



Main

Range of product	Modicon M221
Product or component type	Logic controller
[Us] rated supply voltage	24 V DC
Discrete input number	9 discrete input conforming to IEC 61131-2 Type 1 including 4 fast input
Analogue input number	2 at input range: 0...10 V
Discrete output type	Transistor
Discrete output number	7 transistor including 2 fast output
Discrete output voltage	24 V DC
Discrete output current	0.5 A

Complementary

Discrete I/O number	16
Number of I/O expansion module	<= 4 with <= 28 discrete output(s) for relay output <= 4 with <= 136 discrete output(s) for transistor output
Supply voltage limits	19.2...28.8 V
Inrush current	<= 35 A
Power consumption in W	<= 11 W at 24 V
Discrete input logic	Sink or source (positive/negative)
Discrete input voltage	24 V
Discrete input voltage type	DC
Analogue input resolution	10 bits
LSB value	10 mV
Conversion time	1 ms per channel + 1 controller cycle time for analog input
Permitted overload on inputs	+/- 15 V DC for analog input permanent +/- 30 V DC for analog input with 5 min maximum
Voltage state1 guaranteed	>= 15 V for input
Current state 1 guaranteed	>= 2.5 mA for input
Voltage state 0 guaranteed	<= 5 V for input
Current state 0 guaranteed	<= 1 mA for input
Discrete input current	7 mA for input
Input impedance	100 kOhm for analog input 3.4 kOhm for discrete input
Response time	10 ms turn-off operation for output 10 ms turn-on operation for output 5 µs turn-off operation for fast input 5 µs turn-on operation for fast input 100 µs turn-off operation for input; I8...I15 terminal 100 µs turn-on operation for input; I8...I15 terminal 35 µs turn-off operation for input; I2...I5 terminal 35 µs turn-on operation for input; I2...I5 terminal
Configurable filtering time	12 ms for input 3 ms for input 0 ms for input
Discrete output logic	Positive logic (source)
Output frequency	100 kHz for fast output (PWM/PLS mode) at Q0...Q1 terminal 0.1 kHz at Q2...Q6 terminal
Absolute accuracy error	+/- 1 % of full scale for analog input
Leakage current	0.1 mA for transistor output
Voltage drop	<= 1 V

