MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ALLEN-BRADLEY

1762-L40BWA

COMPACT AC RELAY CONTROLLER

Used with the applicable MicroLogix 1200 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Rockwell1762-UM001I-EN-P,05/2024;L40BWA column,pp.73 to 77



MicroLogix 1200 Programmable Controllers

Bulletin 1762 Controllers and Expansion I/O Modules

Allen-Bradley
by ROCKWELL AUTOMATION

User Manual

Original Instructions

Install Your Controller

Installation Considerations

Most applications require installation in an industrial enclosure (Pollution Degree 2[a]) to reduce the effects of electrical interference (Over Voltage Category II[b]) and environmental exposure. Locate your controller as far as possible from power lines, load lines, and other sources of electrical noise such as hard-contact switches, relays, and AC motor drives. For more information on proper grounding guidelines, see the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.



ATTENTION: Electrostatic discharge can damage semiconductor devices inside the controller. Do not touch the connector pins or other sensitive areas.



ATTENTION: Vertical mounting of the controller is not recommended due to heat build-up considerations.



ATTENTION: Be careful of metal chips when drilling mounting holes for your controller or other equipment within the enclosure or panel. Drilled fragments that fall into the controller or I/O modules could cause damage. Do not drill holes above a mounted controller if the protective debris shields are removed or the processor is installed.

Safety Considerations

Safety considerations are an important element of proper system installation. Actively thinking about the safety of yourself and others, as well as the condition of your equipment, is of primary importance. We recommend reviewing the following safety considerations.

Hazardous Location Considerations

This equipment is suitable for use in Class I Division 2, Groups A, B, C, D or non-hazardous locations only. The following WARNING statement applies to use in hazardous locations.



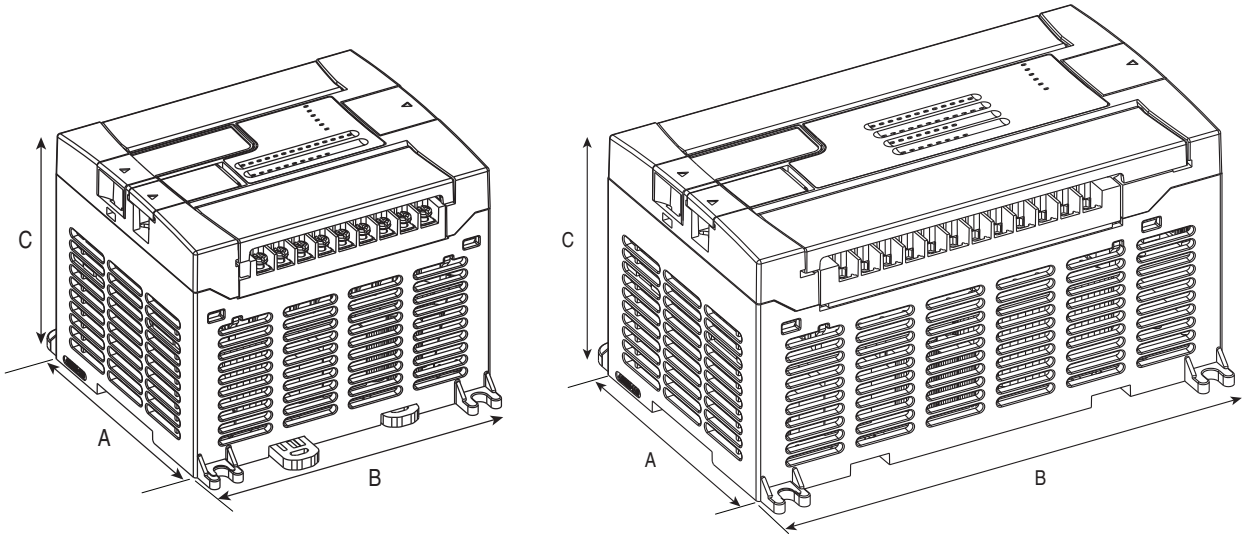
WARNING: EXPLOSION HAZARD

- Substitution of components may impair suitability for Class I Division 2.
- Do not replace components or disconnect equipment unless power has been switched off.
- Do not connect or disconnect components unless power has been switched off.
- This product must be installed in an enclosure. All cables connected to the product must remain in the enclosure or be protected by conduit or other means.
- All wiring must comply with N.E.C. article 501-4(b).
- The interior of the enclosure must be accessible only by the use of a tool.
- For applicable equipment (for example, relay modules), exposure to some chemicals may degrade the sealing properties of the materials used in these devices:
  – Relays, epoxy
  It is recommended that you periodically inspect these devices for any degradation of properties and replace the module if degradation is found.

