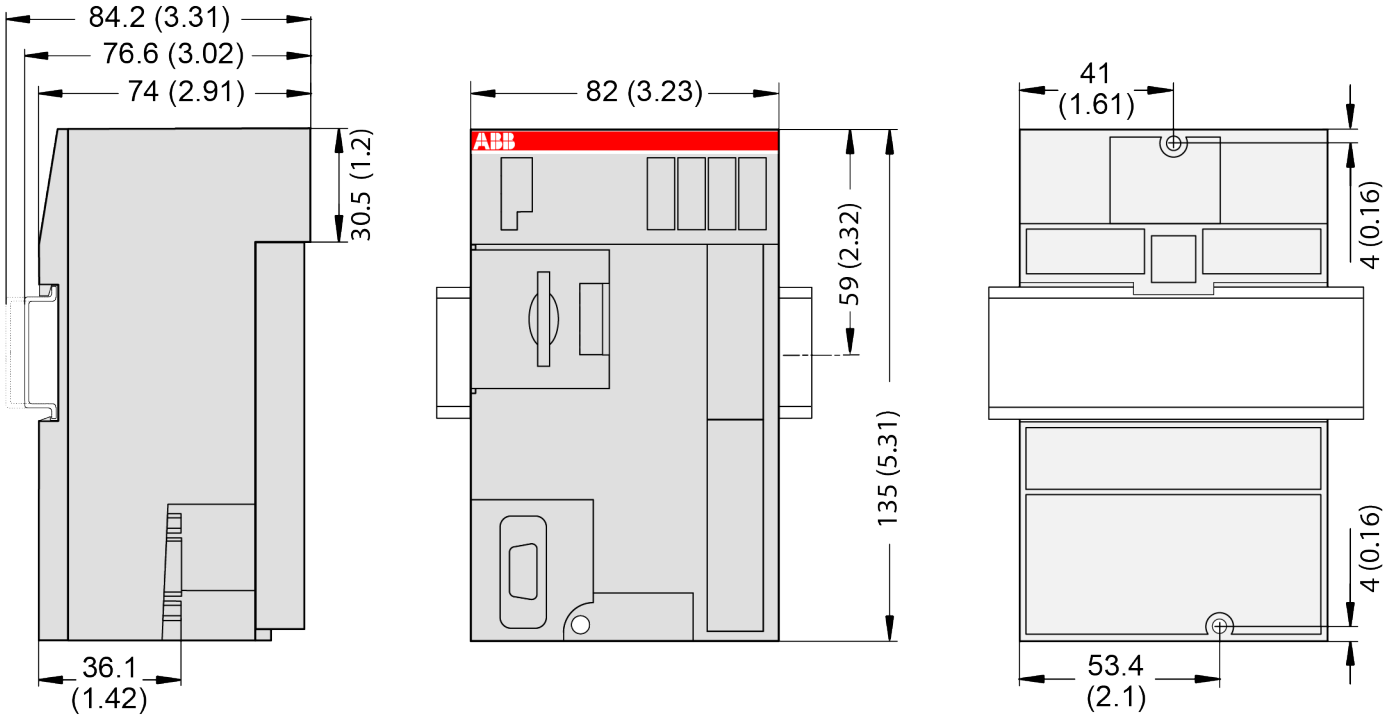
Table 1: Processor modules for AC500-eCo

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^2s	Typ. 0.3 A^2s
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
- Frenquency 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 *Control Equipment for Industrial Applications*.

Table 4: Electromagnetic compatibility

Parameter	**Value**
Device suitable only as *Control Equipment for Industrial Applications*, 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 ● 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*.