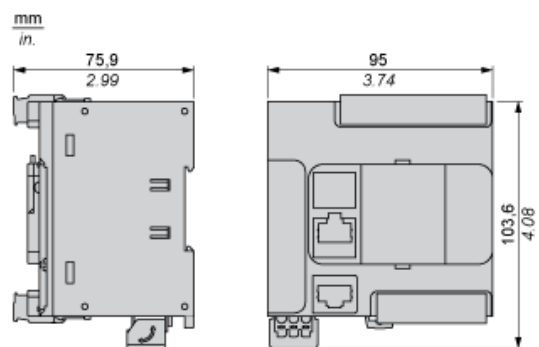
Mechanical durability	>= 20000000 cycles for transistor output
Tungsten load	<= 12 W for output and fast output
Protection type	Overload and short-circuit protection at 1.3 A
Reset time	1 s automatic reset
Memory capacity	256 kB for program with 10000 instructions
Data backed up	256 kB built-in flash memory for backup of programs
Data storage equipment	2 GB SD card optional
Battery type	BR2032 lithium non-rechargeable, battery life: 4 yr
Backup time	1 year at 25 °C by interruption of power supply
Execution time for 1 KInstruction	0.3 ms for event and periodic task
Execution time per instruction	0.2 µs Boolean
Exct time for event task	60 µs response time
Clock drift	<= 30 s/month at 25 °C
Regulation loop	Adjustable PID regulator up to 14 simultaneous loops
Positioning functions	PWM/PLS function 2 channel(s) (positioning frequency: 100 kHz)
Control signal type	Single phase signal at 100 kHz for fast input (HSC mode) Pulse/Direction signal at 100 kHz for fast input (HSC mode) A/B signal at 50 kHz for fast input (HSC mode)
Counting input number	4 fast input (HSC mode) (counting frequency: 100 kHz), counting capacity: 32 bits
Integrated connection type	Ethernet with connector RJ45 Non isolated serial link "serial 1" with connector RJ45 and interface RS232/RS485 USB port with connector mini B USB 2.0
Supply	Serial serial link supply at 5 V 200 mA
Transmission rate	480 Mbit/s - communication protocol: USB 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m - communication protocol: RS232 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 15 m - communication protocol: RS485
Communication port protocol	Non isolated serial link : Modbus protocol master/slave - RTU/ASCII or SoMachine-Network USB port : USB protocol - SoMachine-Network
Port Ethernet	10BASE-T/100BASE-TX 1 port with 100 m copper cable
Communication service	DHCP client Modbus TCP server Modbus TCP client Modbus TCP slave device
Local signalling	Ethernet network link yellow for Link (Link Status) Ethernet network activity green for ACT 1 LED green for SL 1 LED per channel green for I/O state 1 LED red for BAT 1 LED green for SD card access (SD) 1 LED red for module error (ERR) 1 LED green for RUN 1 LED green for PWR
Electrical connection	Mini B USB 2.0 connector for a programming terminal Connector, 4 terminal(s) for analogue inputs Terminal block, 3 terminal(s) for connecting the 24 V DC power supply Removable screw terminal block for outputs Removable screw terminal block for inputs
Cable length	<= 30 m unshielded cable for output <= 10 m shielded cable for fast input <= 30 m unshielded cable for input
Insulation	Non-insulated between analogue inputs Non-insulated between analogue input and internal logic 500 V AC between output and internal logic Non-insulated between inputs 500 V AC between fast input and internal logic 500 V AC between input and internal logic
Marking	CE
Mounting support	Plate or panel with fixing kit Top hat type TH35-7.5 rail conforming to IEC 60715 Top hat type TH35-15 rail conforming to IEC 60715
Height	70 mm
Depth	70 mm