(a) Pollution Degree 2 is an environment where normally only non-conductive pollution occurs except that occasionally temporary conductivity caused by condensation shall be expected.
(b) Overvoltage Category II is the load level section of the electrical distribution system. At this level, transient voltages are controlled and do not exceed the impulse voltage capability of the products insulation.

Controller Mounting Dimensions

Figure 5 - Controller Dimensions



1762-L24AWA, 1762-L24BWA, 1762-L24BXB
1762-L24AWAR, 1762-L24BWAR, 1762-L24BXBR

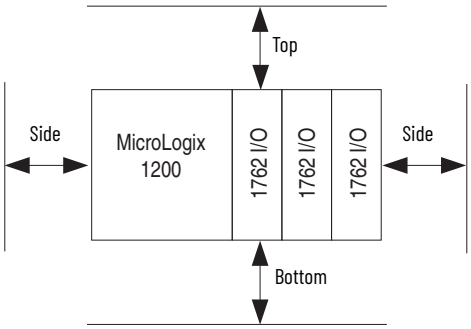
1762-L40AWA, 1762-L40BWA, 1762-L40BXB
1762-L40AWAR, 1762-L40BWAR, 1762-L40BXBR

Dimension	1762-L24AWA 1762-L24AWAR	1762-L24BWA 1762-L24BWAR	1762-L24BXB 1762-L24BXBR	1762-L40AWA 1762-L40AWAR	1762-L40BWA 1762-L40BWAR	1762-L40BXB 1762-L40BXBR
A	90 mm (3.5 in.)			90 mm (3.5 in.)		
B	110 mm (4.33 in.)			160 mm (6.30 in.)		
C	87 mm (3.43 in.)			87 mm (3.43 in.)		

Controller and Expansion I/O Spacing

The controller mounts horizontally, with the expansion I/O extending to the right of the controller. Allow 50 mm (2 in.) of space on all sides of the controller system for adequate ventilation. Maintain spacing from enclosure walls, wireways, and adjacent equipment, as shown in Figure 6.

Figure 6 - Controller and Expansion I/O Spacing



Mount the Controller

MicroLogix 1200 controllers are suitable for use in an industrial environment when installed in accordance with these instructions. Specifically, this equipment is intended for use in clean, dry environments (Pollution degree 2[a]) and to circuits not exceeding Over Voltage Category II[b] (IEC 60664-1)[c].

(a) Pollution Degree 2 is an environment where, normally, only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation shall be expected.
(b) Over Voltage Category II is the load level section of the electrical distribution system. At this level transient voltages are controlled and do not exceed the impulse voltage capability of the product's insulation.
(c) Pollution Degree 2 and Over Voltage Category II are International Electrotechnical Commission (IEC) designations.

Specifications

Controller Specifications

General Specifications

Attribute		1762-L24AWA 1762-L24AWAR	1762-L24BWA 1762-L24BWAR	1762-L24BXB 1762-L24BXBR	1762-L40AWA 1762-L40AWAR	1762-L40BWA 1762-L40BWAR	1762-L40BXB 1762-L40BXBR
Dimensions		Height: 90 mm (3.54 in.), 104 mm (4.09 in.) (with DIN latch open) Width: 110 mm (4.33 in.) Depth: 87 mm (3.42 in.)			Height: 90 mm (3.54 in.), 104 mm (4.09 in.) (with DIN latch open) Width: 160 mm (6.30 in.) Depth: 87 mm (3.42 in.)		
Shipping weight		0.9 kg (2.0 lbs)			1.1 kg (2.4 lbs)		
Number of I/O		14 inputs, 10 outputs			24 inputs, 16 outputs		
Power supply voltage		100...240V AC (-15%, +10%) @ 47...63 Hz		24V DC (-15%, +10%) Class 2, SELV	100...240V AC (-15%, +10%) @ 47...63 Hz		24V DC (-15%, +10%) Class 2, SELV
Heat dissipation		15.2 W	15.7 W	17.0 W	21.0 W	22.0 W	27.9 W
Power supply inrush current		120V AC: 25 A for 8 ms 240V AC: 40 A for 4 ms		24V DC: 15 A for 20 ms	120V AC: 25 A for 8 ms 240V AC: 40 A for 4 ms		24V DC: 15 A for 30 ms
Power supply usage		68VA	70VA	27 W	80VA	82VA	40 W
Power supply output	5V DC	400 mA	400 mA(1)	400 mA	600 mA	600 mA(2)	600 mA
	24V DC	350 mA	350 mA(1)	350 mA	500 mA	500 mA(2)	500 mA
Sensor power output		none	250 mA @ 24V DC AC Ripple < 500 mV peak-to-peak 400 µF max.(1)	none	none	400 mA @ 24V DC AC Ripple < 500 mV peak-to-peak 400 µF max.(2)	none
Input circuit type		120V AC	24V DC sinking/sourcing	24V DC sinking/sourcing	120V AC	24V DC sinking/sourcing	24V DC sinking/sourcing
Output circuit type		Relay	Relay	Relay/FET	Relay	Relay	Relay/FET
Terminal screw torque		0.791 N•m (7 lb•in) rated					

