

# Compact 5000 I/O Modules and EtherNet/IP Adapters

## Catalog Numbers

Digital I/O Modules	5069-IA16, 5069-IB16, 5069-IB16F, 5069-IB16K, 5069-IB6F-3W, 5069-OA16, 5069-OB8, 5069-OB16, 5069-OB16F, 5069-OB16K, 5069-OW4I, 5069-OW16, 5069-OX4I
Analog I/O Modules	5069-IF8, 5069-IY4, 5069-IY4K, 5069-OF4, 5069-OF4K, 5069-OF8
High-speed Counter Module	5069-HSC2xOB4
Safety I/O Modules	5069-IB8S, 5069-IB8SK, 5069-OBV8S, 5069-OBV8SK
Serial Module	5069-SERIAL
Field Potential Distributor	5069-FPD
Address Reserve Module	5069-ARM
EtherNet/IP Adapters	5069-AENTR, 5069-AENTRK, 5069-AEN2TR

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The Compact 5000™ I/O architecture provides a wide range of input and output modules to span many applications, from high-speed digital to process control. The architecture uses Producer/Consumer technology that allows input information and output status to be shared among multiple Logix 5000™ controllers.

Compact 5000 I/O modules are used as local I/O modules in CompactLogix™ 5380 and Compact GuardLogix® 5380 controller systems. The modules are also used as remote I/O modules with CompactLogix 5380, Compact GuardLogix 5380 controllers, and some other Logix 5000 controllers. You use the Studio 5000 Logix Designer® application to configure the modules.

The I/O modules require a removable terminal block (RTB) to connect field-side wiring. RTBs are not included with the I/O modules. You must order RTBs separately.

## Summary of Changes

The publication was revised for the following changes.

Topic	Pages
Changed the 5069-OB16, 5069-OB16F, and 5069-OB16K module specifications to indicate that only the Series B hardware supports Field Power Loss Detection.	30
Changed the 5069-IY4 and 5069-IY4K module wiring diagrams with different devices that are connected to the module.	59, 60, 64, and 65
Changed the 5069-IB8S and 5069-IB8SK module wiring diagrams to show normally closed contacts, instead of normally open contacts, which are connected to the module.	82...84

## Power Compact 5000 I/O Modules

There are different types of power that are used with Compact 5000 I/O modules.

Power Type	Description	Related Specifications	
		Name	Description
Module (MOD) Power	System-side power that is used to operate a local or remote system. Power passes across a MOD Power bus. Modules draw current from the bus and pass the remaining current to the next module.	MOD Power	Level of MOD Power current that the module draws from the MOD Power bus
		MOD Power Passthrough max	Maximum level of MOD Power current that the module can pass to the next module.
Sensor/ Actuator (SA) Power	Field-side power that some modules use to power field-side devices. Power passes across an SA Power bus. Some modules draw current from the bus and pass the remaining current to the next module. Other modules do not draw current from the bus but do pass the current to the next module. You use 5069-FPD field potential distributors to establish new SA Power buses in a system. <b>IMPORTANT:</b> Remember the following: <ul style="list-style-type: none"> <li>If the system includes DC type modules and AC type modules, you must use a field potential distributor to install them on separate SA Power buses.</li> <li>You cannot install AC type modules directly next to a Compact GuardLogix 5380 controller. You must first install a field potential distributor.</li> </ul>	SA Power	Level of SA Power current that the module draws from the SA Power bus
		SA Power Passthrough max	Maximum level of SA Power current that the module can pass to the next module.
Local Actuator (LA) Power	Field-side power that some Compact 5000 I/O modules use instead of SA power. Modules that use LA power <b>do not use SA power</b> . They only pass SA power to the next to the next I/O module in the system. You must install modules that use LA Power on an SA Power bus with the same module type. For example, you must install a 5069-OB8 module on an SA Power bus that includes DC type modules.	LA Power	Maximum level of LA Power current that you can apply to the module, by channel, group, or module.

For more information on MOD power, SA power, and LA power, see the user manuals that are listed in [Additional Resources on page 137](#).

## Digital I/O Modules

I/O Type	Cat. No.	Description	Pages
AC digital input	5069-IA16	79...264V AC 16-point, input module	4
DC digital input	5069-IB16	10...32V DC 16-point, sinking input module	9
	5069-IB16K	10...32V DC 16-point, conformal coated sinking input module	
	5069-IB16F	10...32V DC 16-point, sinking fast input module	
	5069-IB6F-3W	10...32V DC 6-point, 3-wire, sinking fast input module	14
AC digital output	5069-OA16	85...264V AC 16-point, output module	19
DC digital output	5069-OB8	10...32V DC 8-point, sourcing high-current output module	24
	069-OB16	10...32V DC 16-point, sourcing high-current output module	29
	5069-OB16K	10...32V DC 16-point, conformal coated sourcing output module	
	5069-OB16F	10...32V DC 16-point, sourcing fast output module	
Relay output	5069-OW4I	5...264V AC /125V DC 4-point, isolated normally open relay output module	35
	5069-OW16	5...264V AC/125V DC 16-point, normally open relay output module	40
	5069-OX4I	5...264V AC /125V DC 4-point, isolated normally open/normally closed relay output module	45

## 5069-IA16 Digital 16-point 120/240V AC Input Module

The following figure shows a wiring diagram for the 5069-IA16 module.

### 5069-IA16 Wiring Diagram

#### Channel Connections

The diagram shows devices that are connected to channels 0, 2, 4, 6, 8, and 10. You are not restricted to using only those channels.

You can connect devices to any channel or combination of channels as needed.

#### SA Power

Connections to an external power supply that provides SA Power via the SA Power RTB on one of the following:

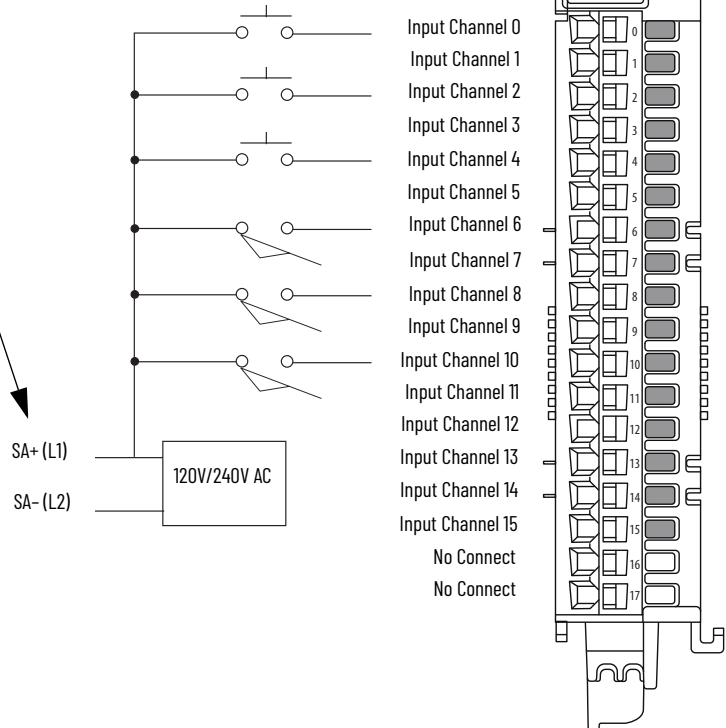
- CompactLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP™ adapter
- 5069-FPD field potential distributor

**IMPORTANT:** Remember the following:

- The 5069-IA16 module uses AC SA power. You must connect AC power to the component, that is, CompactLogix 5380 controller, adapter, or field potential distributor, that provides SA Power to the module.
- If you install a **5069-IA16 module as a local I/O module in a Compact GuardLogix 5380 controller system**, you must install a field potential distributor that has AC power that is connected to it and install the 5069-IA16 module next to the field potential distributor.

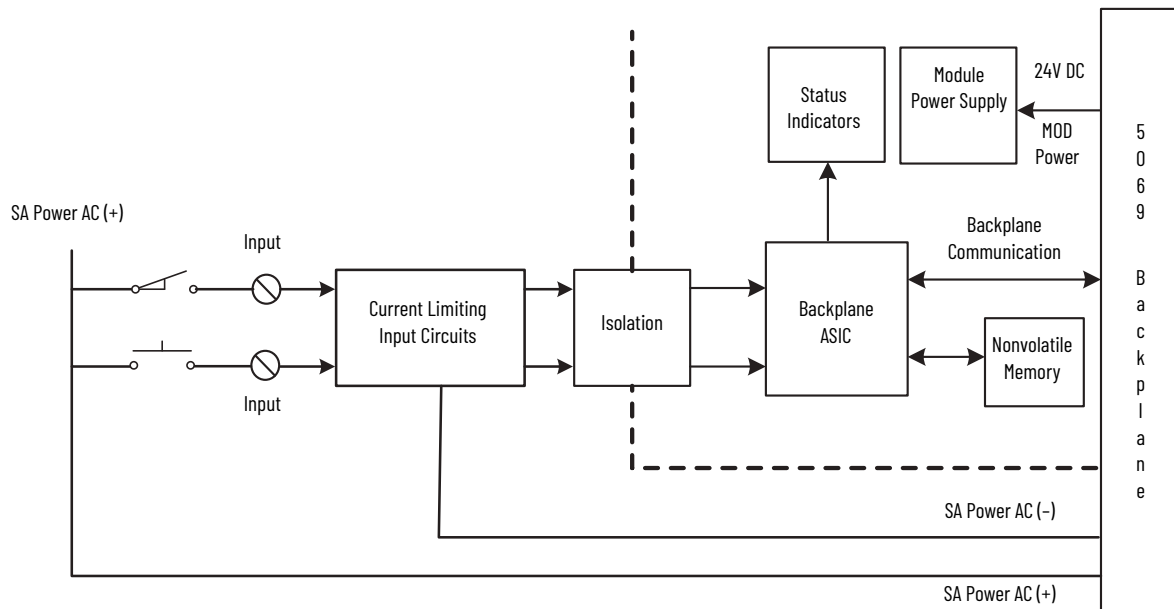
You cannot install modules that draw AC SA power next to a Compact GuardLogix 5380 controller. Compact GuardLogix 5380 controllers do not support AC power on their SA Power RTBs.

- The 5069-IA16 module inputs use a shared common. The inputs have a return through internal module circuitry to the SA (-) terminal on the SA Power RTB.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA Power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a functional block diagram for the 5069-IA16 module.

### 5069-IA16 Functional Block Diagram



### Technical Specifications - 5069-IA16

Attribute	5069-IA16
On-state voltage, min	79V AC
On-state voltage, nom	120/240V AC
On-state voltage, max	264V AC
Off-state voltage, max	40V AC
Input current per channel, max	15 mA @ 264V AC
On-state current, min	2 mA @ 79V AC 3 mA @ 164V AC
On-state current, nom	5 mA @ 120V AC/50 Hz 6 mA @ 120V AC/60 Hz 9 mA @ 240V AC/50 Hz 11 mA @ 240V AC/60 Hz
On-state current, max	15 mA @ 264V AC
Off-state current, max	2 mA
Input impedance, nom	24 kΩ @ 120V AC/50 Hz 20 kΩ @ 120V AC/60 Hz 27 kΩ @ 240V AC/50 Hz 22 kΩ @ 240V AC/60 Hz
Input impedance, min	17.6 kΩ @ 264V AC/63 Hz
Inrush current, max	600 mA
Input delay time	
Off to On	10 ms (typ) @ 0...60 °C (32...140 °F)
On to Off	10 ms (typ) @ 0...60 °C (32...140 °F)

**Technical Specifications - 5069-IA16**

Attribute	5069-IA16
Input filter times	
Off to On	Hardware delay: 10 ms (typ) + filter time User-selectable filter times: <ul style="list-style-type: none"> <li>• 120V AC input - 1 ms</li> <li>• 240V AC input - 1 ms, 2 ms, 5 ms</li> </ul>
On to Off	Hardware delay: 10 ms (typ) + filter time User-selectable filter times: <ul style="list-style-type: none"> <li>• 120V AC input - 10 ms, 20 ms</li> <li>• 240V AC input - 5 ms, 10 ms, 20 ms</li> </ul>

With the 5069-IA16 module, the Logix Designer application lets you choose multiple filter values, including values that are invalid for some input signals. For example, the only valid Off to On filter value when a 120V AC signal is connected to the module is 1 ms. However, you can choose 1 ms, 2 ms, or 5 ms. If you select an invalid input filter value, the module can read signal levels incorrectly. For more information, see the Compact 5000 I/O Digital Modules User Manual, publication [5069-UM004](#).