Width	95 mm
Product weight	0.346 kg

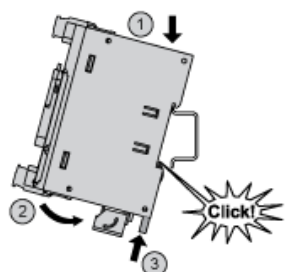
Environment

Standards	EN/IEC 61131-2 EN/IEC 61010-2-201
Product certifications	CSA CULus IACS E10 RCM
Resistance to electrostatic discharge	4 kV on contact conforming to EN/IEC 61000-4-2 8 kV in air conforming to EN/IEC 61000-4-2
Resistance to electromagnetic fields	1 V/m (2 GHz...3 GHz) conforming to EN/IEC 61000-4-3 3 V/m (1.4 GHz...2 GHz) conforming to EN/IEC 61000-4-3 10 V/m (80 MHz...1 GHz) conforming to EN/IEC 61000-4-3
Resistance to magnetic fields	30 A/m at 50...60 Hz conforming to EN/IEC 61000-4-8
Resistance to fast transients	1 kV for serial link conforming to EN/IEC 61000-4-4 1 kV for Ethernet line conforming to EN/IEC 61000-4-4 1 kV for I/O conforming to EN/IEC 61000-4-4 2 kV for relay output conforming to EN/IEC 61000-4-4 2 kV for power lines conforming to EN/IEC 61000-4-4
Surge withstand	1 kV for relay output in differential mode conforming to EN/IEC 61000-4-5 1 kV for power lines (AC) in differential mode conforming to EN/IEC 61000-4-5 0.5 kV for power lines (DC) in differential mode conforming to EN/IEC 61000-4-5 1 kV for shielded cable in common mode conforming to EN/IEC 61000-4-5 1 kV for I/O in common mode conforming to EN/IEC 61000-4-5 2 kV for relay output in common mode conforming to EN/IEC 61000-4-5 2 kV for power lines (AC) in common mode conforming to EN/IEC 61000-4-5 1 kV for power lines (DC) in common mode conforming to EN/IEC 61000-4-5
Resistance to conducted disturbances, induced by radio frequency fields	10 Vrms (spot frequency (2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22, 25 MHz)) conforming to Marine specification (LR, ABS, DNV, GL) 3 Vrms (0.1...80 MHz) conforming to Marine specification (LR, ABS, DNV, GL) 10 Vrms (0.15...80 MHz) conforming to EN/IEC 61000-4-6
Electromagnetic emission	Radiated emissions conforming to EN/IEC 55011 class A 10 m, 230 MHz...1 GHz : 47 dBµV/m QP Radiated emissions conforming to EN/IEC 55011 class A 10 m, 30...230 MHz : 40 dBµV/m QP Conducted emissions conforming to EN/IEC 55011 power lines, 1.5...30 MHz : 63 dBµV/m QP Conducted emissions conforming to EN/IEC 55011 power lines, 150 kHz...1.5 MHz : 79...63 dBµV/m QP Conducted emissions conforming to EN/IEC 55011 power lines, 10...150 kHz : 120...69 dBµV/m QP Conducted emissions conforming to EN/IEC 55011 power lines (AC), 0.5...300 MHz : 73 dBµV/m QP/60 dBµV/m AV Conducted emissions conforming to EN/IEC 55011 power lines (AC), 0.15...0.5 MHz : 79 dBµV/m QP/66 dBµV/m AV
Immunity to microbreaks	10 ms
Ambient air temperature for operation	-10...35 °C for vertical installation -10...55 °C for horizontal installation
Ambient air temperature for storage	-25...70 °C
Relative humidity	10...95 % without condensation in storage 10...95 % without condensation in operation
IP degree of protection	IP20 with protective cover in place
Pollution degree	<= 2
Operating altitude	0...2000 m
Storage altitude	0...3000 m
Vibration resistance	3 gn (vibration frequency: 8.4...150 Hz) on panel mounting 3.5 mm (vibration frequency: 5...8.4 Hz) on panel mounting 3 gn (vibration frequency: 8.4...150 Hz) on symmetrical rail 3.5 mm (vibration frequency: 5...8.4 Hz) on symmetrical rail
Shock resistance	15 gn (test wave duration: 11 ms)