(1) Do not allow the total load power consumed by the 5V DC, 24V DC, and sensor power outputs to exceed 12 W.
(2) Do not allow the total load power consumed by the 5V DC, 24V DC, and sensor power outputs to exceed 16 W.
See System Loading and Heat Dissipation on page 105 for system validation worksheets.

Input Specifications

Attribute	1762-L24AWA 1762-L40AWA 1762-L24AWAR 1762-L40AWAR	1762-L24BWA, 1762-L24BXB, 1762-L40BWA, 1762-L40BXB 1762-L24BWAR, 1762-L24BXBR, 1762-L40BWAR, 1762-L40BXBR	
		Inputs 0...3	Inputs 4 and Higher
On-state voltage range	79...132V AC	14...24V DC (+10% @ 55 °C/131 °F) (+25% @ 30 °C/86 °F)	10...24V DC (+10% @ 55 °C/131 °F) (+25% @ 30 °C/86 °F)
Off-state voltage range	0...20V AC	0...5V DC	
Operating frequency	47...63 Hz	0 Hz...20 kHz	0 Hz...1 kHz (scan time dependent)
On-state current: Minimum Nominal Maximum	 5.0 mA @ 79V AC 12 mA @ 120V AC 16.0 mA @ 132V AC	 2.5 mA @ 14V DC 7.3 mA @ 24V DC 12.0 mA @ 30V DC	 2.0 mA @ 10V Dc 8.9 mA @ 24V Dc 12.0 mA @ 30V DC
Off-state leakage current	2.5 mA max.	1.5 mA min.	
Nominal impedance	12 kΩ @ 50 Hz 10 kΩ @ 60 Hz	3.3 kΩ	2.7 kΩ
Inrush current @ 120V AC, max	250 mA	Not applicable	

Output Specifications

Attribute		1762-L24AWA 1762-L24BWA 1762-L24AWAR 1762-L24BWAR	1762-L24BXB 1762-L24BXBR	1762-L40AWA 1762-L40BWA 1762-L40AWAR 1762-L40BWAR	1762-L40BXB 1762-L40BXBR
Relay and FET Outputs					
Controlled load, max		1440VA	–	1440VA	1440VA
Continuous current, max					
Current per group common		8 A	7.5 A	8 A	8 A
Current per controller	@ 150V max	30 A or total of per-point loads, whichever is less			
	@ 240V max	20 A or total of per-point loads, whichever is less			
Relay Outputs					
Turn on time/Turn off time, min		10 ms(1)			
Relay life - Electrical		See Figure 73			
Relay life - Mechanical		20,000,000 cycles			
Load current, min		10 mA			