**General Specifications - 5069-IA16**

Attribute	5069-IA16
Number of inputs	16 (One group of 16)
Voltage category	120/240V AC
Voltage and current ratings	
Input voltage range	79...264V AC
Input voltage frequency	47...63 Hz
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power	240 mA @ 79...264V AC
SA Power Passthrough, max <sup>(2)</sup>	9.975 A @ 79...264V AC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw. The 5069-IA16 module complies to ATEX/IECEx when used at or below 125V AC.	
Power dissipation, max	3.5 W
Thermal dissipation, max	11.9 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type Type tested at 1800V AC for 60 s No isolation between individual channels
Module keying	Electronic keying via programming software
Indicators	1 green/red module status indicator 16 yellow/red I/O status indicators
Slot width	1
Dimensions (HxWxD)	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000™ I/O modules. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N·m (3.5 lb-in)
RTB keying	None
Wire category	2 - input ports 2 - power ports 1 wire per terminal for each signal port

**General Specifications - 5069-IA16**

Attribute	5069-IA16
Wire size	
5069-RTB18-SPRING connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation, single wire connection only.
5069-RTB18-SCREW connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation, single wire connection only.
Insulation stripping length	
5069-RTB18-SPRING connections	10 mm (0.39 in.)
5069-RTB18-SCREW connections	12 mm (0.47 in.)
Weight, approx	175 g (0.39 lb)
Enclosure type rating	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEX temp code	T4
IEC Input Compatibility	Type 1

- (1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

**Environmental Specifications - 5069-IA16**

Attribute	5069-IA16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4

**Environmental Specifications - 5069-IA16**

<b>Attribute</b>	<b>5069-IA16</b>
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±4 kV @ 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Corrosion resistance classification	ISA S71.04 G2

**Certifications - 5069-IA16**

<b>Certification<sup>(1)</sup></b>	<b>5069-IA16</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> <li>EN 61000-6-4; Industrial Emissions</li> </ul>
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.



## 5069-IB16, 5069-IB16K, and 5069-IB16F Digital 16-point Sinking Input Modules

The following figure shows a wiring diagram for the 5069-IB16, 5069-IB16K, and 5069-IB16F modules.

### 5069-IB16, 5069-IB16K, and 5069-IB16F Wiring Diagram

#### Channel Connections

The example shows devices that are connected to channels 0, 3, and 6. You are not restricted to using only those channels. You can connect devices to any channel or combination of channels as needed.

#### SA Power

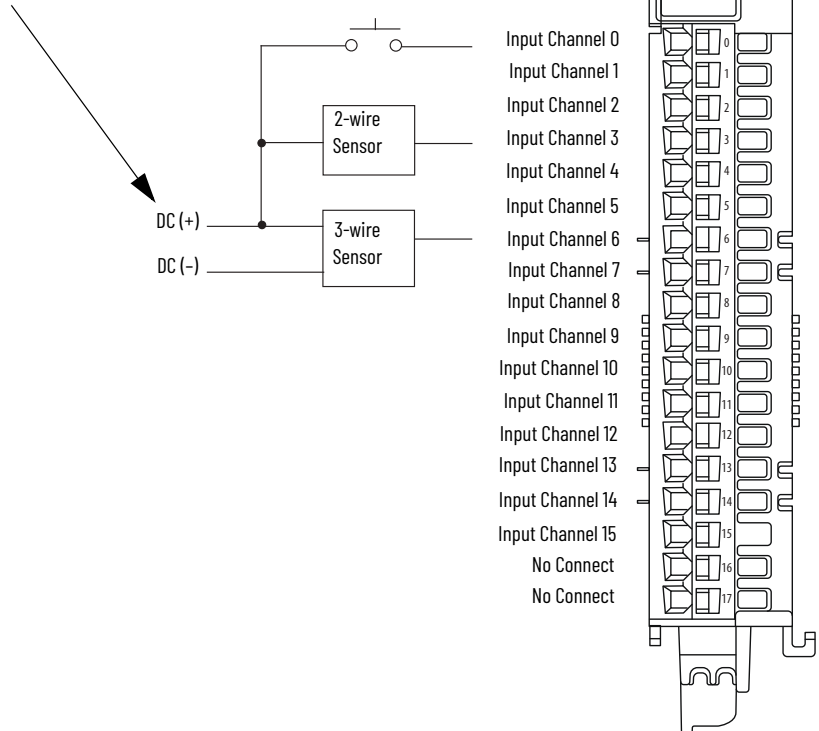
Connections to an external power supply that provides SA power via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- Compact GuardLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

#### IMPORTANT: Remember the following:

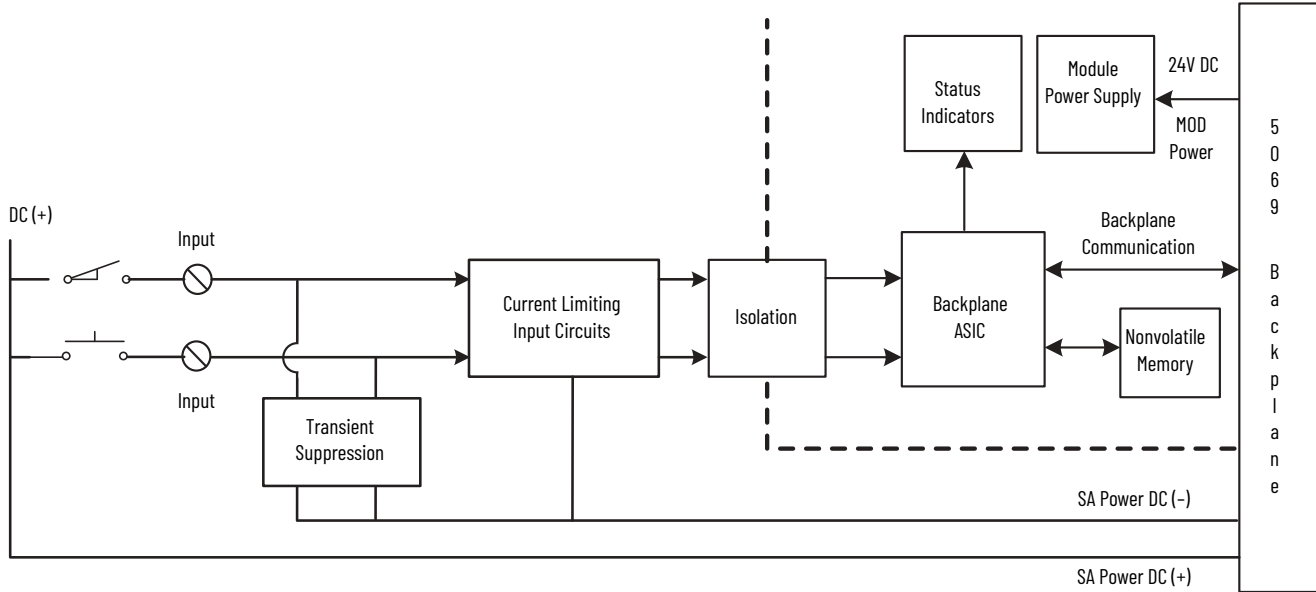
- The 5069-IB16, 5069-IB16K, and 5069-IB16F modules use DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- The 5069-IB16, 5069-IB16K, and 5069-IB16F module inputs use a shared common. The inputs have a return through internal module circuitry to the SA (-) terminal on the SA Power RTB.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.

**IMPORTANT:** The 5069-IB16K and 5069-IB16F modules are wired the same as the wiring diagram that is shown for the 5069-IB16 module.



The following figure shows a functional block diagram for the 5069-IB16, 5069-IB16K, and 5069-IB16F modules.

**5069-IB16, 5069-IB16K, and 5069-IB16F Functional Block Diagram**



**Technical Specifications - 5069-IB16, 5069-IB16K, and 5069-IB16F**

Attribute	5069-IB16, 5069-IB16K	5069-IB16F
On-state voltage, min	10V DC	
On-state voltage, nom	24V DC	
On-state voltage, max	32V DC	
On-state current, min	4 mA @ 10V	
On-state current, nom	6 mA @ 24V DC	
On-state current, max	7.4 mA @ 32V DC	
Off-state voltage, max	5V DC	
Off-state current, max	1.5 mA	
Input impedance, min	1.33 kΩ	
Input impedance, nom	4.1 kΩ	
Input impedance, max	7.0 kΩ	
Inrush current, max	< 250 mA peak (decaying to, 37% in 22 ms, without activation)	
Input delay time (screw to backplane)		
Off to On	≤ 100 μs, ±10 μs @ 25 °C (77 °F)	≤ 10 μs, ±1 μs @ 25 °C (77 °F)
On to Off	≤ 100 μs, ±10 μs @ 25 °C (77 °F)	≤ 10 μs, ±1 μs @ 25 °C (77 °F)
Input drift over temperature span	±100 ns/°C (55.6 ns/°F) from 0...60 °C (32...140 °F)	< 10 ns/°C (5.56 ns/°F) from 0...60 °C (32...140 °F)
Input On to Off minimum pulse width	60 μs	6 μs
Input Off to On minimum pulse width	60 μs	6 μs

**Technical Specifications - 5069-IB16, 5069-IB16K, and 5069-IB16F**

Attribute	5069-IB16, 5069-IB16K	5069-IB16F
Input filter time		
Off to On	Hardware delay: 50 $\mu$ s + filter time User-selectable filter time: 0...50 ms	Hardware delay: 2 $\mu$ s + filter time User-selectable filter time: 0...50 ms
On to Off	Hardware delay: 50 $\mu$ s + filter time User-selectable filter time: 0...50 ms	Hardware delay: 3 $\mu$ s + filter time User-selectable filter time: 0...50 ms
Reverse polarity protection	Yes	
Overvoltage protection, max	36V (fuse protected)	
Pulse and period measurements	Not supported	$\pm 2$ $\mu$ s
Counter frequency	0 - $f_{max}$ = 500 Hz (inv period 2 ms)	0 - $f_{max}$ = 30 kHz (inv period 33.3 $\mu$ s)
Frequency counter	0 - $f_{max}$ = 500 Hz (inv period 2 ms)	0 - $f_{max}$ = 30 kHz (inv period 33.3 $\mu$ s)
Timestamp of inputs	Not supported	$\pm 10$ $\mu$ s accuracy 1 ns resolution
Overrides	Not supported	
Pulse latching	Not supported	Supported
Events	Not supported	Four events supported (triggered by any input or simple counters)
Pattern matching	Not supported	Supported
Extended counters	Not supported	

**General Specifications - 5069-IB16, 5069-IB16K, and 5069-IB16F**

Attribute	5069-IB16, 5069-IB16K	5069-IB16F
Inputs	16 Channels (1 group of 16), sinking	
Voltage category	12/24V DC Sink	
Voltage and current ratings		
Input ratings	4...7.4 mA per channel @ 10...32V DC	
MOD Power	75 mA @ 18...32V DC	
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC	
SA Power	200 mA @ 10...32V DC	
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 10...32V DC	
Power dissipation, max	3.9 W	
Thermal dissipation, max	13.3 BTU/hr	
Isolation voltage	250V (continuous), Basic Insulation Type No isolation between SA Power and input ports No isolation between individual input ports	
Module keying	Electronic keying via programming software	
Indicators	1 green/red module status indicator 16 yellow/red I/O status indicators	
Slot width	1	
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)	
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.	

**General Specifications - 5069-IB16, 5069-IB16K, and 5069-IB16F**

Attribute	5069-IB16, 5069-IB16K	5069-IB16F
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.	
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N-m (3.5 lb-in)	
RTB keying	None	
Wire category <sup>(3)</sup>	2 - input ports 2 - power ports 1 wire per terminal for each signal port	
Wire size		
5069-RTB18-SPRING connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation, single wire connection only.	
5069-RTB18-SCREW connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation, single wire connection only.	
Insulation stripping length	5069-RTB18-SPRING connections: 10 mm (0.39 in.) 5069-RTB18-SCREW connections: 12 mm (0.47 in.)	
Weight, approx	175 g (0.39 lb)	
Enclosure type	None (open-style)	
North American temp code	T4	
ATEX/IECEX temp code	T4	
IECEX temp code	T4	

- (1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-IB16, 5069-IB16K, and 5069-IB16F**

Attribute	5069-IB16, 5069-IB16K, 5069-IB16F
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz

**Environmental Specifications - 5069-IB16, 5069-IB16K, and 5069-IB16F**

<b>Attribute</b>	<b>5069-IB16, 5069-IB16K, 5069-IB16F</b>
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on input ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on input ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on MOD Power port

**Certifications - 5069-IB16, 5069-IB16K, and 5069-IB16F**

<b>Certification<sup>(1)</sup></b>	<b>5069-IB16, 5069-IB16K, 5069-IB16F</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-IB6F-3W Digital 3-wire Sinking Input Module

The following figure shows a wiring diagram for the 5069-IB6F-3W module.

### 5069-IB6F-3W Wiring Diagram

#### Channel Connections

The diagram shows devices that are connected to channels 0 and 2. You are not restricted to using only those channels. You can connect devices to any channel or combination of channels as needed.