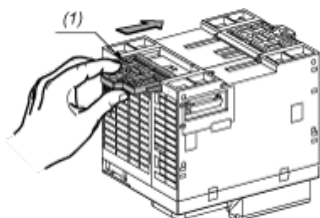
Dimensions



Mounting on a Rail

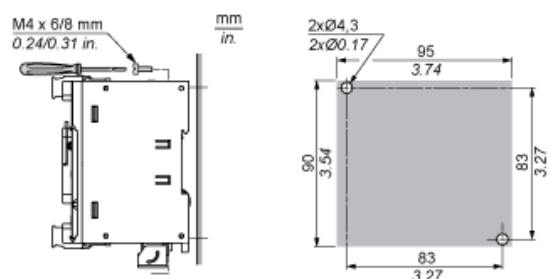


Direct Mounting on a Panel Surface



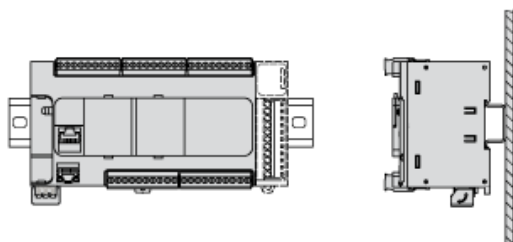
(1) Install a mounting strip

Mounting Hole Layout

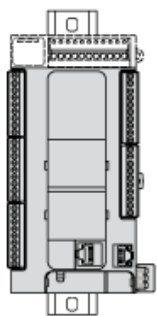


Mounting

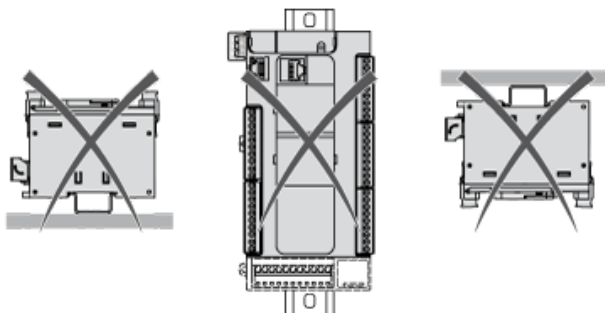
Correct Mounting Position



Acceptable Mounting Position

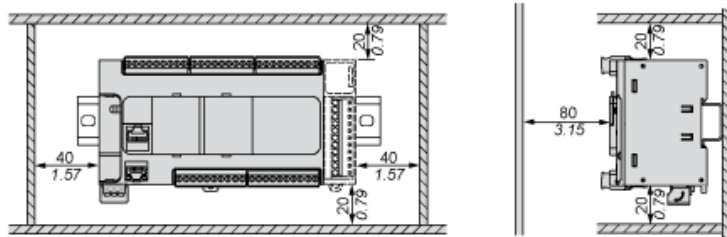


Incorrect Mounting Position

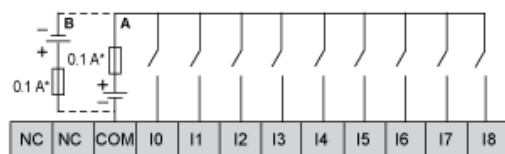


Clearance

mm
in.

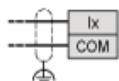


Digital Inputs

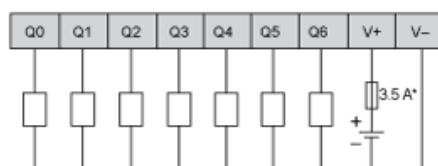


- (*) Type T fuse
(A) Sink wiring (positive logic).
(B) Source wiring (negative logic).

Connection of the Fast Inputs

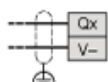


Transistor Output

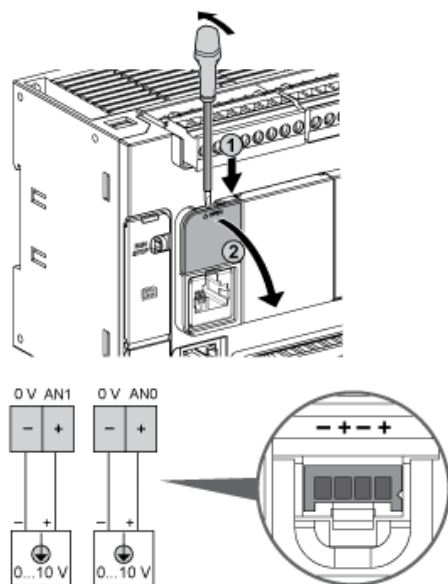


- (*) Type T fuse

Connection of the Fast Outputs



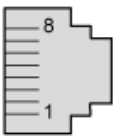
Analog Inputs



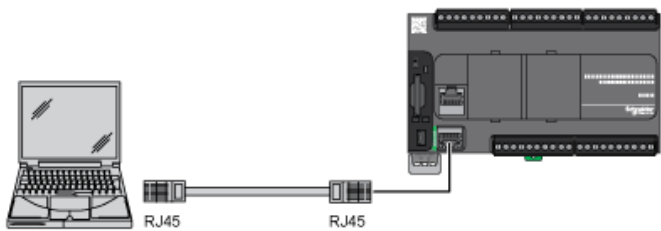
The (-) poles are connected internally.

Pin	Wire Color
0 V	Black
AN1	Red
0 V	Black
AN0	Red

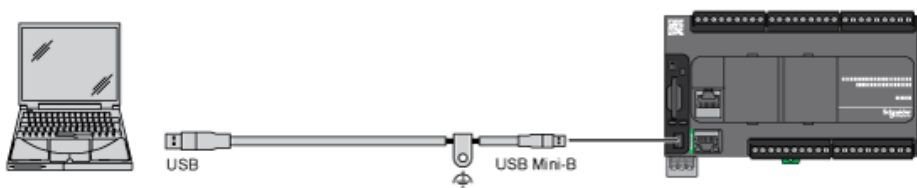
Ethernet Connection



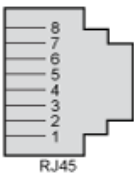
Pin N°	Signal
1	TD+
2	TD-
3	RD+
4	-
5	-
6	RD-
7	-
8	-



