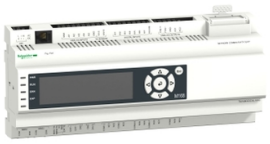
Product data sheet

Specifications



Base Built - in Display M168 - 23 IO - BMS connectivity - for Small Chillers

TM168D23CHL101C

Discontinued on: Jul 31, 2024

Discontinued

Main

Range of Product	Modicon M168 logic controller
Product or Component Type	Base controller
Product Specific Application	Air cooled chiller
Variant	Ready to use without PC
Communication port protocol	BACnet MS/TP, optional BACnet IP, optional Modbus
Input/output number	23
Input/output number	7 discrete input 5 configurable analog input 8 discrete output 1 dedicated PWM output 2 configurable analog output

Complementary

Discrete input number	7
Discrete input logic	Sink or source (positive/negative)
Discrete input voltage	24 V
Discrete input voltage type	AC/DC
Sensor power supply	4.4…5 V DC 18…36 V DC
Input impedance	Discrete input <= 10 kOhm
Network frequency	50-60 Hz +/- 3 Hz discrete input
Discrete output number	5 8 mA) 3 5 mA)
Contacts type and composition	7 NO discrete output 1 C/O discrete output
Minimum load	10 mA 12 V
Discrete output current	8 mA relay output 5 mA relay output
Load current	8 A 5...30 V DC 8 A 24...250 V AC 5 A 5...30 V DC 5 A 24...250 V AC
Mechanical durability	10000000 cycles relay output

Price is “List Price” and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Electrical durability	120000 cycles DC-12 8 A 30 V, 2 A 6000 cycles DC-13 8 A 24 V, 2 A 300 ms 300000 cycles AC-12 8 A 250 V, 2.5 A 6000 cycles AC-15 8 A 250 V, 3 A, cos phi = 0.3 120000 cycles DC-12 5 A 30 V, 2 A 200000 cycles DC-13 5 A 24 V, 1 A 48 ms 300000 cycles AC-12 5 A 250 V, 2.5 A 50000 cycles AC-15 5 A 250 V, 3 A, cos phi = 0.4
Operating rate in Hz	10 Hz - off load discrete output 8 mA 0.1 Hz - operating current discrete output 8 mA 20 Hz - off load discrete output 5 mA 0.1 Hz - operating current discrete output 5 mA
Response time	10 ms closing discrete output 8 mA 5 ms opening discrete output 8 mA 8 ms closing discrete output 5 mA 4 ms opening discrete output 5 mA
Analogue input number	5
Analogue input type	Voltage 0...10 V or 0...5 V ratio 0.01 V Current 0...20 mA/4...20 mA 0.01 mA Temperature probe -50...+120 °C 0.1 °CNTC Temperature probe -50...+150 °C 0.1 °CPTC Temperature probe -100...+200 °C 0.5 °CPt 1000
Analogue output number	2
Analogue output type	Voltage 0...10 V 0.01 V Current 0-20 mA or 4-20 mA 0.05 mA
Load impedance ohmic	>= 1000 Ohm voltage 40...300 Ohm current
Absolute accuracy error	-5 %...+2 % of full scale 1...5 kOhm analog output voltage +/- 2 % of full scale > 5 kOhm analog output voltage +/- 3 % of full scale analog output current +/- 0.5 % of full scale analog input
LSB value	10 mV analog output voltage 0.02 mA analog output current 0.07 °C analog input NTC 0.5 °C analog input Pt 1000 5 mV analog input voltage 0.01 mA analog input current
Communication Service	Open collector synchro on AC power supply
Protection type	Reverse polarity protection analog input voltage Overload protection analog output voltage Reverse polarity protection power supply
[Us] rated supply voltage	20...40 V DC 24 V AC
Supply voltage limits	20.4…27.6 V
Network Frequency	50/60 Hz
Network frequency limits	47…63 Hz
Immunity to microbreaks	10 ms
Maximum power consumption in W	22 W
Power consumption in VA	30 VA 24 V
Memory capacity	544 kB
Realtime clock	With clock, clock drift <= 30 s/month
Data backed up	Date and hour internal battery, 3 days
Number of port	1 Modbus RJ45 slave 1.2...57.6 kbit/s 1 Modbus RJ45 master/slave 1.2...57.6 kbit/s 1 expansion bus terminal block master/slave