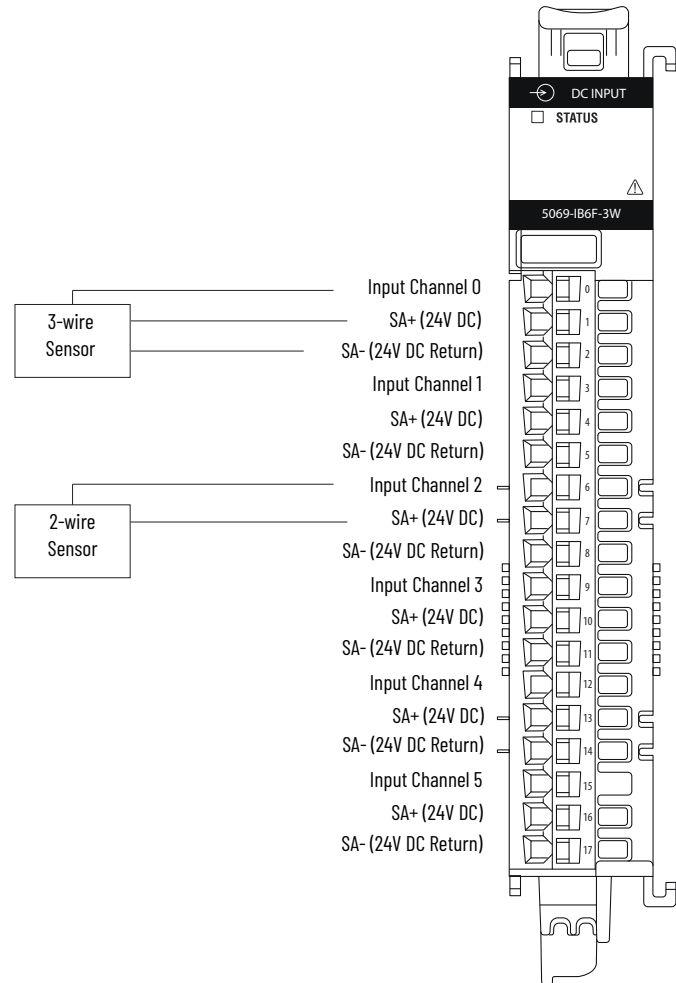
#### SA Power

Connections to an external power supply that provides SA power are made via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- Compact GuardLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

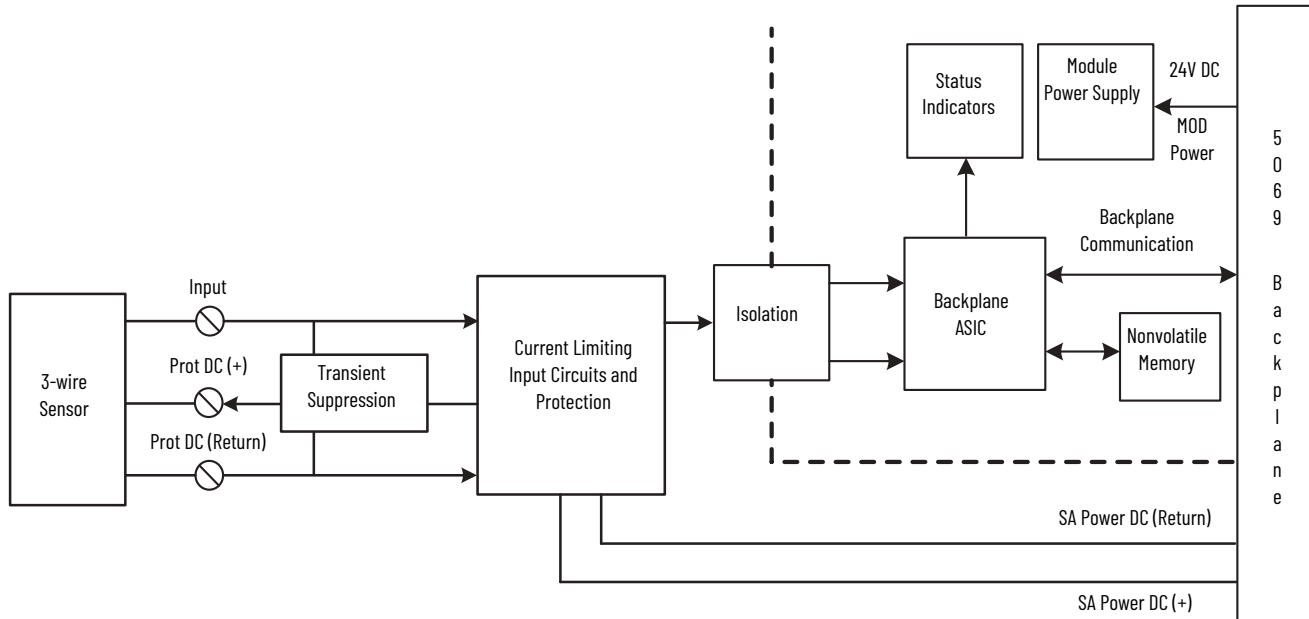
**IMPORTANT:** Remember the following:

- The 5069-IB6F-3W module uses DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the module.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a functional block diagram for the 5069-IB6F-3W module.

### 5069-IB6F-3W Functional Block Diagram



### Technical Specifications - 5069-IB6F-3W

Attribute	5069-IB6F-3W
On-state voltage, min	10V DC
On-state voltage, nom	24V DC
On-state voltage, max	32V DC
Off-state voltage, max	5V DC
On-state current, min	4 mA @ 10V DC
On-state current, nom	6 mA @ 24V DC
On-state current, max	7.4 mA @ 32V DC
Off-state current, max	1.5 mA
Input impedance, nom	4.1 kΩ
Input impedance, max	7.0 kΩ
Inrush current, max	< 250 mA peak (decaying to, 37% in 22 ms, without activation)
Input delay time (screw to backplane)	
Off to On	≤ 10 μs, ±1 μs @ 25 °C (77 °F)
On to Off	≤ 10 μs, ±1 μs @ 25 °C (77 °F)
Input drift over temperature span	±10 ns/°C (5.56 ns/°F) from 0...60 °C (32...140 °F)
Input On to Off minimum pulse width	6 μs
Input Off to On minimum pulse width	6 μs

**Technical Specifications - 5069-IB6F-3W**

Attribute	5069-IB6F-3W
Input filter time	
Off to On	Hardware delay: 2 $\mu$ s + filter time User-selectable filter time: 0...50 ms
On to Off	Hardware delay: 3 $\mu$ s + filter time User-selectable filter time: 0...50 ms
Reverse polarity protection	Yes
Overvoltage protection, max	36V (fuse protected)
Pulse width and period measurements	$\pm$ 2 $\mu$ s
Simple counters Counter frequency	0 - $f_{max}$ = 30 kHz (inv period 33.3 $\mu$ s)
Frequency counter	0 - $f_{max}$ = 30 kHz (inv period 33.3 $\mu$ s)
Timestamp of inputs	$\pm$ 10 $\mu$ s accuracy 1 ns resolution
Overrides	Not supported
Pulse latching	Supported
Events	4 events supported (triggered by any input or simple counters)
Pattern matching	Supported
Extended counters	Not supported

**General Specifications - 5069-IB6F-3W**

Attribute	5069-IB6F-3W
Inputs	6 Channels (1 group of 6), sinking
Voltage category	12/24V DC Sink
Voltage and current ratings	
Input ratings	4...7.4 mA per channel @ 10...32V DC
Output supply ratings	150 mA per channel @ 10...32V DC 900 mA per module @ 10...32V DC
MOD Power	75 mA @ 18V...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power	900 mA @ 10...32V DC
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 10...32V DC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw.	
Power dissipation, max	2.4 W
Thermal dissipation, max	8.1 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type No isolation between SA Power and input ports No isolation between individual input ports
Module keying	Electronic, module keying, software configurable
Indicators	1 green/red module status indicator 6 yellow/red I/O status indicators
Slot width	1
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.



**General Specifications - 5069-IB6F-3W**

Attribute	5069-IB6F-3W
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N•m (3.5 lb•in)
RTB keying	None
Wire category <sup>(3)</sup>	2 - input ports 2 - power ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SPRING removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation, single wire connection only.
5069-RTB18-SCREW removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation, single wire connection only.
Insulation stripping length	
5069-RTB18-SPRING removable terminal block	10 mm (0.39 in.)
5069-RTB18-SCREW removable terminal block	12 mm (0.47 in.)
Weight, approx	175 g (0.39 lb)
Enclosure type rating	None (Open - style)
North American temp code	T4
ATEX/IECEX temp code	T4
IECEX temp code	T4

- (1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-IB6F-3W**

Attribute	5069-IB6F-3W
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max.	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)

**Environmental Specifications - 5069-IB6F-3W**

Attribute	5069-IB6F-3W
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharge 8 kV air discharge
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on input ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on input ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on MOD Power port

**Certifications - 5069-IB6F-3W**

Certification <sup>(1)</sup>	5069-IB6F-3W
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-0A16 Digital 16-point 120/240V AC Output Module

The following figure shows a wiring diagram for the 5069-0A16 module.

### 5069-0A16 Wiring Diagram

#### Channel Connections

The diagram shows devices that are connected to channels 0, 4, 8, and 12. You are not restricted to using only those channels.

You can connect devices to any channel or combination of channels as needed.

#### SA Power

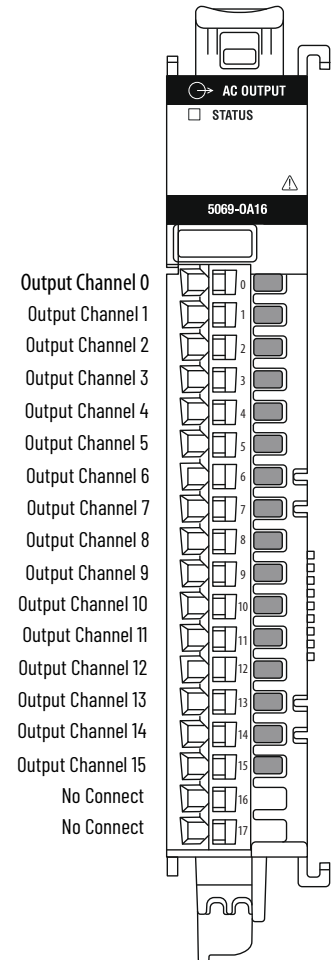
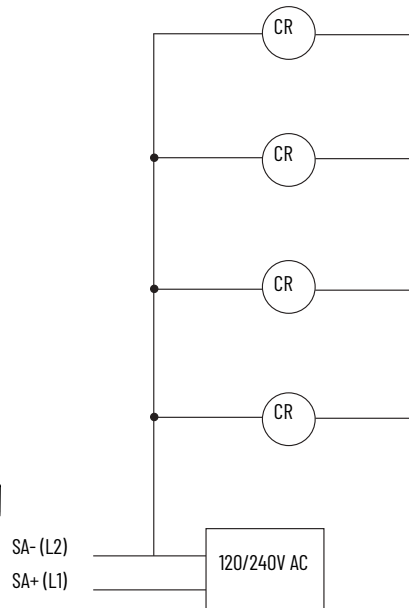
Connections to an external power supply that provides SA Power via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP adapter
- 5069-FPD field potential distributor

**IMPORTANT:** The 5069-0A16 module uses AC SA power. You must connect AC power to the component, that is, CompactLogix 5380 controller, adapter, or field potential distributor, that provides SA Power to the module.

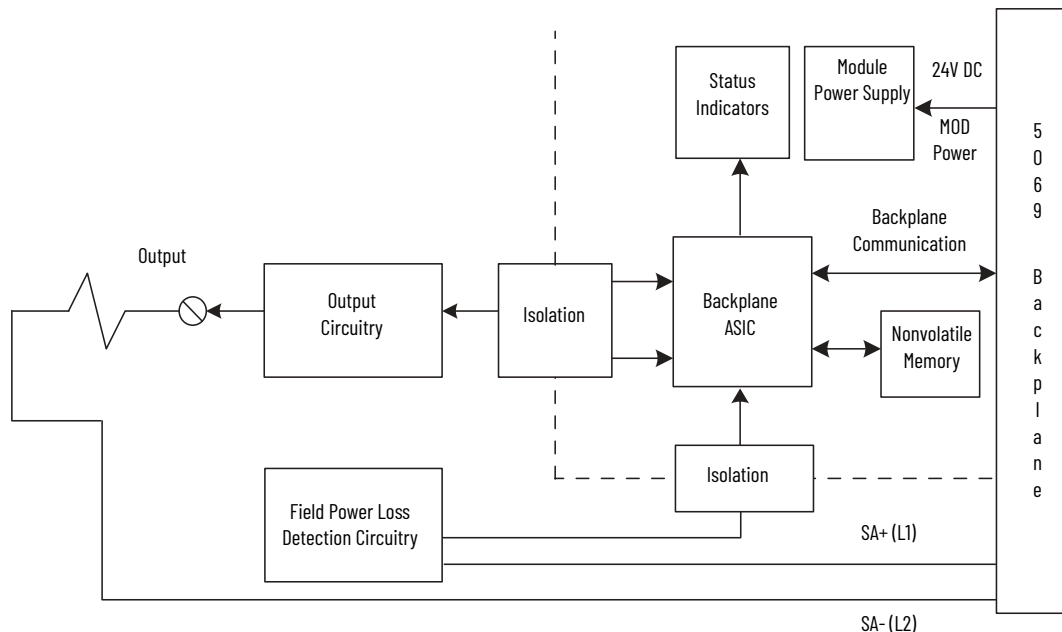
If you install a **5069-0A16 module as a local I/O module in a Compact GuardLogix 5380 controller system**, you must install a field potential distributor that has AC power that is connected to it and install the 5069-0A16 module next to it. You cannot install modules that draw AC SA power next to a Compact GuardLogix 5380 controller. Compact GuardLogix 5380 controllers do not support AC power on their SA Power RTBs.

- The 5069-0A16 module outputs use a shared common. The outputs have a return through internal module circuitry to the SA (-) terminal on the SA Power RTB.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA Power buses.
- You use the 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a functional block diagram for the 5069-0A16 module.

