DATA SHEET - ORIGINAL INSTRUCTIONS

PM572, PM573, PM582, PM583, PM585, PM590, PM591, PM592

Processor module



1 Ordering data

Processor modules for AC500 (Standard) V2 products

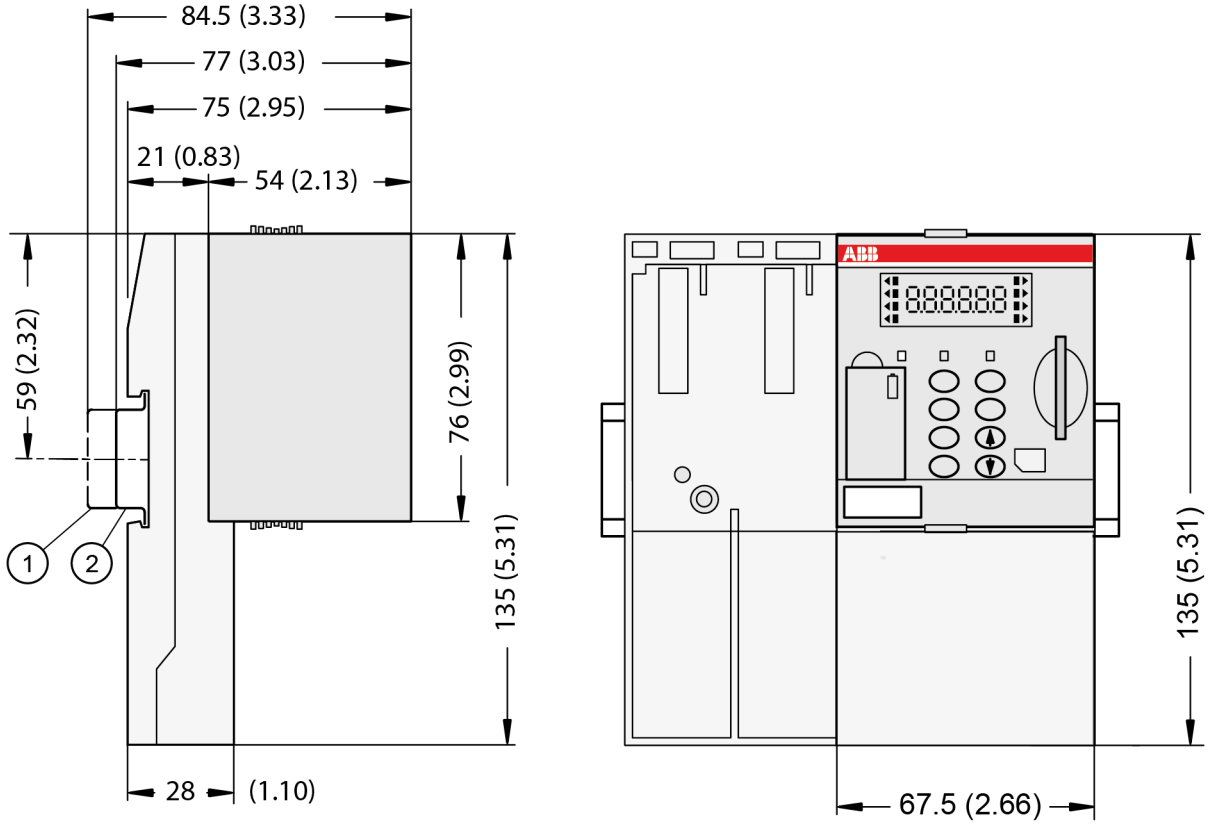
Part no.	Description	Product life cycle phase *)
1SAP 130 300 R0271	PM573-ETH, processor module, memory 512 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display, onboard Ethernet TCP/IP with web server, SNTP, IEC60870-5-104 protocols	Classic
1SAP 330 300 R0271	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	Classic
1SAP 140 200 R0201	PM582, processor module, memory 512 kB, 24 V DC, memory card slot, interfaces 2 RS-232/485 (programming, Modbus/CS31), 1 FBP, display	Classic