Electrical connection	Analog input AI1 to AI5, GND, +5 V, 24 V) 9 1 removable screw terminal block Discrete input DI1 to DI7, COM) 8 1 removable screw terminal block Fan output FAN+, FAN-) 2 1 removable screw terminal block Expansion bus +24 V, GND, CAN-, CAN+) 5 1 removable screw terminal block Power supply L/+, N/-) 2 1 removable screw terminal block Discrete output NO1 to NO3, COM 1-2, COM 3) 5 1 removable screw terminal block Discrete output NO4 to NO7, COM 6-7, COM 4-5) 6 1 removable screw terminal block Discrete output NO8, NC8, COM8) 3 1 removable screw terminal block Analog output AO1, AO2, GND) 3 1 removable screw terminal block
Maximum cable distance between devices	2 twisted pair cables <3280.8 ft (1000 m) expansion bus <98.4 ft (30 m) power supply <328.08 ft (100 m) embedded sensor PS <328.08 ft (100 m) analog input <328.08 ft (100 m) relay digital output <98.4 ft (30 m) configurable analog output <3.3 ft (1 m) PWM analog output <3280.8 ft (1000 m) SL1 bus <3280.8 ft (1000 m) SL2 bus <328.08 ft (100 m) isolated digital input <328.08 ft (100 m) no isolated digital input USB <9.8 ft (3 m) PC programming tool TTL <9.8 ft (3 m) PC programming tool <98.4 ft (30 m) supply for remote display
Display Type	Integrated LCD display
Local signalling	1 LED (green) for PWR 1 LED (green) for RUN 1 LED (red) for alarm status 1 LED (red) for expansion bus 1 LED (red) for user
Mounting Support	35 mm symmetrical DIN rail
Width	9.9 in (251 mm)
Height	5.09 in (129.19 mm)
Depth	2.4 in (61.5 mm)
Net Weight	1.74 lb(US) (0.79 kg)

Environment

Standards	EN/IEC 61000-6-1 EN/IEC 61000-6-3 EN/IEC 60730-1
Product Certifications	CSA 60730-1 UL 60730-1A
Marking	CE
Ambient air temperature for operation	14…131 °F (-10…55 °C) UL 14…140 °F (-10…60 °C)
Ambient Air Temperature for Storage	-22…158 °F (-30…70 °C)
Relative humidity	5…95 % without condensation
IP degree of protection	IP20 IP40 front face:
Pollution degree	2
Overvoltage category	III
Operating altitude	0...6561.68 ft (0...2000 m)
Storage altitude	0…10000 ft (0…3048 m)
Vibration resistance	3.5 mm constant amplitude 5…8.4 Hz) 1 gn constant amplitude 8.4…150 Hz)
Shock resistance	15 gn 11 ms

Ordering and shipping details

Category	22535-M168 HVAC CONTROLLER
Discount Schedule	PC12
GTIN	3595864109510
Returnability	No
Country of origin	IT

Packing Units

Unit Type of Package 1	PCE
Nbr. of units in pkg.	1
Package 1 Height	4.3 in (11.0 cm)
Package 1 Width	6.1 in (15.5 cm)
Package 1 Length	10.2 in (26.0 cm)
Package weight(Lbs)	27.4 oz (776.0 g)

Contractual warranty

Warranty (in months)	18

Environmental Data

Schneider Electric aims to achieve Net Zero status by 2050 through supply chain partnerships, lower impact materials, and circularity via our ongoing “Use Better, Use Longer, Use Again” campaign to extend product lifetimes and recyclability.