**5069-0A16 Functional Block Diagram**



**Technical Specifications - 5069-0A16**

Attribute	5069-0A16
On-state voltage, min	85V AC
On-state voltage, nom	120/240V AC
On-state voltage, max	264V AC
On-state voltage drop, max	1.5V AC @ 0.5 A
Output current per channel, max	0.5 A
Output current per module, max	4 A
Off-state leakage current, max <sup>(1)</sup>	1 mA
Surge current per point	5 A max for 25 ms per point, repeatable every 2 s
Output delay time (backplane to screw)	
Off to On	1/2 cycle time (typ) @ 0...60 °C (32...140 °F)
On to Off	1/2 cycle time (typ) @ 0...60 °C (32...140 °F)
Field power loss detection	Yes
No load detection diagnostics	Not supported
Output short circuit/overload/overtmp detection	Not supported
Output short circuit/overload protection	Not supported
Reverse polarity protection	Not supported
Overvoltage protections, max	Not supported
Scheduled outputs	Not supported
Pilot duty rating	Resistive/General Pilot Duty 0.5 A pilot duty
Output control in fault state per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>

**Technical Specifications - 5069-0A16**

Attribute	5069-0A16
Output states in program mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>
Output states in fault mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>
Duration of fault mode per point	<ul style="list-style-type: none"> <li>• 1 s</li> <li>• 2 s</li> <li>• 5 s</li> <li>• 10 s</li> <li>• Forever (default)</li> </ul>

(1) Recommended Loading Resistor - To limit the effects of leakage current through solid-state outputs, you can connect a loading resistor in parallel with your load. For 120V AC operation, use a 15 kΩ, 2 W resistor. For 240V AC operation, use a 15 kΩ, 5 W resistor.

**General Specifications - 5069-0A16**

Attribute	5069-0A16
Number of outputs	16 (One group of 16)
Voltage category	120/240V AC
Voltage and current ratings	
Output voltage range	85...264V AC
Output voltage frequency	47...63 Hz
MOD Power	100 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power	4 A @ 85...264V AC
SA Power Passthrough, max <sup>(2)</sup>	9.975 A @ 85...264V AC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw. The 5069-0A16 module complies to ATEX/IECEx when used at or below 125V AC.	
Power dissipation, max	3.4 W
Thermal dissipation, max	11.6 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type Type tested at 1800V AC for 60 s No isolation between individual channels
Module keying	Electronic keying via programming software
Indicators	1 green/red module status indicator 16 yellow/red I/O status indicators
Slot width	1
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.

**General Specifications - 5069-0A16**

Attribute	5069-0A16
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N·m (3.5 lb-in)
RTB keying	None
Wire category	2 - output ports 2 - power ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SCREW connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation, single wire connection only.
5069-RTB18-SPRING connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation, single wire connection only.
Insulation stripping length	
5069-RTB18-SPRING connections	10 mm (0.39 in.)
5069-RTB18-SCREW connections	12 mm (0.47 in.)
Weight, approx	175 g (0.39 lb)
Enclosure type rating	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

- (1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

**Environmental Specifications - 5069-0A16**

Attribute	5069-0A16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g

**Environmental Specifications - 5069-0A16**

<b>Attribute</b>	<b>5069-0A16</b>
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±4 kV @ 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Corrosion resistance classification	ISA S71.04 G2

**Certifications - 5069-0A16**

<b>Certification<sup>(1)</sup></b>	<b>5069-0A16</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> <li>EN 61000-6-4; Industrial Emissions</li> </ul>
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul> When used at or below 125V DC or 30V DC
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-0B8 Digital 8-point 24V DC Output Module

The following figure shows a wiring diagram for the 5069-0B8 module.

### 5069-0B8 Wiring Diagram

#### Channel Connections

The diagram shows devices that are connected to channels 0 and 3. You are not restricted to using only those channels. You can connect devices to any channel or combination of channels as needed.

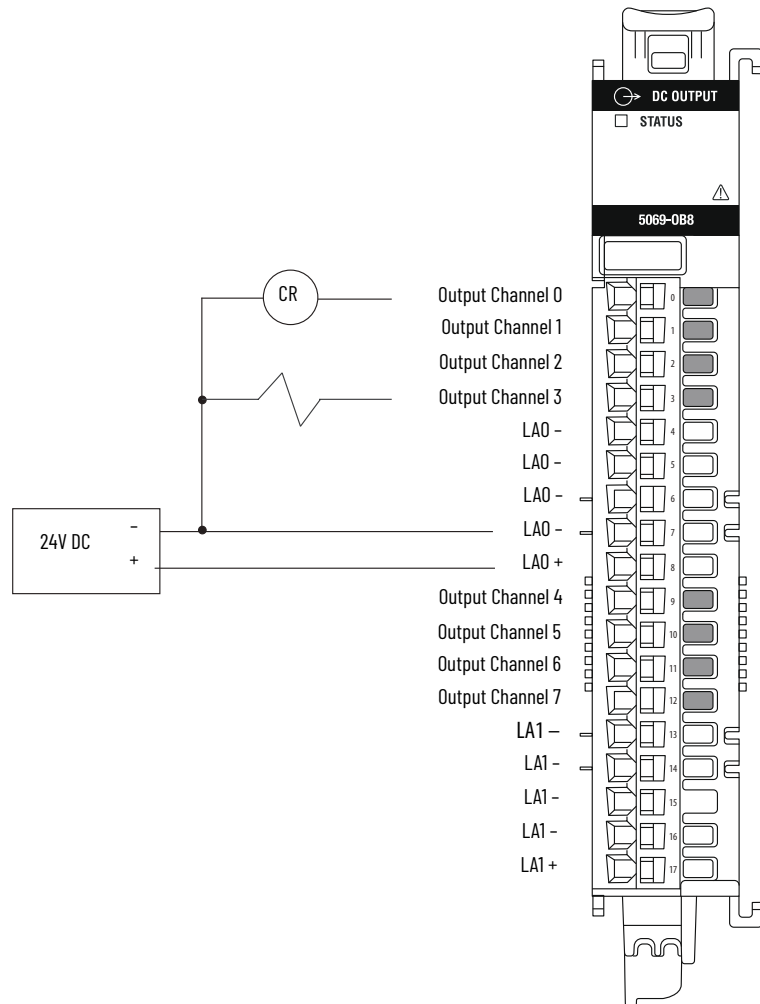
#### LA Power

The Local Actuator (LA+ and LA-) connections are used to supply field-side power to the module. Output channels 0...3 use LA0 +/-, and output channels 4...7 use LA1 +/-.

The 5069-0B8 module **does not draw current from the SA power bus.**

Still, the module is a DC-type module, and you must install it on a DC SA Power bus.

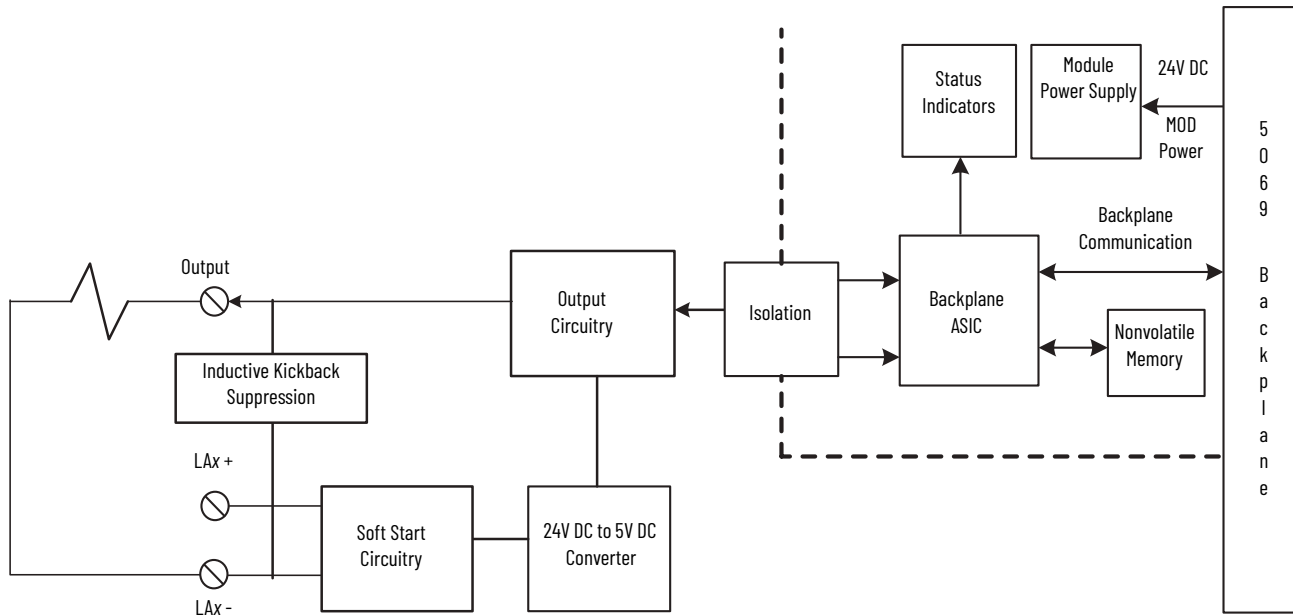
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA Power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.





The following figure shows a functional block diagram for the 5069-0B8 module.

### 5069-0B8 Functional Block Diagram



### Technical Specifications - 5069-0B8

Attribute	5069-0B8
On-state voltage, min <sup>(1)</sup>	10V DC
On-state voltage, nom <sup>(1)</sup>	24V DC
On-state voltage, max <sup>(1)</sup>	32V DC
On-state voltage drop, max <sup>(1)</sup>	0.25V DC
Off-state voltage, max <sup>(1)</sup>	< 10V DC
Off-state voltage, max <sup>(1)</sup>	5V DC
On-state current per channel, min <sup>(1)</sup>	1 mA
Off-state leakage current per point, max <sup>(2)</sup>	0.5 mA
Output current per channel, max	2 A
Output current per group, max	8 A
Output current per module, max	16 A
Surge current per point	4 A max for 10 ms per point, repeatable every 2 s
Output delay time (backplane to screw)	
Off to On	≤ 100 μs @ 25 °C (77 °F) @ 2 A
On to Off	≤ 100 μs @ 25 °C (77 °F) @ 2 A
Pulse width, min	≤ 200 μs T <sub>on</sub> min + T <sub>off</sub> min @ 2 A @ 25 °C (77 °F)
Output drift over temperature span	±100 ns/°C (55.6 n/°F) from 0...60 °C (32...140 °F) @ 2 A
Field power loss detection	Yes
No load detection diagnostics	Yes (per channel diagnostics)
Output short circuit/overload/overtemp detection	Yes (per channel diagnostics)
Output short circuit/overload protection	Yes
Reverse voltage protection	Yes
Overtoltage protection, max	36V (fuse protected)
Pilot duty rating	Resistive/General Pilot Duty 2 A pilot duty
Output control in fault state per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>

**Technical Specifications - 5069-0B8**

Attribute	5069-0B8
Output states in program mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>
Output states in fault mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>
Duration of fault mode per point	<ul style="list-style-type: none"> <li>• 1 s</li> <li>• 2 s</li> <li>• 5 s</li> <li>• 10 s</li> <li>• Forever (default)</li> </ul>

(1) Local Actuator (LA) Field Power related attributes.

(2) Recommended Loading Resistor - To limit the effects of leakage current through solid-state outputs, you can connect a loading resistor in parallel with your load. For 24V DC operation, use a 5.6 K $\Omega$ , 0.5 W resistor for transistor outputs.

**General Specifications - 5069-0B8**

Attribute	5069-0B8
Number of outputs	8 (Two groups of 4)
Voltage category	24V DC
Voltage and current ratings	
Output voltage range	10...32V DC
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
LA Power	2 A per channel @ 10...32V DC 8 A per group @ 10...32V DC 16 A per module @ 10...32V DC
SA Power Passthrough, max <sup>(2)</sup> The module does not draw SA Power current.	9.95 A @ 10...32V DC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw.	
Power dissipation, max	3.2 W
Thermal dissipation, max	10.9 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type Type tested at 1800V AC for 60 s No isolation between LA power and output ports No isolation between individual output ports
Module keying	Electronic keying via programming software
Indicators	1 green/red module status indicator 8 yellow/red I/O status indicators
Slot width	1
Dimensions (HxWxD)	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.

**General Specifications - 5069-0B8**

Attribute	5069-0B8
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N·m (3.5 lb-in)
RTB keying	None
Wire category	2 - output ports 2 - power ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SPRING connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation, single wire connection only.
5069-RTB18-SCREW connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation, single wire connection only.
Insulation stripping length	
5069-RTB18-SPRING connections	10 mm (0.39 in.)
5069-RTB18-SCREW connections	12 mm (0.47 in.)
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N·m (3.5 lb-in)
Weight, approx	175 g (0.39 lb)
Enclosure type rating	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

- (1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

**Environmental Specifications - 5069-0B8**

Attribute	5069-0B8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz

**Environmental Specifications - 5069-0B8**

<b>Attribute</b>	<b>5069-0B8</b>
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±4 kV @ 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Corrosion resistance classification	ISA S71.04 G2

**Certifications - 5069-0B8**

<b>Certification<sup>(1)</sup></b>	<b>5069-0B8</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-OB16, 5069-OB16K, and 5069-OB16F Digital 16-point Sourcing Output Modules

The following figure shows a wiring diagram for the 5069-OB16, 5069-OB16K, and 5069-OB16F modules.

### 5069-OB16, 5069-OB16K, and 5069-OB16F Wiring Diagram

#### Channel Connections

The diagram shows devices that are connected to channels 0, 2, 4, and 6. You are not restricted to using only those channels.