USB Mini-B Connection



SL1 Connection

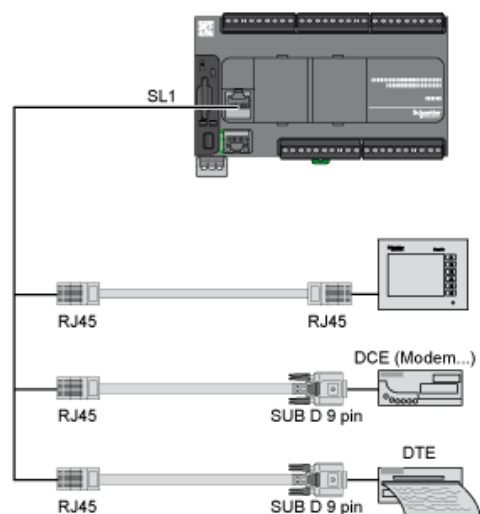


SL1

N °	RS 232	RS 485
1	RxD	N.C.
2	TxD	N.C.
3	RTS	N.C.
4	N.C.	D1 (A+)

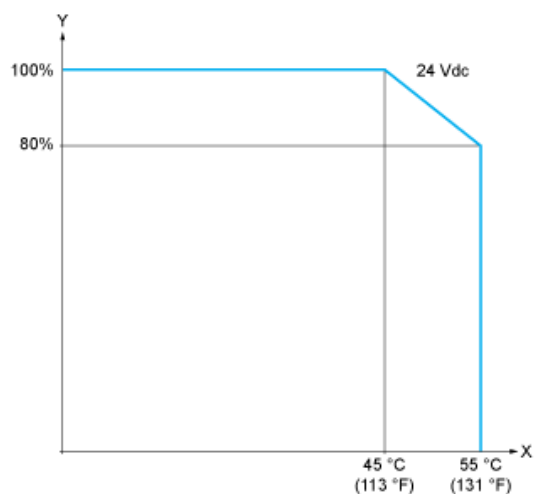
N °	RS 232	RS 485
5	N.C.	D0 (B-)
6	CTS	N.C.
7	N.C.	5 Vdc
8	Common	Common

N.C.: not connected



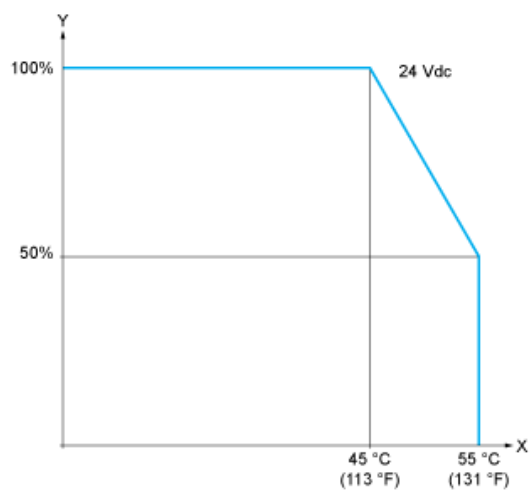
Derating Curves

Embedded Digital Inputs (No Cartridge)



X : Ambient temperature
Y : Input simultaneous ON ratio

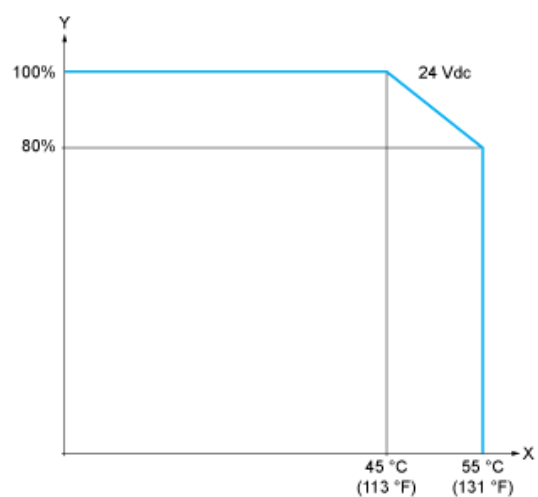
Embedded Digital Inputs (with Cartridge)