Part no.	Description	Product life cycle phase *)
1SAP 340 200 R0201	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	Classic
1SAP 140 300 R0271	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	Classic
1SAP 340 300 R0271	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	Classic
1SAP 140 500 R0271	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	Classic
1SAP 150 000 R0261	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	Classic
1SAP 150 000 R0271	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	Classic
1SAP 150 100 R0271	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	Classic
1SAP 150 100 R0277	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	Classic
1SAP 350 100 R0271	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	Classic

Part no.	Description	Product life cycle phase *)
1SAP 150 200 R0271	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	Classic
1SAP 350 200 R0271	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	Classic

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

2 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

3 Technical data

The AC500 and S500 system data is applicable to the standard version.

Chapter 4 “System data AC500” on page 11

The AC500-XC system data is applicable to the XC version.

Chapter 5 “System data AC500-XC” on page 15

Only deviating specifications are therefore described here.

The technical data is also applicable to the XC version.

Processor module and terminal base

Parameter	Value
Connection of the supply voltage 24 V DC at the terminal base of the processor module	Removable 5-pin terminal block with spring connection
Current consumption from 24 V DC	PM57x: 50 mA PM57x-ETH: 110 mA
	PM58x: 50 mA PM58x-ETH: 110 mA PM58x-ARCNET: 110 mA
	PM59x: 90 mA PM59x-ETH: 150 mA PM59x-2ETH: 150 mA PM59x-ARCNET: 150 mA
Slots on the terminal bases	TB511: 1 processor module, 1 communication module
	TB521: 1 processor module, 2 communication modules
	TB523: 1 processor module, 2 communication modules
	TB541: 1 processor module, 4 communication modules
Processor module interfaces at the terminal bases TB5x1	I/O bus, COM1, COM2, FBP
Processor module interfaces at the terminal bases TB5x3	I/O bus, COM1
Processor module network interfaces at the terminal bases	TB5x1-ETH / AC500 CPU with Ethernet interface
	TB5x3-ETH / AC500CPU with two Ethernet interfaces
	TB5x1-ARCNET / AC500 CPU with ARCNET
Connection system	See 'Connection and Wiring'
Weight (processor module without terminal base)	PM582: 135 g PM58x-ETH: 150 g

Parameter	Value
	PM59x: 135 g PM59x-ETH: 150 g PM59x-2ETH: 150 g PM59x-ARCNET: 160 g
Mounting position	Horizontal or vertical

Detailed data

Table 1: PM57x

Processor Module		PM572	PM573-ETH
Program memory flash EPROM and RAM		128 kB	512 kB
Data memory, integrated		128 kB, incl. 12 kB buffered	512 kB, incl. 288 kB buffered
Expandable memory		None	None
Integrated mass storage memory		None	None
Pluggable memory card for:			
	User data storage	x	x
	Program storage	x	x
	Firmware update	x	x
	Processor type	Freescale ARM Processor 32-bit	
	Processor clock speed	50 MHz	
Cycle time for 1 instruction:			
	Binary	Min. 0.06 µs	Min. 0.06 µs
	Word	Min. 0.09 µs	Min. 0.09 µs
	Floating point	Min. 0.70 µs	Min. 0.70 µs
Max. number of central inputs and outputs (up to 7 exp. modules): ([1])			
	Digital inputs	224	224
	Digital outputs	224	224
	Analog inputs	112	112
	Analog outputs	112	112
Max. number of central inputs and outputs (10 exp. modules):			
	Digital inputs	320	320
	Digital outputs	320	320
	Analog inputs	160	160
	Analog outputs	160	160
Number of decentralized inputs and outputs		Depends on the fieldbus used (as an info on the CS31 bus: up to 31 stations with up to 120 DI / 120 DO each)	
Data backup		Battery	
Data buffering time at +25 °C		Typ. 3 years without power supply	
Battery low indication		Warning issued about 2 weeks before the state of charge becomes critical	