You can connect devices to any channel or combination of channels as needed.

#### LA Power

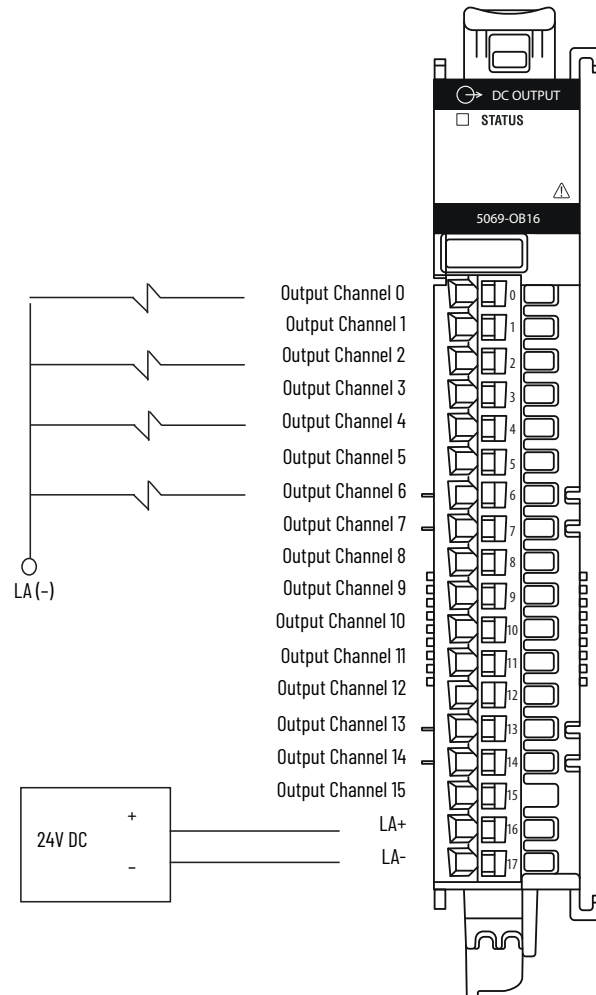
The Local Actuator (LA+ and LA-) connections are used to supply field-side power to the module.

The 5069-OB16, 5069-OB16K, and 5069-OB16F modules **do not draw current from the SA Power bus.**

Still, the modules are DC type modules, and you must install them on a DC SA Power bus.

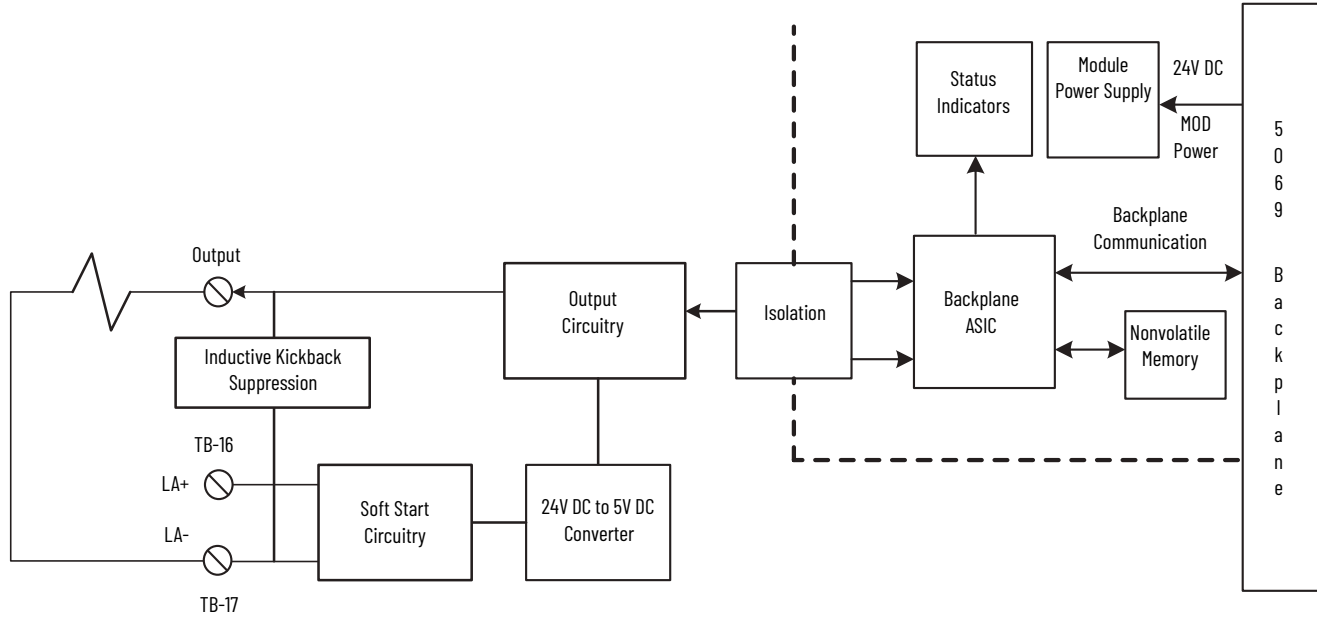
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA Power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.

**IMPORTANT:** The 5069-OB16K and 5069-OB16K modules are wired the same as the wiring diagram that is shown for the 5069-OB16 module.



The following figure shows a functional block diagram for the 5069-OB16, 5069-OB16K, and 5069-OB16F modules.

**5069-OB16, 5069-OB16K, and 5069-OB16F Functional Block Diagram**



**Technical Specifications - 5069-OB16, 5069-OB16K, and 5069-OB16F**

Attribute	5069-OB16, 5069-OB16K	5069-OB16F
On-state voltage, min <sup>(1)</sup>	10V DC	
On-state voltage, nom <sup>(1)</sup>	24V DC	
On-state voltage, max <sup>(1)</sup>	32V DC	
On-state voltage drop, max <sup>(1)</sup>	< 0.2V DC	
On-state current per channel, min <sup>(1)</sup>	1 mA	
Off-state voltage, max <sup>(1)</sup>	5V DC with 1 mA min load	
Off-state leakage current per point, max <sup>(2)</sup>	< 0.5 mA per point	
Output current rating	0.5 A resistive per channel @ 10...32V DC 8 A resistive per module @ 10...32V DC, max	
Surge current per point	1 A max for 10 ms per point, repeatable every 2 s	
Output delay time (backplane to screw)		
Off to On	≤ 100 μs, ±10 μs @ 25 °C (77 °F) @ 0.5 A	10 μs, ±1 μs @ 25 °C (77 °F) @ 0.5 A
On to Off	≤ 100 μs, ±10 μs @ 25 °C (77 °F) @ 0.5 A	10 μs, ±1 μs @ 25 °C (77 °F) @ 0.5 A
Pulse width, min	200 μs @ 0.5 A @ 25 °C (77 °F)	20 μs @ 0.5 A @ 25 °C (77 °F)
Output drift over temperature span	±100 ns/°C (55.6 ns/°F) from 0...60 °C (32...140 °F) @ 0.5 A	±10 ns/°C (5.56 ns/°F) from 0...60 °C (32...140 °F) @ 0.5 A
Field power loss detection <sup>(3)</sup>	Yes	

**Technical Specifications - 5069-0B16, 5069-0B16K, and 5069-0B16F**

Attribute	5069-0B16, 5069-0B16K	5069-0B16F
No load detection diagnostics	Yes (per channel diagnostics)	
Output short circuit/overload/overtemp detection	Yes (per channel diagnostics)	
Output short circuit/overload protection	Yes	
Reverse voltage protection	Yes	
Overvoltage protection, max	36V (fuse protected)	
Pilot duty rating	0.5 A pilot duty rating per channel @ 10...32V DC	
Output control in fault state per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>	
Output states in program mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>	
Output states in fault mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>	
Duration of fault mode per point	<ul style="list-style-type: none"> <li>• 1 s</li> <li>• 2 s</li> <li>• 5 s</li> <li>• 10 s</li> <li>• Forever (default)</li> </ul>	
Scheduled outputs	Not supported	±10 µs accuracy 1 ns resolution

(1) Local Actuator (LA) Field Power related attributes.

(2) Recommended Loading Resistor - To limit the effects of leakage current through solid-state outputs, you can connect a loading resistor in parallel with your load. For 24V DC operation, use a 5.6 KΩ, 0.5 W resistor for transistor operation.

(3) Supported only on Series B hardware.

**General Specifications - 5069-0B16, 5069-0B16K, and 5069-0B16F**

Attribute	5069-0B16, 5069-0B16K	5069-0B16F
Outputs	16 Channels (1 group of 16), sourcing	
Voltage category	12/24V DC source	
Voltage and current ratings		
MOD Power	75 mA @ 18...32V DC	
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC	
LA Power	0.5 A per channel @ 10...32V DC 8 A per module @ 10...32V DC	
SA Power Passthrough, max <sup>(2)</sup> The module does not draw SA Power current.	9.95 A @ 10...32V DC	
Do not exceed 10 A MOD or SA Power (Passthrough) current draw		
Power dissipation, max	3.25 W (16 channels @ 0.5 A)	
Thermal dissipation, max	11.09 BTU/hr	

**General Specifications - 5069-0B16, 5069-0B16K, and 5069-0B16F**

Attribute	5069-0B16, 5069-0B16K	5069-0B16F
Isolation voltage	250V (continuous), Basic Insulation Type No isolation between LA power and output ports No isolation between individual output ports	
Module keying	Electronic, module keying, software configurable	
Indicators	1 green/red module status indicator 16 yellow/red I/O status indicators	
Slot width	1	
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)	
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.	
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.	
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N•m (3.5 lb•in)	
RTB keying	None	
Wire category <sup>(3)</sup>	2 - output ports 2 - power ports 1 wire per terminal for each signal port	
Wire size		
5069-RTB18-SPRING removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation	
5069-RTB18-SCREW removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation	
Insulation stripping length		
5069-RTB18-SPRING connections	10 mm (0.39 in.)	
5069-RTB18-SCREW connections	12 mm (0.47 in.)	
Weight, approx	175 g (0.39 lb)	
Enclosure type	None (open - style)	
North American temp code	T4	
ATEX temp code	T4	
IECEX temp code	T4	

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).



**Environmental Specifications - 5069-OB16, 5069-OB16K, and 5069-OB16F**

<b>Attribute</b>	<b>5069-OB16, 5069-OB16K, 5069-OB16F</b>
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max.	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on output ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on output ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on MOD power port

**Certifications - 5069-0B16, 5069-0B16K, and 5069-0B16F**

<b>Certification<sup>(1)</sup></b>	<b>5069-0B16, 5069-0B16K, 5069-0B16F</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU, compliant with: <ul style="list-style-type: none"> <li>• EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>• EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-0; General Requirements</li> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• II 3 G Ex nA IIC T4 Gc</li> <li>• DEMKO 15 ATEX 1484X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>• IEC 60079-0; General Requirements</li> <li>• IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• II 3 G Ex nA IIC T4 Gc</li> <li>• IECEX UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-0W4I Digital 4-point Isolated Relay Output Module

The following figure shows a wiring diagram for the 5069-0W4I module.

### 5069-0W4I Wiring Diagram

#### Channel Connections

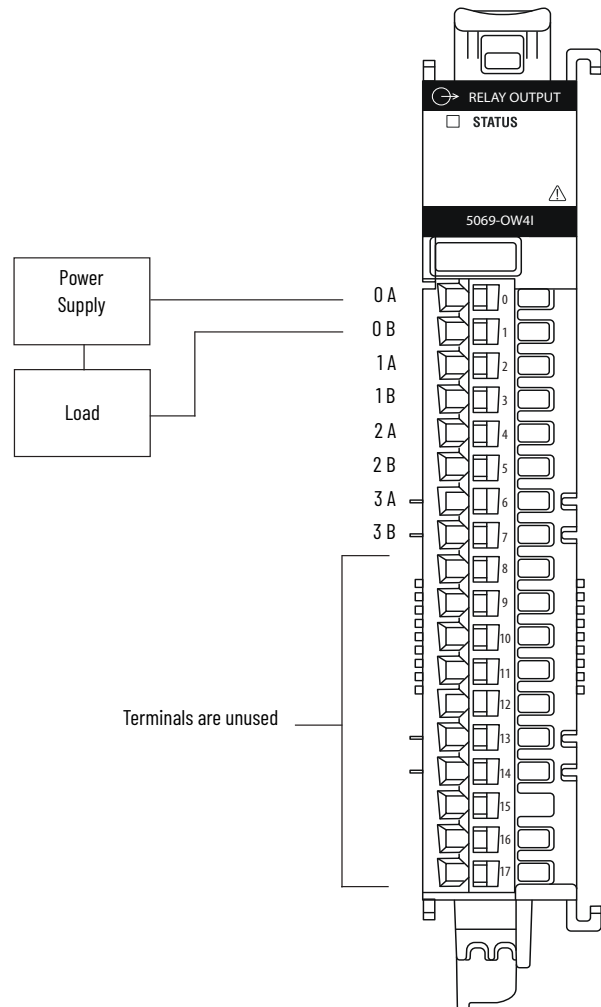
The diagram shows a device that is connected to channel 0. You are not restricted to using only this channel. You can connect devices to any channel or combination of channels as needed.