Environmental Data explained >

How we assess product sustainability >

Use Longer

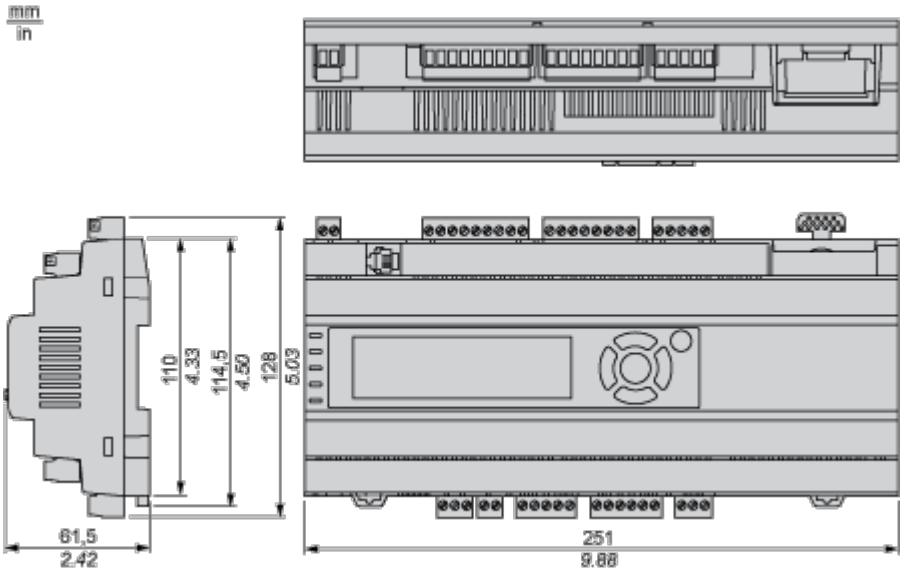
Lifetime extension

Repair	No

Dimensions Drawings

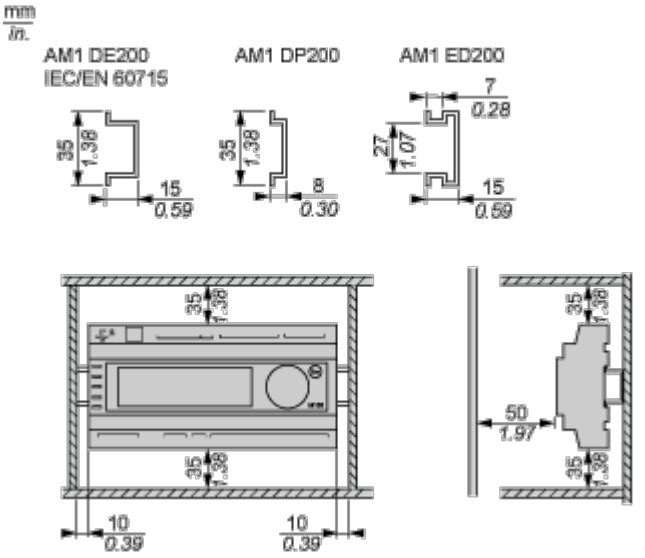
Controller with Communication Slot

Dimensions



Mounting and Clearance

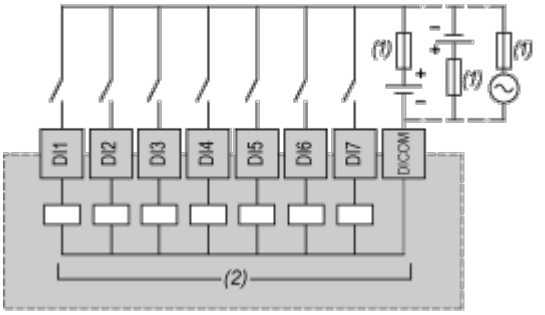
Mounting and Clearance



Connections and Schema

Digital Inputs

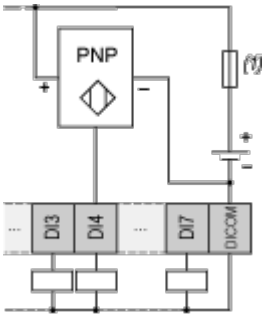
Sink/Source Inputs, External Power



(1) 0.5 A fast-blow fuse

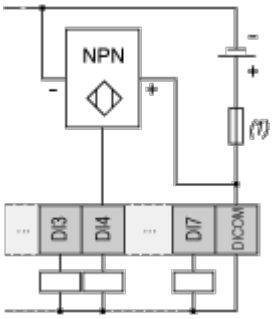
(2) Digital inputs

Connection Example for 3-wire PNP Active Switch



(1) 0.5 A fast-blow fuse

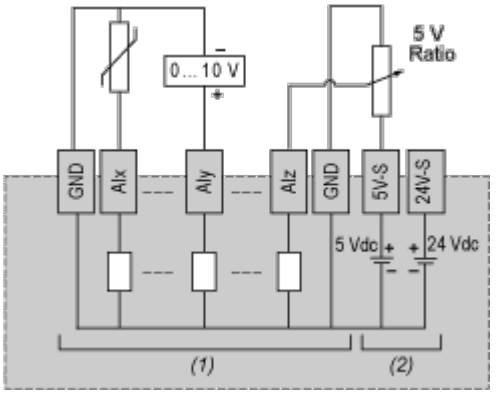
Connection Example for 3-wire NPN Active Switch