X : Ambient temperature
Y : Input simultaneous ON ratio

Derating Curves

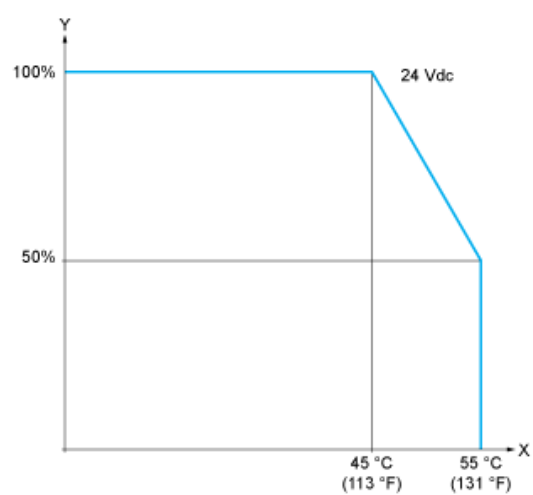
Embedded Digital Outputs (No Cartridge)



X : Ambient temperature

Y : Output simultaneous ON ratio

Embedded Digital Outputs (with Cartridge)



X : Ambient temperature

Y : Output simultaneous ON ratio



Main

Range of product	Phaseo
Product or component type	Power supply
Power supply type	Regulated switch mode
Input voltage	100...240 V AC phase to phase, terminal(s): L1-L2 100...240 V AC single phase, terminal(s): N-L1 120...250 V DC
Output voltage	24 V DC
Rated power in W	30 W
Input protection type	Integrated fuse (not interchangeable)
Power supply output current	1.2 A
Output protection type	Against short-circuits
Ambient air temperature for operation	-25...70 °C without derating

Complementary

Input voltage limits	85...264 V
Network frequency	47...63 Hz
Inrush current	<= 20 A
Cos phi	> 0.5
Efficiency	> 82 %
Output voltage limits	22.2...28.8 V adjustable
Power dissipation in W	6.6 W
Current consumption	0.4 A at 240 V 0.65 A at 100 V
Line and load regulation	+/- 3 %
Residual ripple	250 mV
Holding time	>= 10 ms at 100 V >= 150 ms at 230 V
Connections - terminals	Screw type terminals for input connection, connection capacity: 2 x 0.14...2 x 2.5 mm ² AWG gauge26...14 Screw type terminals for output connection, connection capacity: 4 x 0.14...4 x 2.5 mm ² AWG gauge26...14
Marking	CE
Mounting support	35 x 15 mm symmetrical DIN rail 35 x 7.5 mm symmetrical DIN rail Panel 2 screws, diameter : 4 mm
Operating position	Vertical
Output coupling	Parallel Series
Name of test	Conducted emissions on the power line conforming to EN 55022 Class B Electrostatic discharges conforming to EN/IEC 61000-4-2 Emission conforming to EN 50081-1 Harmonic current emission conforming to EN/IEC61000-3-2 Induced electromagnetic field conforming to EN/IEC 61000-4-6 Primary outage conforming to IEC 61000-4-11 Radiated electromagnetic field conforming to EN/IEC 61000-4-3 Radiated emissions conforming to EN 55022 Class B Rapid transient conforming to IEC 61000-4-4 Surge conforming to EN/IEC 61000-4-5
Status LED	1 LED green for output voltage
Product weight	0.195 kg

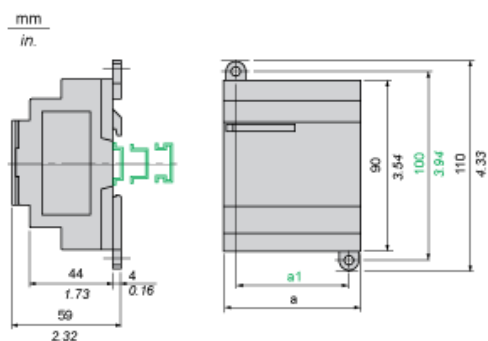
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Environment