#### SA Power

The 5069-0W4I module **does not draw current from the SA power bus.**

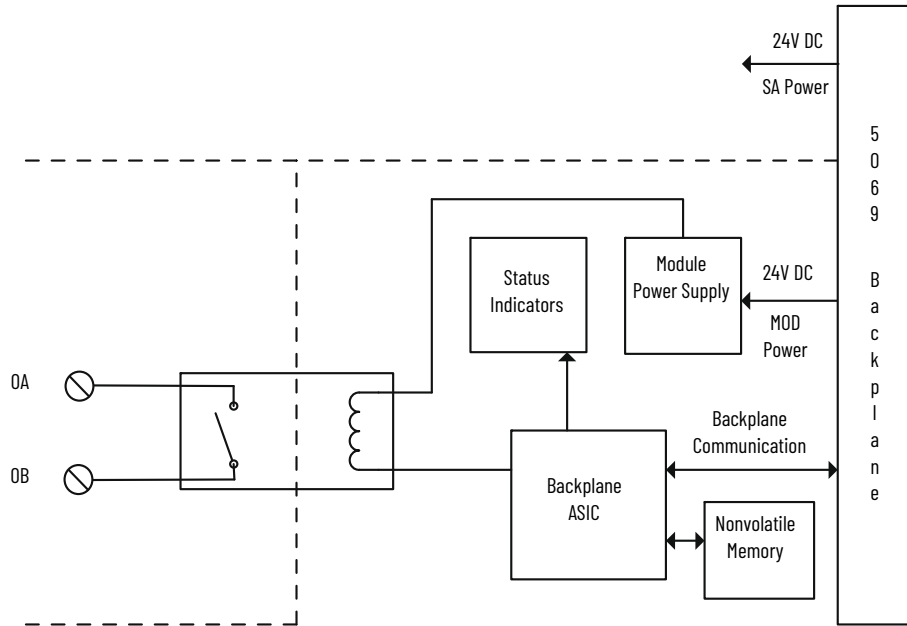
Still, the module is a DC-type module, and you must install it on a DC SA Power bus.

- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA Power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a functional block diagram for the 5069-0W4I module.

**5069-0W4I Functional Block Diagram**



**Technical Specifications - 5069-0W4I**

Attribute	5069-0W4I
Relay rating <sup>(1)</sup>	2 A resistive per channel @ 5...30V DC 2 A resistive per channel @ 5...264V AC, 50/60 Hz 2 A general use per channel @ 5...250V AC, 50/60 Hz 2 A @ 5...125V AC, ATEX/IECEX 8 A per module, max
Off-state leakage	0 mA (dry contact, no onboard snubbers)
Output current rating, max	2 A per channel 8 A per module
Output delay time, max	
Off to On	10 ms
On to Off	10 ms
Switching frequency	1 operation every 3 seconds (0.3 Hz at rated load)
Initial contact resistance, max	30 mΩ
Bounce time, mean	500 μs
Output control in fault state per point	<ul style="list-style-type: none"> <li>• Hold last state</li> <li>• On</li> <li>• Off (default)</li> </ul>
Output states in program mode per point	<ul style="list-style-type: none"> <li>• Hold last state</li> <li>• On</li> <li>• Off (default)</li> </ul>
Output states in fault mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>
Duration of fault mode per point	<ul style="list-style-type: none"> <li>• 1 s</li> <li>• 2 s</li> <li>• 5 s</li> <li>• 10 s</li> <li>• Forever (default)</li> </ul>
Delay to fault	Supported

**Technical Specifications - 5069-0W4I**

Attribute	5069-0W4I
Fusing	Outputs are not fused.
Minimum load current	1 mA
Expected contact life	300K cycles resistive, 100K cycles inductive
Pilot duty rating	5...240V AC, 50/60 Hz, C300 pilot duty per channel 5...125V DC, R150 pilot duty per channel

(1) **Surge Suppression** - Connecting surge suppressors across your external inductive load extends the life of the module. For additional details, see the Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley® publication [1770-4.1](#).

**Relay Contact Ratings - 5069-0W4I**

Volts, max	Continuous Amps per Point, max	Amperes		Voltamperes		NEMA ICS 2-125
		Make	Break	Make	Break	
240V AC	2 A	7.5 A	0.75 A	1800VA	180VA	C300
125V DC	0.27 A <sup>(1)</sup>	0.22 A <sup>(2)</sup>		28VA		R150
24V DC	2.0 A	1.16 A <sup>(2)</sup>		28VA		-

(1) Calculated based on the Rockwell Automation® component derating guideline: 90% of rated contact current, that is, 0.3 A at 125V DC.

(2) For DC voltage applications, the make/break ampere rating for relay contacts is determined by dividing 28VA by the applied DC voltage. For example, 28VA/48V DC = 0.58 A.

**General Specifications - 5069-0W4I**

Attribute	5069-0W4I
Outputs	4 - Form A (normally open)
Voltage and current ratings	
Output voltage range	5...125V DC 5...264V AC
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup> The module does not draw SA Power current.	9.95 A @ 0...32V DC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw	
Power dissipation, max	2.3 W
Thermal dissipation, max	7.85 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type
Module keying	Electronic keying via programming software
Slot width	1
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N•m (3.5 lb•in)
RTB keying	None
Indicators	1 green/red module status indicator 4 yellow/red I/O status indicators

**General Specifications - 5069-0W4I**

Attribute	5069-0W4I
Wire category <sup>(3)</sup>	1 - relay ports 2 - power ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SPRING removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation Use minimum 18 AWG, 105 °C (221 °F) rated wire for load connections to relay output modules.
5069-RTB18-SCREW removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation Use minimum 18 AWG, 105 °C (221 °F) rated wire for load connections to relay output modules.
Insulation stripping length	
5069-RTB18-SPRING connections	10 mm (0.39 in.)
5069-RTB18-SCREW connections	12 mm (0.47 in.)
Weight, approx	175 g (0.39 lb)
Enclosure type	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

- (1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-0W4I**

Attribute	5069-0W4I
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

**Environmental Specifications - 5069-0W4I**

Attribute	5069-0W4I
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±4 kV @ 5 kHz on relay ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on relay ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on MOD Power port

**Certifications - 5069-0W4I**

Certification <sup>(1)</sup>	5069-0W4I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA nC IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul> When used at or below 125V DC or 30V DC
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA nC IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul> When used at or below 125V DC or 30V DC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-0W16 Digital 16-point Relay Output Module

The following figure shows a wiring diagram for the 5069-0W16 module.

### 5069-0W16 Wiring Diagram

The 5069-0W16 module **requires SA power** to function. The module is a DC-type module, so you must install it on an SA power bus that uses DC-type power.

You can connect AC-type devices, DC-type devices, or, as shown below, a combination of the two types to the module. Because the module has two commons, each shared across a set of eight output channels, make sure that you do not connect devices of different power types to the same set of commons. For example, you cannot connect a device that uses AC-type power to output channel 0 and a device that uses DC-type power to output channel 1.

#### Channel Connections

The example shows devices connected to channels 0, 2, 4, 6, 8, 10, 12, and 14. You are not restricted to using only those channels.

You can connect devices to any channel or combination of channels as needed.

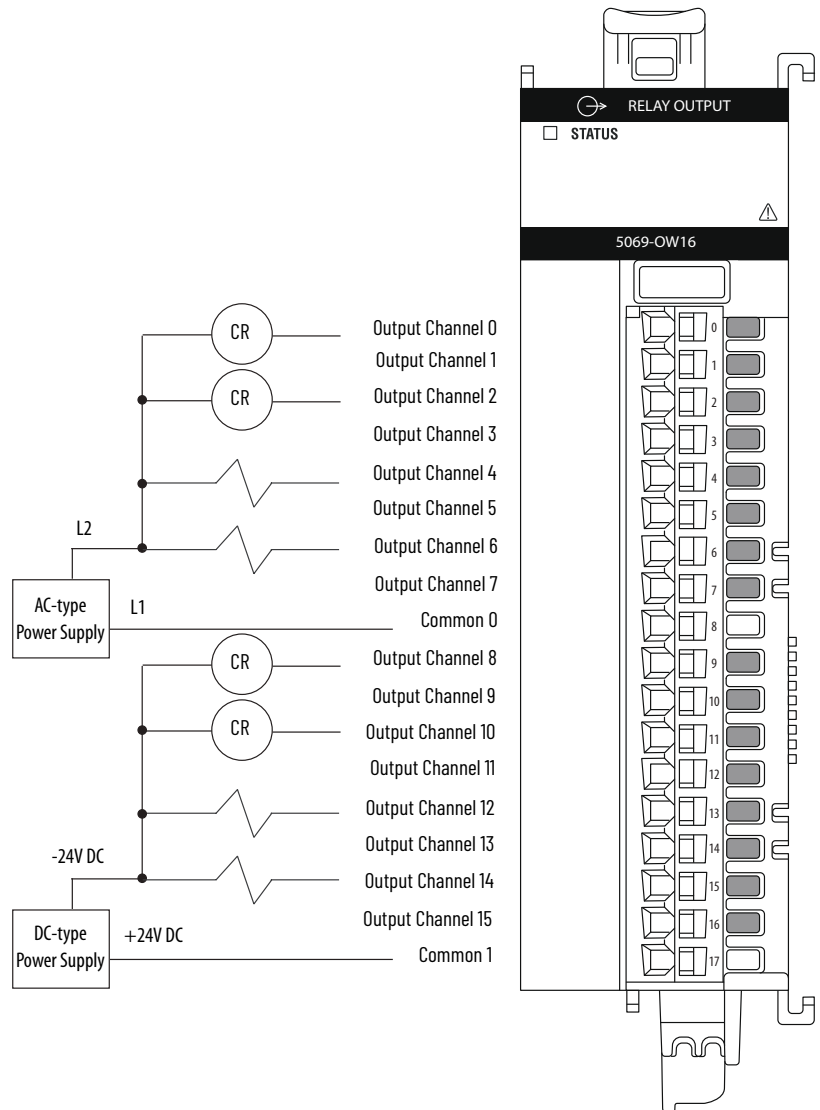
#### SA Power

Connections to an external power supply that provides SA power are made via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- Compact GuardLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

**IMPORTANT:** Remember the following:

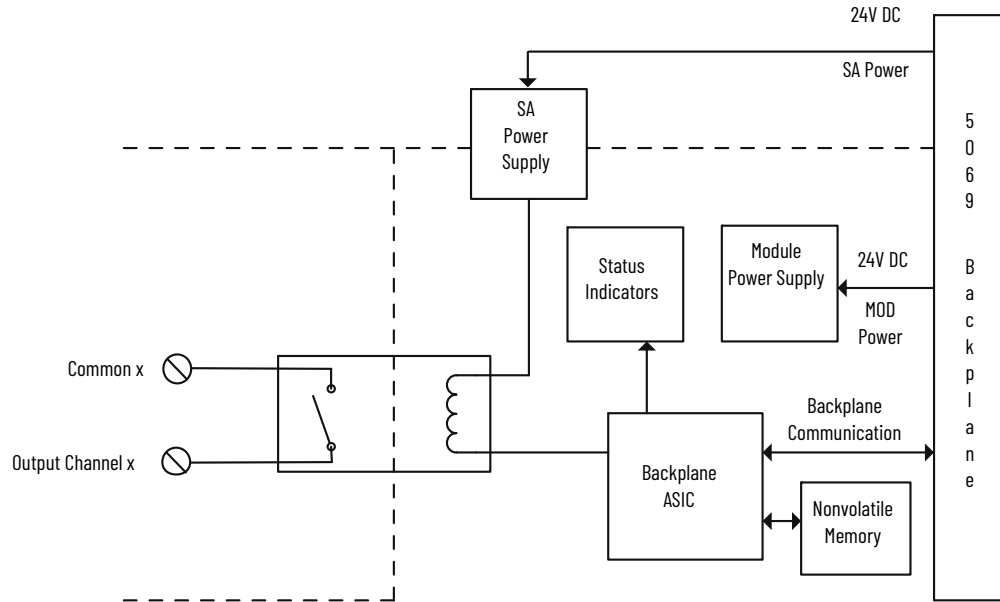
- The 5069-0W16 module requires DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the module.
- If you install modules in a system that uses AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.





The following figure shows a functional block diagram for the 5069-0W16 module.

### 5069-0W16 Functional Block Diagram



### Technical Specifications - 5069-0W16

Attribute	5069-0W16
Relay ratings <sup>(1)</sup>	2 A resistive per channel @ 5...30V DC 2 A resistive per channel @ 5...264V AC, 50/60 Hz 2 A general use per channel @ 5...250V AC, 50/60 Hz 2 A @ 5...125V AC, ATEX/IECEX
Off-state leakage current per point, max	0 mA (dry contact, no onboard snubbers)
Output current per group, max	8 A
Output current per module, max	16 A
Output delay time, max	
Off to On	10 ms
On to Off	10 ms
Switching frequency	1 operation every 3 seconds (0.3 Hz at rated load)
Initial contact resistance, max	30 mΩ
Bounce time, mean	500 μs
Delay to fault	Supported
Fusing	Outputs are not fused
Minimum load current	1 mA
Expected contact life	300K cycles resistive, 100K cycles inductive
Pilot duty rating	5...240V AC, 50/60 Hz, C300 pilot duty per channel 5...125V DC, R150 pilot duty per channel
Output control in fault state per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>

**Technical Specifications - 5069-0W16**

Attribute	5069-0W16
Output states in program mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>
Output states in fault mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>
Duration of fault mode per point	<ul style="list-style-type: none"> <li>• 1</li> <li>• 2</li> <li>• 5</li> <li>• 10 s</li> <li>• Forever (default)</li> </ul>

(1) **Surge Suppression** - Connecting surge suppressors across your external inductive load extends the life of the module. For additional details, see the Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley® publication [1770-4.1](#).