(1) 0.5 A fast-blow fuse

Analog Inputs

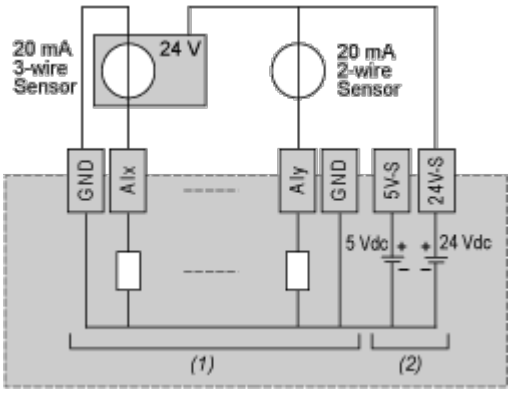
Voltage Mode



(1) Analog inputs

(2) To sensor

Current Mode

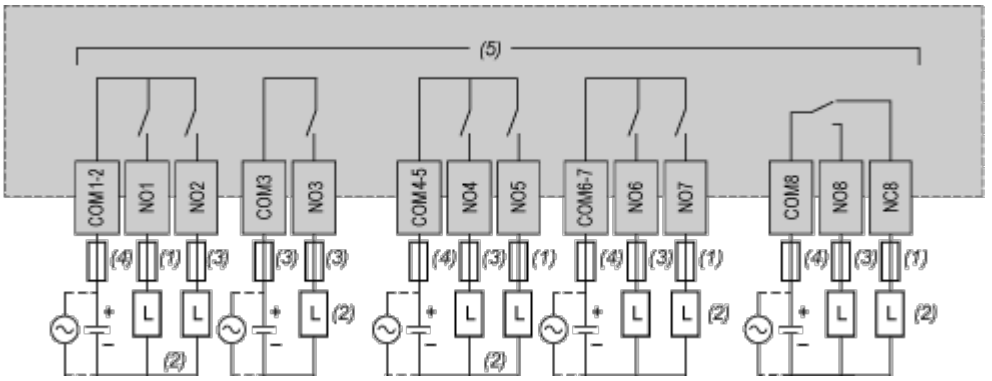


(1) Analog inputs

(2) To sensor

Digital Outputs

Wiring Diagram



(1) 5 A Max fuse

(2) Protection for inductive load

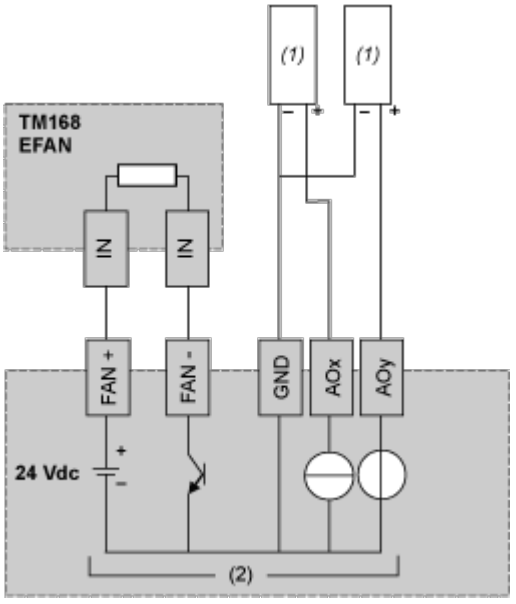
(3) 8 A Max fuse

(4) 10 A Max fuse

(5) Relay outputs

Analog Outputs

Wiring Diagram



(1) Voltage/current actuator

(2) Controller or expansion module analog outputs

Wiring Requirements

Cable Types and Wire Sizes

mm / in				
mm^2	0,08...2,5	0,25...2,5	0,25...1,5	2 x 0,25...2 x 0,75
AWG	28...14	24...14	24...16	2 x 24...2 x 18

Use copper conductors only. Use shielded cables for Modbus.