Product certifications	CCSAus CSA 22-2 No 950-1 C-Tick CULus 508 TUV 60950-1
Environmental characteristic	EMC conforming to EN 55022 Class B EMC conforming to EN 61000-6-3 EMC conforming to EN/IEC 61000-6-2 EMC conforming to EN/IEC 61204-3 Safety conforming to EN/IEC 60950-1 Safety conforming to SELV
IP degree of protection	IP20 conforming to EN/IEC 60529
Ambient air temperature for storage	-40...70 °C
Relative humidity	0...90 % during operation 0...95 % in storage
Class of protection against electric shock	Class II conforming to VDE 0106-1
Dielectric strength	3000 V between input and output
RoHS EUR status	Compliant
RoHS EUR conformity date	0501

Regulated Switch Mode Power Supplies

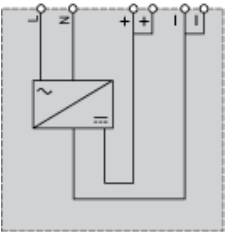
Dimensions



	a in mm	a in in.	a1 in mm	a1 in in.
ABL8MEM05040	54	2.12	42	1.65
ABL8MEM12020	54	2.12	42	1.65
ABL8MEM24003	36	1.41	24	0.94
ABL8MEM24006	36	1.41	24	0.94
ABL8MEM24012	54	2.12	42	1.65
ABL7RM24025	74	2.91	60	2.36

Regulated Switch Mode Power Supply

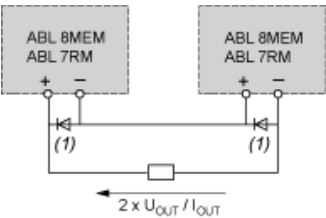
Internal Wiring Diagram



Regulated Switch Mode Power Supplies

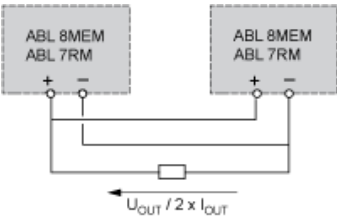
Series or Parallel Connection

Series Connection



(1) Two Schottky diodes I_{min} = power supply I_n and V_{min} = 50 V

Parallel Connection



Family	Series	Parallel
ABL 7RM/8MEM	2 products max.	2 products max.

Series or parallel connection is only recommended for products with identical references.

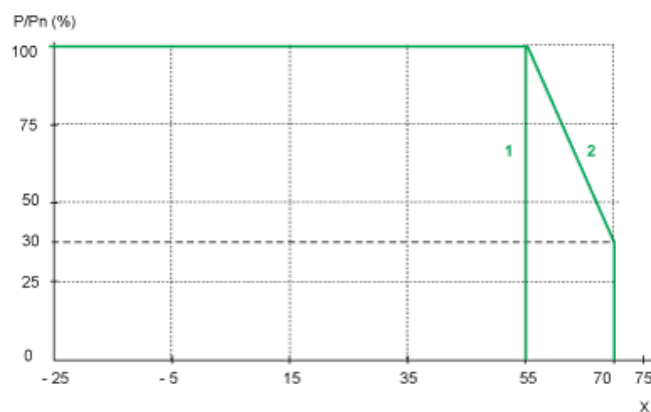
Regulated Switch Mode Power Supplies

Derating

The ambient temperature is a determining factor that limits the power an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced.

The nominal ambient temperature for the Modular range of Phaseo power supplies is 55°C. Above this temperature, derating is necessary up to a maximum temperature of 70°C (except for the ABL7RM24025 model).

The graph below shows the power as a percentage of the nominal power that the power supply can deliver continuously, depending on the ambient temperature.



X Maximum operating temperature ($^{\circ}\text{C}$)

(1) With an ABL7RM24025

(2) With an ABL8MEM.....