Processor Module		PM572	PM573-ETH
Real-time clock:			
	With battery backup	x	x
	Accuracy	Typ. ± 2 s / day at +25 °C	
Program execution:			
	Cyclic	x	x
	Time-controlled	x	x
	Multitasking	x	x
Protection of the user program by a password		x	x
Serial interface COM1:			
	Physical link	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	
	Connection		
	Usage		
Serial interface COM2 (not for PM5xy-2ETH models):			
	Physical link	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	
	Connection		
	Usage		
Integrated communication module:			
	ETH = Ethernet	-	ETH onboard with web server, SNTP and IEC60870-5-104 protocol
	RJ45	-	
	ARCNET = ARCNET BNC	-	
Number of external communication modules		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)	
Ethernet		-	10/100 base-TX, 1x RJ45 socket, provided on TB5x1-ETH
LEDs, LCD display, 8 function keys		For RUN/STOP switchover, status displays and diagnosis	
Number of timers		Unlimited	
Number of counters		Unlimited	
Programming languages:			
	Structured Text ST	x	x
	Instruction List IL	x	x
	Function Block Diagram FBD	x	x
	Ladder Diagram LD	x	x
	Sequential Function Chart SFC	x	x
	Continuous Function Chart CFC	x	x

[1] Up to 7 I/O terminal units before PS501 V1.2 and processor module firmware before V1.2.0.

Table 2: PM58x

Processor Module		**PM582**	**PM583-ETH**	**PM585-ETH**
Program memory flash EPROM and RAM		512 kB	1024 kB	1024 kB
Data memory, integrated		416 kB, incl. 288 kB buffered	1024 kB, incl. 288 kB buffered	1536 kB, incl. 512 kB buffered
Expandable memory		None	None	None
Integrated mass storage memory		None	None	None
Pluggable memory card for:				
	User data storage	x	x	x
	Program storage	x	x	x
	Firmware update	x	x	x
	Processor type	Freescale ARM Processor 32-bit		
	Processor clock speed	84 MHz		400 MHz
Cycle time for 1 instruction:				
	Binary	Min. 0.05 µs		Min. 0.004 µs
	Word	Min. 0.06 µs		Min. 0.008 µs
	Floating point	Min. 0.50 µs		Min. 0.008 µs
Max. number of central inputs and outputs (up to 7 exp. modules): [1])				
	Digital inputs	224		
	Digital outputs	224		
	Analog inputs	112		
	Analog outputs	112		
Max. number of central inputs and outputs (10 exp. modules):				
	Digital inputs	320		
	Digital outputs	320		
	Analog inputs	160		
	Analog outputs	160		
Number of decentralized inputs and outputs		Depends on the fieldbus used (as an info on the CS31 bus: up to 31 stations with up to 120 DI / 120 DO each)		
Data backup		Battery		
Data buffering time at +25 °C		Typ. 3 years without power supply		
Battery low indication		Warning issued about 2 weeks before the state of charge becomes critical		
Real-time clock:				
	With battery backup	x		
	Accuracy	Typ. ±2 s / day at +25 °C		
Program execution:				
	Cyclic	x		
	Time-controlled	x		
	Multitasking	x		
Protection of the user program by a password		x		

Processor Module		PM582	PM583-ETH	PM585-ETH
Serial interface COM1:				
	Physical link	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		
	Connection			
	Usage			
Serial interface COM2 (not for PM5xy-2ETH models):				
	Physical link	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		
	Connection			
	Usage			
Integrated communication module:				
	ETH = Ethernet	-	ETH onboard with web server, SNTP and IEC60870-5-104 protocol	
	RJ45	-		
	ARCNET = ARCNET BNC	-		
Number of external communication modules		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)		
Ethernet		-	10/100 base-TX, 1x RJ45 socket, provided on TB5x1-ETH	
LEDs, LCD display, 8 Function Keys		For RUN/STOP switchover, status displays and diagnosis		
Number of timers		Unlimited		
Number of counters		Unlimited		
Programming languages:				
	Structured Text ST	x		
	Instruction List IL	x		
	Function Block Diagram FBD	x		
	Ladder Diagram LD	x		
	Sequential Function Chart SFC	x		
	Continuous Function Chart (CFC)	x		
[1)]Up to 7 I/O terminal units before PS501 V1.2 and processor module firmware before V1.2.0.				