(1) Scan time dependent

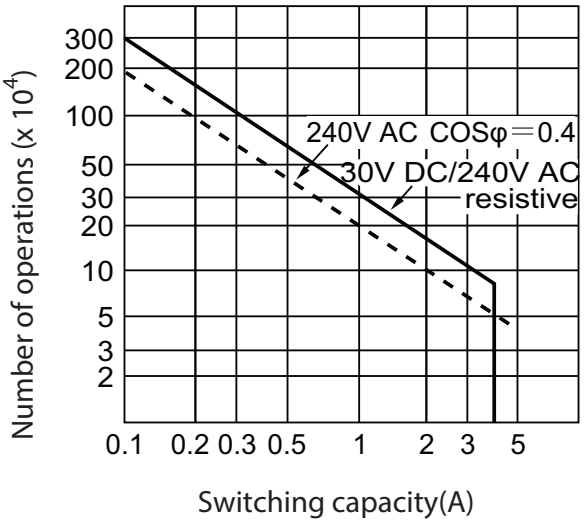
Relay Contact Ratings

Maximum Volts	Amperes		Amperes Continuous	Voltamperes	
	Make	Break		Make	Break
240V AC	7.5 A	0.75 A	2.5 A(1)	1800VA	180VA
120V AC	15 A	1.5 A	2.5 A(1)	1800VA	180VA
125V DC	0.22 A(2)		1.0 A	28VA	
24V DC	1.2 A(2)		2.0 A		

(1) 1.5 A above 40 °C (104 °F).
(2) For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28VA by the applied DC voltage. For example, 28VA/48V DC = 0.58 A. For DC voltage applications less than 14V, the make/break ratings for relay contacts cannot exceed 2 A.

ATTENTION: Do not exceed the "Current per group common" specification.

Figure 73 - Relay Life Chart

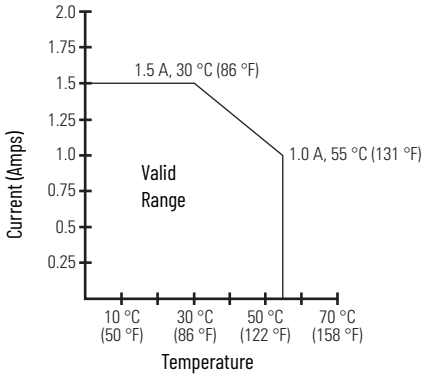


BXB FET Output Specifications

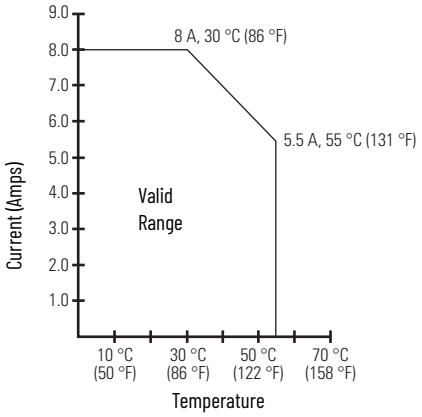
Attribute	General Operation	High Speed Operation[1] (Output 2 Only)
Power supply voltage	24V DC (-15%, +10%)	
On-state voltage drop: At maximum load current At maximum surge current	 1V DC 2.5V DC	 Not applicable Not applicable
Current rating per point: Maximum load Minimum load Maximum leakage	 See graphs below. 1.0 mA 1.0 mA	 100 mA 10 mA 1.0 mA

Maximum output current (temperature dependent):

FET Current per Point
(1762-L24BXB, L40BXB,
1762-L24BXBR, L40BXBR)



FET Total Current
(1762-L40BXB and L40BXBR)



Surge current per point: Peak current Maximum surge duration Maximum rate of repetition @ 30 °C (86 °F) Maximum rate of repetition @ 55 °C (131 °F)	 4.0 A 10 ms Once every second Once every 2 seconds	 Not applicable Not applicable Not applicable Not applicable
Turn-on time, max	0.1 ms	6 µs
Turn-off time, max	1.0 ms	18 µs
Repeatability, max	Not applicable	2 µs
Drift, max	Not applicable	1 µs per 5 °C (41 °F)

(1) Output 2 is designed to provide increased functionality over the other FET outputs. Output 2 may be used like the other FET transistor outputs, but in addition, within a limited current range, it may be operated at a higher speed. Output 2 also provides a pulse train output (PTO) or pulse width modulation output (PWM) function.