**Relay Contact Ratings - 5069-0W16**

Volts, max	Continuous Amps per Point, max	Amperes		Voltamperes		NEMA ICS 2-125
		Make	Break	Make	Break	
240V AC	2 A	7.5 A	0.75 A	1800VA	180VA	C300
125V DC	0.27 A <sup>(1)</sup>	0.22 A <sup>(2)</sup>		28VA		R150
24V DC	2.0 A	1.16 A <sup>(2)</sup>		28VA		-

(1) Calculated based on the Rockwell Automation component derating guideline: 90% of rated contact current, that is, 0.3 A at 125V DC.

(2) For DC voltage applications, the make/break ampere rating for relay contacts is determined by dividing 28VA by the applied DC voltage. For example, 28VA/48V DC = 0.58 A.

**General Specifications - 5069-0W16**

Attribute	5069-0W16
Outputs	16 (Two groups of 8) - Form A (normally open)
Voltage and current ratings	
Output voltage range	5...125V DC 5...264V AC
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power	150 mA @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 18...32V DC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw. The 5069-0W16 module complies with ATEX/IECEx when used at or below 125V AC or 30V DC.	
Power dissipation, max	3.0 W
Thermal dissipation, max	10.2 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type Type tested at 1800V AC for 60 s No isolation between individual channels
Module keying	Electronic keying via programming software
Indicators	1 green/red module status indicator 16 yellow/red I/O status indicators
Slot width	1.5
Dimensions (HxWxD), approx	144.57 x 36 x 105.42 mm (5.69 x 1.42 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.

**General Specifications - 5069-0W16**

Attribute	5069-0W16
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N-m (3.5 lb-in)
RTB keying	None
Wire category <sup>(3)</sup>	1 - relay ports 2 - power ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SPRING connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation, single wire connection only. Use minimum 18 AWG, 105 °C (221 °F) rated wire for load connections to relay output modules.
5069-RTB18-SCREW connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation, single wire connection only. Use minimum 18 AWG, 105 °C (221 °F) rated wire for load connections to relay output modules.
Insulation stripping length	
5069-RTB18-SPRING connections	10 mm (0.39 in.)
5069-RTB18-SCREW connections	12 mm (0.47 in.)
Weight, approx	240 g (0.53 lb.)
Enclosure type rating	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-0W16**

Attribute	5069-0W16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g

**Environmental Specifications - 5069-0W16**

<b>Attribute</b>	<b>5069-0W16</b>
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on relay ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on relay ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Corrosion resistance classification	ISA S71.04 G2

**Certifications - 5069-0W16**

<b>Certification<sup>(1)</sup></b>	<b>5069-0W16</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> <li>EN 61000-6-4; Industrial Emissions</li> </ul>
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA nC IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul> When used at or below 125V DC or 30V DC
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA nC IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul> When used at or below 125V DC or 30V DC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-0X4I Digital 4-point Isolated Normally-open/Normally-closed Output Module

The following figure shows a wiring diagram for the 5069-0X4I module.

### 5069-0X4I Wiring Diagram

#### Channel Connections

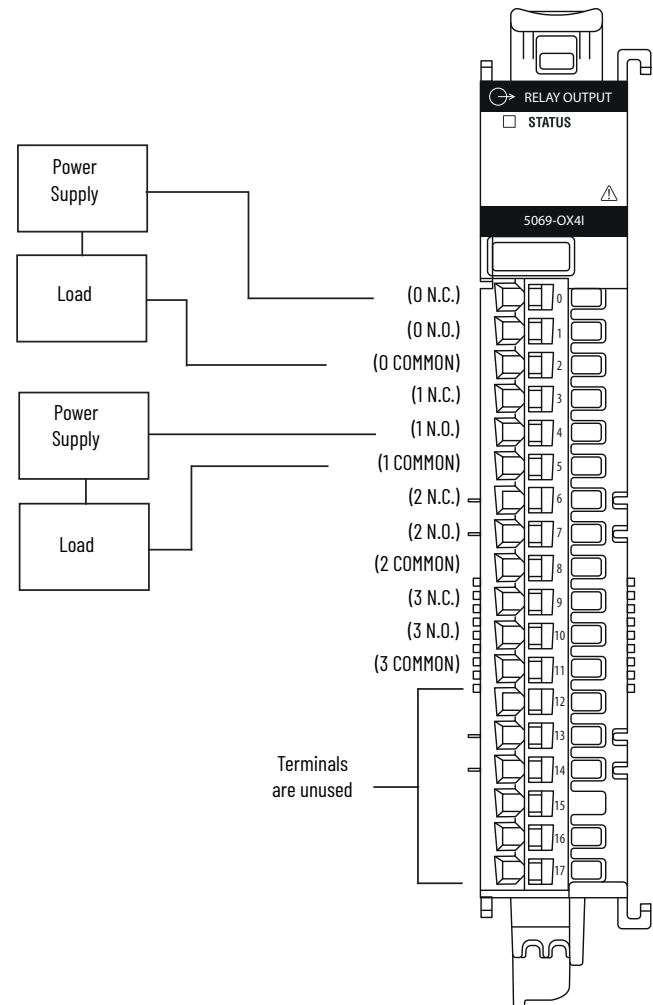
The diagram shows devices that are connected to channels 0 and 1. You are not restricted to using only those channels. You can connect devices to any channel or combination of channels as needed.

#### SA Power

The 5069-0X4I module **does not draw current from the SA power bus**.

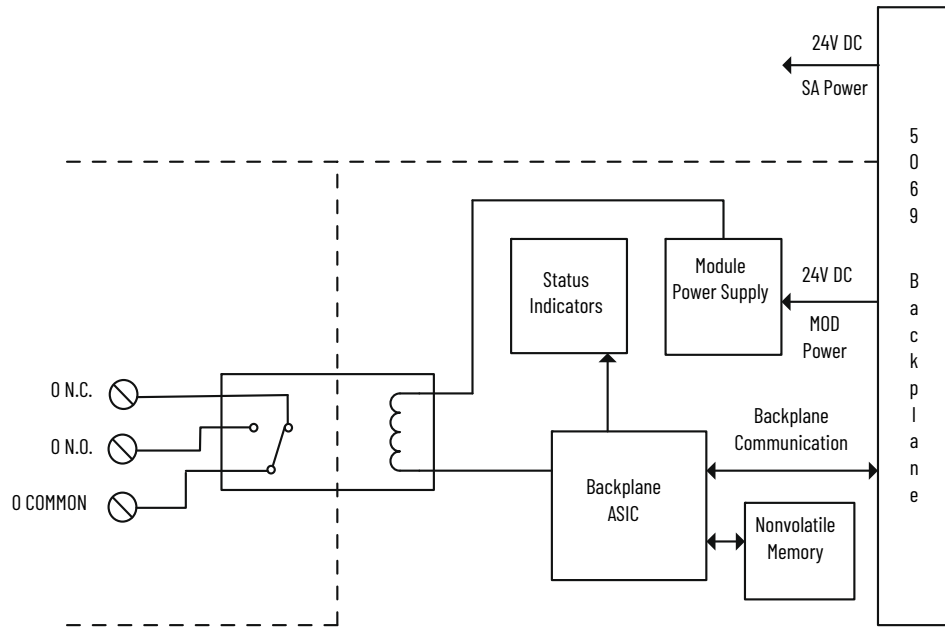
Still, the module is a DC-type module, and you must install it on a DC SA Power bus.

- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA Power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a functional block diagram for the 5069-0X4I module.

### 5069-0X4I Functional Block Diagram



### Technical Specifications - 5069-0X4I

Attribute	5069-0X4I
Contact current rating <sup>(1)</sup>	2 A resistive per channel @ 5...30V DC 2 A resistive per channel @ 5...264V AC, 50/60 Hz 2 A general use per channel @ 5...250V AC, 50/60 Hz 2 A @ 5...125V AC, ATEX/IECEX 8 A per module, max
Off-state leakage	0 mA (dry contact, no onboard snubbers)
Output current rating	2 A per channel 8 A per module, max
Output delay time, max	
Off to On	15 ms
On to Off	15 ms
Switching frequency	1 operation every 3 seconds (.3 Hz at rated load)
Initial contact resistance, max	30 mΩ
Bounce time, mean	500 μs
Output control in fault state per point	<ul style="list-style-type: none"> <li>• Hold last state</li> <li>• On</li> <li>• Off (default)</li> </ul>
Output states in program mode per point	<ul style="list-style-type: none"> <li>• Hold last state</li> <li>• On</li> <li>• Off (default)</li> </ul>
Output states in fault mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>

**Technical Specifications - 5069-0X4I**

Attribute	5069-0X4I
Duration of fault mode per point	<ul style="list-style-type: none"> <li>• 1 s</li> <li>• 2 s</li> <li>• 5 s</li> <li>• 10 s</li> <li>• Forever (default)</li> </ul>
Delay to fault	Supported
Fusing	Outputs are not fused.
Minimum load current	10 mA
Expected contact life	300K cycles resistive, 100K cycles inductive
Pilot duty rating	5...240V AC, 50/60 Hz, C300 pilot duty per channel 5...125V DC, R150 pilot duty per channel

(1) **Surge Suppression** - Connecting surge suppressors across your external inductive load extends the life of the module. For additional details, see the Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication [1770-4.1](#).

**Relay Contact Ratings - 5069-0X4I**

Volts, max	Continuous Amps per Point, max	Amperes		Voltamperes		NEMA ICS 2-125
		Make	Break	Make	Break	
240V AC	2 A	7.5 A	0.75 A	1800VA	180VA	C300
125V DC	0.225 A <sup>(1)</sup>	0.22 A <sup>(2)</sup>		28VA		R150
24V DC	2.0 A	1.16 A <sup>(2)</sup>		28VA		-

(1) Calculated based on the Rockwell Automation component derating guideline: 90% of rated contact current, that is, 0.25 A at 125V DC.

(2) For DC voltage applications, the make/break ampere rating for relay contacts is determined by dividing 28VA by the applied DC voltage. For example, 28VA/48V DC = 0.58 A.

**General Specifications - 5069-0X4I**

Attribute	5069-0X4I
Outputs	4 - Form C (SPDT)
Voltage and current ratings	
Output voltage range	5...125V DC 5...264V AC
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup> The module does not draw SA Power current.	9.95 A @ 0...32V DC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw	
Power dissipation, max	2.6 W
Thermal dissipation, max	8.88 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type
Module keying	Electronic keying via programming software
Slot width	1
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.

**General Specifications - 5069-0X4I**

Attribute	5069-0X4I
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N•m (3.5 lb•in)
RTB keying	None
Indicators	1 green/red module status indicator 4 yellow/red I/O status indicators
Wire category <sup>(3)</sup>	1 - relay ports 2 - power ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SPRING removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation Use minimum 18 AWG, 105 °C (221 °F) rated wire for load connections to relay output modules.
5069-RTB18-SCREW removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation Use minimum 18 AWG, 105 °C (221 °F) rated wire for load connections to relay output modules.
Insulation stripping length	
5069-RTB18-SPRING connections	10 mm (0.39 in.)
5069-RTB18-SCREW connections	12 mm (0.47 in.)
Weight, approx	175 g (0.39 lb)
Enclosure type	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-0X4I**

Attribute	5069-0X4I
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)



**Environmental Specifications - 5069-0X4I**

Attribute	5069-0X4I
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat):	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±4 kV @ 5 kHz on relay ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on relay ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on MOD Power port

**Certifications - 5069-0X4I**

Certification <sup>(1)</sup>	5069-0X4I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA nC IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul> When used at or below 125V DC or 30V DC
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA nC IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul> When used at or below 125V DC or 30V DC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## Analog I/O Modules

I/O Type	Cat. No.	Description	Page
Analog input	5069-IF8	8-channel current/voltage input module	50
	5069-IY4	4-channel current/voltage/RTD/Thermocouple input module	58
	5069-IY4K	4-channel conformal coated current/voltage/RTD/Thermocouple input module	
Analog output	5069-OF4	4-channel current/voltage output module	73
	5069-OF4K	4-channel conformal coated current/voltage output module	
	5069-OF8	8-channel current/voltage output module	

### 5069-IF8 Analog 8-channel Current/Voltage Input Module

The following table lists the devices that are supported with the 5069-IF8 module.

Device	Mode(s) <sup>(1)</sup>	Supported	Wiring Diagram Example
2-wire analog device 4-wire analog device <sup>(2)</sup>	Current	Yes	<a href="#">page 51</a>
	Voltage		<a href="#">page 52</a>
	Combination of current and voltage	Yes	<a href="#">page 53</a>
1-wire analog device 3-wire analog device 2-wire Thermocouple device 2-wire RTD device 3-wire RTD device	N/A - These devices are not supported regardless of the channel mode configuration.	No	—

(1) Make sure that the channel configuration in your Logix Designer application project matches the input device type that is connected to the channel. You choose the input type in the Channels category on the Module Properties dialog box. For example, if a current input device is connected to channel 0 on the module, the module configuration for channel must be Input Type = Current.