Table 3: PM59x [2)]

Processor Module		**PM59x-ETH**	**PM59x-ARCNET**	**PM59x-ETH** **PM59x-2ETH**
Program memory flash EPROM and RAM		PM590: 2048 kB PM591/PM592: 4096 kB		
Data memory, integrated		PM590: 2560 kB, PM591: 3584 kB, incl. 1536 kB buffered		PM590: 3072 kB, PM591/592: 5632 kB, incl. 1536 kB buffered
Expandable memory		None	None	None
Integrated mass storage memory		None	None	PM592-ETH: 4 GB flash disk
Pluggable memory card for:				
	User data storage	x	x	x
	Program storage	x	x	x
	Firmware update	x	x	x
	Processor type	Freescale ARM Processor 32-bit		
	Processor clock speed	400 MHz		
Cycle time for 1 instruction:				
	Binary	Min. 0.002 µs	Min. 0.002 µs	Min. 0.002 µs
	Word	Min. 0.004 µs	Min. 0.004 µs	Min. 0.004 µs
	Floating point	Min. 0.004 µs	Min. 0.004 µs	Min. 0.004 µs
Max. number of central inputs and outputs (up to 7 exp. modules): [1)]				
	Digital inputs	224	224	224
	Digital outputs	224	224	224
	Analog inputs	112	112	112
	Analog outputs	112	112	112
Max. number of central inputs and outputs (10 exp. modules):				
	Digital inputs	320	320	320
	Digital outputs	320	320	320
	Analog inputs	160	160	160
	Analog outputs	160	160	160
Number of decentralized inputs and outputs		Depends on the fieldbus used (as an info on the CS31 bus: up to 31 stations with up to 120 DI / 120 DO each)		
Data backup		Battery		
Data buffering time at +25 °C		Typ. 3 years without power supply		
Battery low indication		Warning issued about 2 weeks before the state of charge becomes critical		
Real-time clock:				
	With battery backup	x	x	x
	Accuracy	Typ. ±2 s / day at +25 °C	Typ. ±2 s / day at +25 °C	Typ. ±2 s / day at +25 °C

Processor Module		PM59x-ETH	PM59x-ARCNET	PM59x-ETH PM59x-2ETH
Program execution:				
	Cyclic	x	x	x
	Time-controlled	x	x	x
	Multitasking	x	x	x
Password protection of user program		x	x	x
Serial interface COM1:				
	Physical link	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		
	Connection			
	Usage			
Serial interface COM2 (not for PM5xy-2ETH models):				
	Physical link	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		
	Connection			
	Usage			
Integrated communication module:				
	ETH = Ethernet	ETH	ARCNET	ETH onboard with web server, SNTP and IEC60870-5-104 protocol
	RJ45	ETH	ARCNET	
	ARCNET = ARCNET BNC	ETH	ARCNET	
Number of external communication modules		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)		
Ethernet		10/100 base-TX, 1x RJ45 socket	-	PM59x-ETH: 10/100 base-TX, 1x RJ45 socket, provided on TB5x1-ETH PM591-2ETH: 10/100 base-TX, independent interfaces, 2x RJ45 socket, provided on TB521-2ETH
LEDs, LCD display, 8 Function Keys		For RUN/STOP switchover, status displays and diagnosis		
Number of timers		Unlimited	Unlimited	Unlimited
Number of counters		Unlimited	Unlimited	Unlimited
Programming languages:				
	Structured Text ST	x	x	x
	Instruction List IL	x	x	x
	Function Block Diagram FBD	x	x	x
	Ladder Diagram LD	x	x	x
	Sequential Function Chart SFC	x	x	x

Processor Module		PM59x-ETH	PM59x-ARCNET	PM59x-ETH PM59x-2ETH
	Continuous Function Chart (CFC)	x	x	x
[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 4: Process and supply voltages

Parameter		Value
24 V DC		
	Voltage	24 V (-15 %, +20 %)
	Protection against reverse polarity	Yes
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** ↯ *Chapter 4 “System data AC500” on page 11* and the **technical data** of the module used.

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.