AC Input Filter Settings

Nominal Filter Setting (ms)	On-delay (ms)		Off-delay (ms)	
	Minimum	Maximum	Minimum	Maximum
8	2	20	10	20

Fast DC Input Filter Settings (Inputs 0...3)

Nominal Filter Setting (ms)	On-delay (ms)		Off-delay (ms)		Maximum Counter Frequency 50% Duty Cycle
	Minimum	Maximum	Minimum	Maximum	
0.025	0.005	0.025	0.005	0.025	20.0 kHz
0.075	0.040	0.075	0.045	0.075	6.7 kHz
0.100	0.050	0.100	0.060	0.100	5.0 kHz
0.250	0.170	0.250	0.210	0.250	2.0 kHz
0.500	0.370	0.500	0.330	0.500	1.0 kHz
1.00	0.700	1.000	0.800	1.000	0.5 kHz
2.000	1.700	2.000	1.600	2.000	250 Hz

Fast DC Input Filter Settings (Inputs 0...3) (Continued)

Nominal Filter Setting (ms)	On-delay (ms)		Off-delay (ms)		Maximum Counter Frequency 50% Duty Cycle
	Minimum	Maximum	Minimum	Maximum	
4.000	3.400	4.000	3.600	4.000	125 Hz
8.000[1]	6.700	8.000	7.300	8.000	63 Hz
16.000	14.000	16.000	14.000	16.000	31 Hz

(1) This is the default setting.

Normal DC Input Filter Settings (Inputs 4 and Higher)

Nominal Filter Setting (ms)	On-delay (ms)		Off-delay (ms)		Maximum Frequency 50% Duty Cycle
	Minimum	Maximum	Minimum	Maximum	
0.500	0.090	0.500	0.020	0.500	1.0 kHz
1.000	0.500	1.000	0.400	1.000	0.5 kHz
2.000	1.100	2.000	1.300	2.000	250 Hz
4.000	2.800	4.000	2.700	4.000	125 Hz
8.000[1]	5.800	8.000	5.300	8.000	63 Hz
16.000	11.000	16.000	10.000	16.000	31 Hz

(1) This is the default setting.

Working Voltage – 1762-L24AWA, 1762-L40AWA, 1762-L24AWAR, 1762-L40AWAR

Attribute	Value
Power supply input to backplane isolation	Verified by one of the following dielectric tests: 1836V AC for 1 second or 2596V DC for 1 second
	265V AC Working Voltage (IEC Class 2 reinforced insulation)
Input group to backplane isolation	Verified by one of the following dielectric tests: 1517V AC for 1 second or 2145V DC for 1 second
	132V AC Working Voltage (IEC Class 2 reinforced insulation)
Input group to input group isolation	Verified by one of the following dielectric tests: 1517V ACfor 1 second or 2145V DC for 1 second
	132V AC Working Voltage (basic insulation)
Output group to backplane isolation	Verified by one of the following dielectric tests: 1836V AC for 1 second or 2596V DC for 1 second
	265V AC Working Voltage (IEC Class 2 reinforced insulation)
Output group to output group isolation	Verified by one of the following dielectric tests: 1836V AC for 1 second or 2596V DC for 1 second
	265V AC Working Voltage (basic insulation) 150V AC Working Voltage (IEC Class 2 reinforced insulation).

Working Voltage – 1762-L24BWA, 1762-L40BWA, 1762-L24BWAR, 1762-L40BWAR

Attribute	Value
Power supply input to backplane isolation	Verified by one of the following dielectric tests: 1836V AC for 1 second or 2596V AC for 1 second
	265V AC Working Voltage (IEC Class 2 reinforced insulation)
Input group to backplane isolation and input group to input group isolation	Verified by one of the following dielectric tests: 1200V AC for 1 second or 1697V DC for 1 second
	75V DC Working Voltage (IEC Class 2 reinforced insulation)
Output group to backplane isolation	Verified by one of the following dielectric tests: 1836V AC for 1 second or 2596V DC for 1 second
	265V AC Working Voltage (IEC Class 2 reinforced insulation)
Output group to output group isolation	Verified by one of the following dielectric tests: 1836V AC for 1 second or 2596V DC for 1 second
	265V AC Working Voltage (basic insulation) 150V Working Voltage (IEC Class 2 reinforced insulation)

Working Voltage – 1762-L24BXB, 1762-L40BXB, 1762-L24BXBR, 1762-L40BXBR

Attribute	Value
Input group to backplane isolation and input group to input group isolation	Verified by one of the following dielectric tests: 1200V AC for 1 second or 1697V DC for 1 second
	75V DC Working Voltage (IEC Class 2 reinforced insulation)
FET output group to backplane isolation	Verified by one of the following dielectric tests: 1200V AC for 1 second or 1697V DC for 1 second
	75V DC Working Voltage (IEC Class 2 reinforced insulation)