Main

Range of product	Magelis STO & STU
Product or component type	Touch panel screen
Software designation	Vijeo Designer
Operating system	Magelis
Processor name	CPU ARM9

Complementary

Display size	5.7 inch
Display type	QVGA TFT colour touchscreen
Display colour	65536 colours
Pixel resolution	320 x 240 pixels
Touch panel	Analogue
Backlight lifespan	50000 hours
Brightness	16 levels
Character font	ASCII Chinese (simplified Chinese) Japanese (ANK, Kanji) Korean Taiwanese (traditional Chinese)
[Us] rated supply voltage	24 V DC
Supply	External source
Supply voltage limits	20.4...28.8 V
Inrush current	<= 30 A
Power consumption	6.8 W
Number of pages	Limited by internal memory capacity
Processor frequency	333 MHz
Memory description	Application memory, 16 MB Back up of data, 64 kB
Integrated connection type	1 USB (V2.0) port mini B USB 1 USB (V2.0) port USB type A COM1 serial link female RJ45, transmission rate <= 115.2 kbits/s (RS232C/RS485) Power supply removable screw terminal block
Realtime clock	Access to the PLC real-time clock
Downloadable protocols	Modbus Modbus TCP/IP Third party protocols Uni-TE
Fixing mode	Ø 22 mm hole
Enclosure material	PC/PBT and PAA
Marking	CE
Height	129.15 mm
Width	163 mm
Depth	56.5 mm

Environment

Immunity to microbreaks	<= 7 ms
Standards	EN 61131-2 FCC Class A IEC 61000-6-2 UL 1604 UL 508
Product certifications	C-Tick CULus UL class 1 Div2 T4A ou T5
Ambient air temperature for operation	0...50 °C
Ambient air temperature for storage	-20...60 °C
Relative humidity	0...85 % without condensation
Operating altitude	<= 2000 m
IP degree of protection	IP20 (rear panel) conforming to IEC 60529 IP65 (front panel) conforming to IEC 60529
NEMA degree of protection	NEMA 4X front panel (indoor use)
Shock resistance	15 gn for 11 ms conforming to IEC 60068-2-27
Vibration resistance	+/- 3.5 mm (f = 5...9 Hz) conforming to IEC 60068-2-6 1 gn (f = 9...150 Hz) conforming to IEC 60068-2-6
Resistance to electromagnetic fields	10 V/m conforming to IEC 61000-4-3



Main

Range of product	Modicon M340 automation platform
Accessory / separate part category	Connection accessories
Accessory / separate part type	Terminal port/USB cordset
Accessory / separate part designation	3.4" small touch screen panel 3.5" small touch screen panel
Accessory / separate part destination	Graphic terminal XBTGT, XBTGK, XBTGTW PC terminal
Range compatibility	Magelis GTO
Cable length	1.8 m

Complementary

Electrical connection	1 connector mini B USB M340 processor 1 connector USB type A
Product weight	0.065 kg

Offer Sustainability

Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 1001 - Schneider Electric declaration of conformity
REACH	Reference contains SVHC above the threshold - go to CaP for more details
Product environmental profile	Available Download Product Environmental
Product end of life instructions	Need no specific recycling operations



Main

Range of product	Altivar
Accessory / separate part category	Connection accessory
Accessory / separate part type	Connecting cable
Product compatibility	Modbus splitter block LU9GC3 TSXCUSB485 TWDNADK70P VW3A8306TF010 VW3A8306TF03
Accessory / separate part destination	Modbus splitter block LU9GC3 Modbus T-junction box Terminal or Modbus network port
Range compatibility	Altistart 22 Altistart 48 Altivar 12 Altivar 21 Altivar 31 Altivar 312 Altivar 61 Altivar 71 Lexium SD3 Zelio Logic Modicon LMC058 Modicon M258 Altivar 32 Altivar 31C Altivar 212 Altivar 61Q Altivar 71Q Modicon M238 Lexium 32i Preventa XPS MF Altivar Easy 310 Altivar Easy 610 Altivar Process ATV600 Altivar Process ATV900 Altivar Machine ATV320
Cable length	1 m
Electrical connection	2 male connectors RJ45

Complementary

Product weight	0.06 kg
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