For information about the cables refer to:

- *Instruction sheet*
- Sections about wiring of specific modules in *Installation instructions for the AC500 product family*
- *ABB online help for Automation Builder AC500 V3, CP600*

Parameter		Value
Temperature		
	Operating	0 °C ... +60 °C: Horizontal mounting of modules. 0 °C ... +40 °C: Vertical mounting of modules. 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

4.2 Creepage distances and clearances

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

4.3 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.

4.4 Electromagnetic compatibility

Table 5: Electromagnetic compatibility

Parameter	Value
Device suitable only as *Control Equipment for Industrial Applications*, including marine applications. IEC 61131-2, zone B ↳ *Chapter 4.6 "Approvals and certifications" on page 15*	
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

4.5 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

4.6 Approvals and certifications

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

5 System data AC500-XC

5.1 Environmental conditions

Table 6: Process and supply voltages

Parameter		Value
24 V DC		
	Voltage	24 V (-15 %, +20 %)
	Protection against reverse polarity	Yes
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** *Chapter 4 “System data AC500” on page 11* and the **technical data** of the module used.

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.

For information about the cables refer to:

- *Instruction sheet*
- Sections about wiring of specific modules in *Installation instructions for the AC500 product family*
- *ABB online help for Automation Builder AC500 V3, CP600*

Parameter		Value
Temperature		
	Operating	-40 °C ... +70 °C -40 °C ... 0 °C: Due to the LCD technology, the display might respond very slowly. -40 °C ... +40 °C: Vertical mounting of modules possible, output load limited to 50 % per group +60 °C ... +70 °C with the following deratings: ● System is limited to maximum 2 communication modules per terminal base. ● Applications certified for cULus up to +60 °C ● Digital inputs: maximum number of simultaneously switched on input channels limited to 75 % per group (e.g. 8 channels => 6 channels). ● Digital outputs: output current maximum value (all channels together) limited to 75 % per group (e.g. 8 A => 6 A). ● Analog outputs only if configured as voltage output: maximum total output current per group is limited to 75 % (e.g. 40 mA => 30 mA). ● Analog outputs only if configured as current output: maximum number of simultaneously used output channels limited to 75 % per group (e.g. 4 channels => 3 channels).
	Storage / Transport	-40 °C ... +85 °C
Humidity		Operating / Storage: 100 % r. H. with condensation
Air pressure		Operating: -1000 m .... 5000 m (1080 hPa ... 620 hPa) > 2000 m (< 795 hPa): ● Maximum operating temperature must be reducted by 10 K for each 1000 m exceeding 2000 m. ● I/O module relay contacts must be operated with 24 V nominal only.
Immunity to corrosive gases		Yes, according to: ISA S71.04.1985 Harsh group A, G3/GX IEC60068-2-60 Method 4 with the following concentrations: ● H2S 100 ± 10ppb ● NO2 1250 ± 20ppb ● CL2 100 ± 10ppb ● SO2 300 ± 20ppb
Immunity to salt mist		Yes, horizontal mounting only, according to IEC 60068-2-52 severity level: 1

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.

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 Creepage distances and clearances

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

5.3 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.

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.

5.4 Electromagnetic compatibility

Table 7: Electromagnetic compatibility

Parameter	Value
Device suitable only as *Control Equipment for Industrial Applications*, including marine applications. IEC 61131-2, zone B ↳ *Chapter 5.6 “Approvals and certifications” on page 19*	
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): 4 kV Digital inputs/outputs (24 V DC): 2 kV Digital inputs/outputs (240 V AC): 4 kV Analog inputs/outputs: 2 kV Communication lines shielded: 2 kV
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

Parameter	Value
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

5.5 Mechanical data

Parameter	Value
Mounting	Horizontal/vertical (no application in salt mist environment)
Wiring method	Spring 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	2 Hz ... 8.4 Hz, 3.5 mm peak, 8.4 Hz ... 500 Hz, 2 g
Vibration resistance (broadband random) acc. to IEC 60068-2-64	5 Hz ... 500 Hz, 1,9 g rms (operational) 5 Hz ... 500 Hz, 4 g rms (non operational)
Shock resistance	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

5.6 Approvals and certifications

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

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