Working Voltage – 1762-L24BXB, 1762-L40BXB, 1762-L24BXBR, 1762-L40BXBR (Continued)

Attribute	Value
Relay output group to backplane isolation	Verified by one of the following dielectric tests: 1836V AC for 1 second or 2596V DC for 1 second
	265V AC Working Voltage (IEC Class 2 reinforced insulation).
Relay output group to relay output group and FET output group isolation	Verified by one of the following dielectric tests: 1836V AC for 1 second or 2596V DC for 1 second
	265V AC Working Voltage (basic insulation) 150V Working Voltage (IEC Class 2 reinforced insulation)

Environmental Specifications

Attribute	1762-L24AWA 1762-L24AWAR	1762-L24BWA 1762-L24BWAR	1762-L24BXB 1762-L24BXBR	1762-L40AWA 1762-L40AWAR	1762-L40BWA 1762-L40BWAR	1762-L40BXB 1762-L40BXBR
Temperature, operating	0…55 °C (32…131 °F) ambient					
Temperature, storage	-40…+85 °C (-40…+185 °F) ambient					
Operating humidity	5…95% relative humidity (non-condensing)					
Vibration	Operating: 10…500 Hz, 5 G, 0.030 in. max. peak-to-peak, 2 hours each axis Relay Operation: 1.5 G					
Shock	Operating: 30 G; 3 pulses each direction, each axis Relay Operation: 7 G Non-Operating: 50 G panel mounted (40 G DIN Rail mounted); 3 pulses each direction, each axis					
Agency certification	UL 508 C-UL under CSA C22.2 no. 142 Class I Div. 2, Groups A, B, C, D (UL 1604, C-UL under CSA C22.2 no. 213) CE/RCM compliant for all applicable directives					
Electrical/EMC	The controller has passed testing at the following levels: EN 61000-4-2: 4 kV contact, 8 kV air, 4 kV indirect EN 61000-4-3: 10V/m, 80 to 1000 MHz, 80% amplitude modulation, +900 MHz keyed carrier EN 61000-4-4: 2 kV, 5 kHz; communications cable: 1 kV, 5 kHz EN 61000-4-5: communications cable 1 kV galvanic gun I/O: 2 kV CM (common mode), 1 kV DM (differential mode) AC Power Supply: 4 kV CM (common mode), 2 kV DM (differential mode) DC Power Supply: 500V CM (common mode), 500V DM (differential mode) EN 61000-4-6: 10V, communications cable 3V					

Expansion I/O Specifications — Discrete I/O Modules

General Specifications – Discrete I/O Modules

Attribute	Value
Dimensions	Height: 90 mm (3.54 in.), 110 mm (4.33 in.) (including mounting tabs) Width: 87 mm (3.43 in.) Depth: 40.4 mm (1.59 in.)
Enclosure type rating	None (open-style)

Input Specifications – 1762-IA8, 1762-IQ8, 1762-IQ16, 1762-IQ32T, 1762-IQ80W6

Attribute	1762-IA8	1762-IQ8	1762-IQ16	1762-IQ32T	1762-IQ80W6
Shipping weight, approx. (with carton)	209 g (0.46 lbs.)	200 g (0.44 lbs.)	230 g (0.51 lbs.)	200g (0.44 lbs.)	280g (0.62 lbs.)
Voltage category	100/120V AC	24V DC (sinking/sourcing)(1)	24V DC (sinking/sourcing)(1)	24V DC (sinking/sourcing)(1)	24V DC (sinking/sourcing)(1)
Operating voltage range	79…132V AC at 47…63 Hz	10…30V DC at 30 °C (86 °F) 10…26.4V DC at 55 °C (131 °F)	10…30V DC 10…26.4V DC(2)(3)	10…30V DC (24 points) at 30 °C (86 °F) 10…26.4V DC (23 points) at 60 °C (140 °F)	10…30V DC at 30 °C (86 °F) 10…26.4V DC at 65 °C (149 °F)
Number of inputs	8	8	16	32	8
Bus current draw, max	50 mA at 5V DC (0.25 W)	50 mA at 5V DC (0.25 W)	70 mA at 5V DC (0.35 W)(3)	170 mA at 5V DC 0 mA at 24V DC	110 mA at 5V DC 80 mA at 24V DC