(2) These devices are 2-wire current and voltage devices with 2-wire sensor power connections.

The following figure shows a wiring diagram for the 5069-IF8 module with channels configured for current mode.

## 5069-IF8 Wiring Diagram - Current Mode

### Channel Connections

The diagram shows devices that are connected to channels 0, 2, 5, and 7. You are not restricted to using only this channel. You can connect devices to any channel or combination of channels as needed.

#### IMPORTANT: Remember the following:

- Place additional loop devices, for example, strip chart recorders, at either **A** location in the current loop.
- Use separate external power supplies to provide SA power to the system and to power external devices that are connected to the module.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal.
- If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip. In this case, use the same power supply to power the additional devices. If separate power supplies are used to power the additional devices, ground the power supplies at the same ground location.

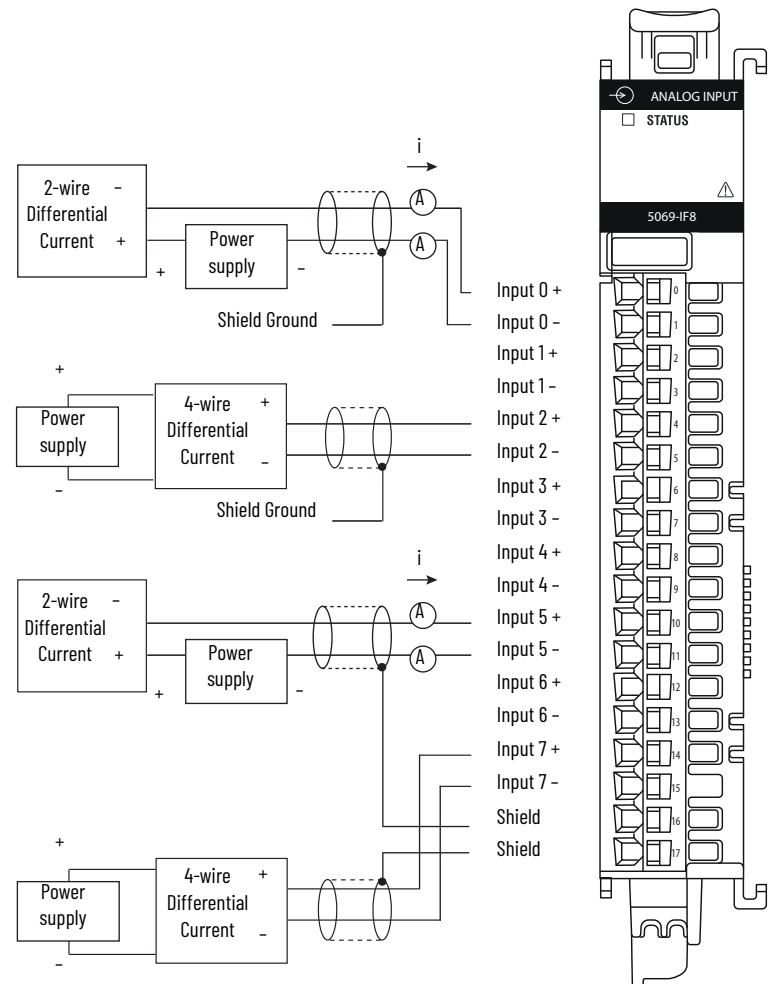
### SA Power

Connections to an external power supply that provides SA power are made via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- Compact GuardLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

#### IMPORTANT: Remember the following:

- The 5069-IF8 module uses DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  - Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  - Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  - Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a wiring diagram for the 5069-IF8 module with channels configured for voltage mode.

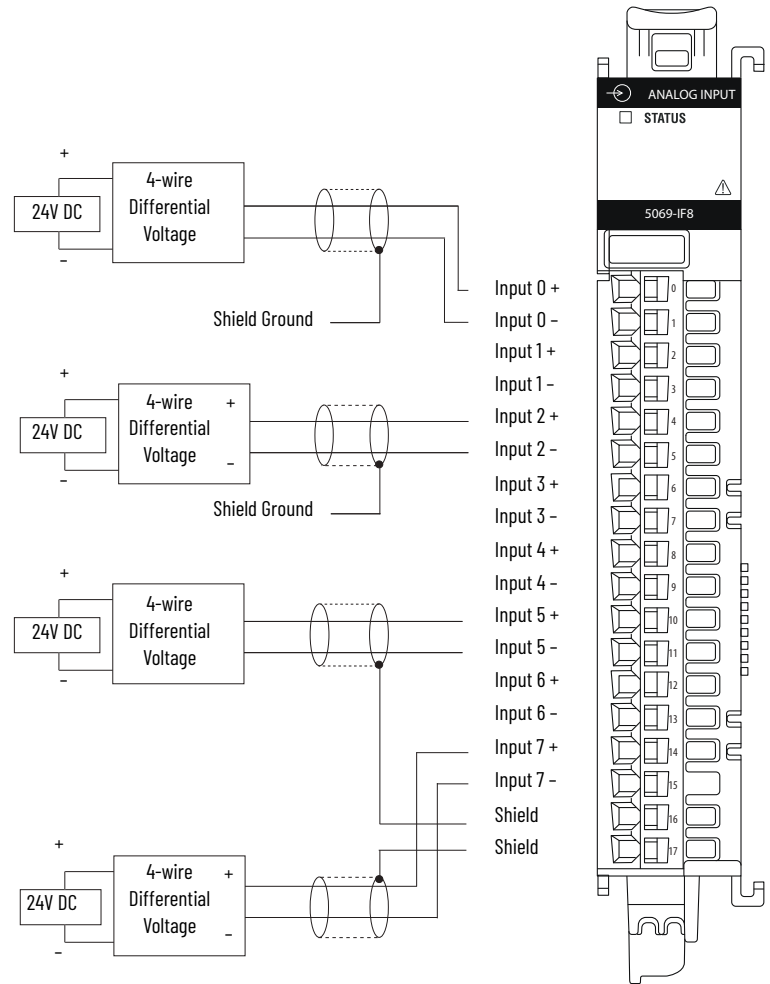
### 5069-IF8 Wiring Diagram - Voltage Mode

#### Channel Connections

The diagram shows devices that are connected to channels 0, 2, 5, and 7. You are not restricted to using only this channel. You can connect devices to any channel or combination of channels as needed.

**IMPORTANT:** Remember the following:

- Use separate external power supplies to provide SA power to the system and to power external devices that are connected to the module.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal. If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip. In this case, use the same power supply to power the additional devices. If separate power supplies are used to power the additional devices, ground the power supplies at the same ground location.



The following figure shows a wiring diagram for the 5069-IF8 module with different device types connected to different channels. The device type and mode configuration for each channel must match.

## 5069-IF8 Wiring Diagram - Combination of Device Types Connected to the Module

### Channel Connections

The diagram shows devices that are connected to channels 0, 2, 5, and 7. You are not restricted to using only this channel. You can connect devices to any channel or combination of channels as needed.

#### IMPORTANT: Remember the following:

- Place additional loop devices, for example, strip chart recorders, at either **A** location in the current loop.
- Use separate external power supplies to provide SA power to the system and to power external devices that are connected to the module.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal. If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip. In this case, use the same power supply to power the additional devices. If separate power supplies are used to power the additional devices, ground the power supplies at the same ground location.

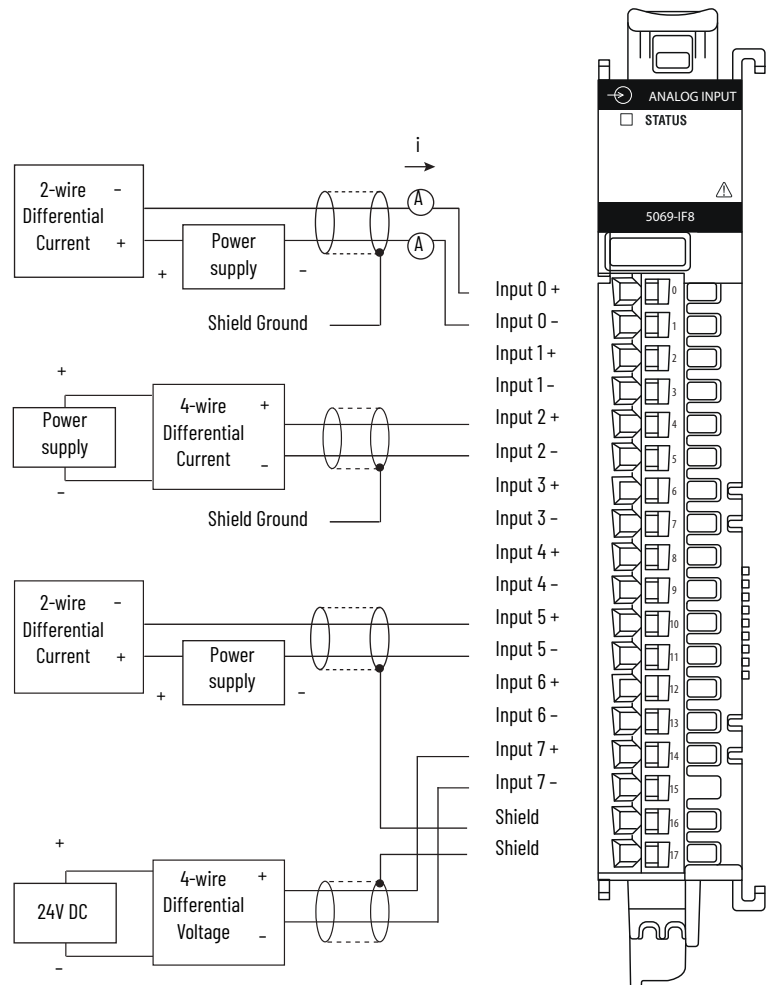
### SA Power

Connections to an external power supply that provides SA power are made via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- Compact GuardLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

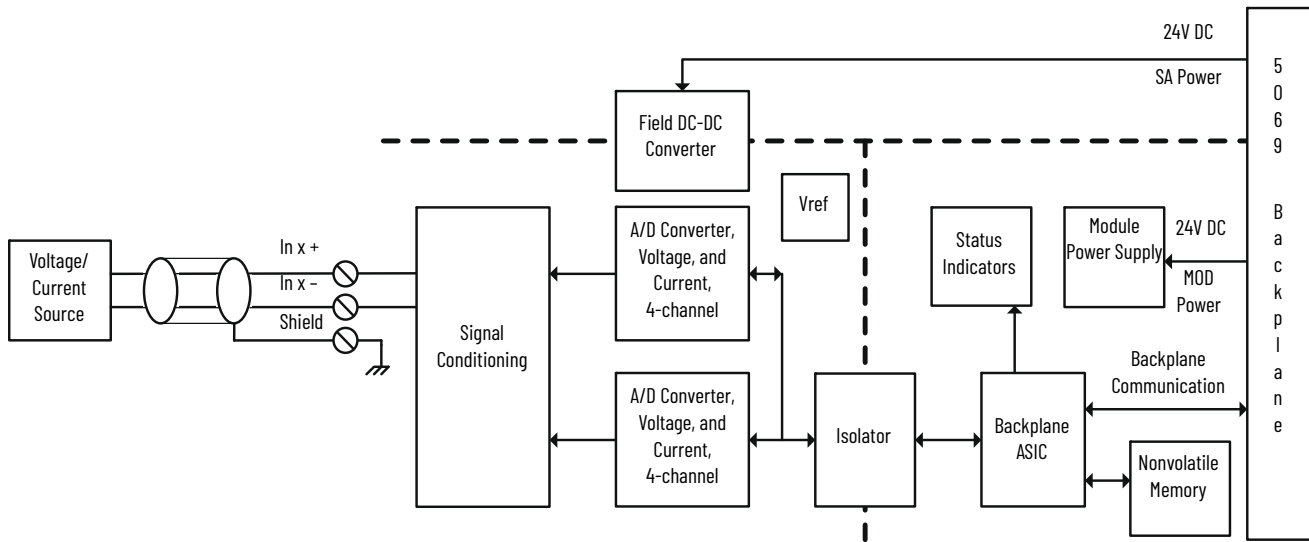
#### IMPORTANT: Remember the following:

- The 5069-IF8 module uses DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  - Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  - Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  - Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a functional block diagram for the 5069-IF8 module.

**5069-IF8 Functional Block Diagram**



**Technical Specifications - 5069-IF8**

Attribute	5069-IF8
Inputs	8 differential
Input range, voltage	±10V 0...10V 0...5V
Input range, current	0...20 mA 4...20 mA
Input impedance	Voltage: >1 MΩ Current: 90 Ω typical, 70...110 Ω range
Common mode voltage (channel to channel)	±10V (Current mode) ±2V (Voltage mode)
Module conversion method	Sigma-Delta, Two 24-bit multiplexed ADC
Resolution, voltage <sup>(1)</sup> (16 bits at 10 Hz notch filter)	±10.5V: <320 μV/count (15 bits plus sign bipolar) 0...10.5V: <160 μV/count (16 bits unipolar) 0...5.25V: <80 μV/count (16 bits unipolar)
Resolution, current <sup>(1)</sup> (16 bits at 10 Hz notch filter)	0...21 mA: <0.32 μA/count (16 bits) 3.6...21 mA: <0.27 μA/count (16 bits)
Calibrated accuracy at 25 °C	Voltage 0.10% full scale Current 0.10% full scale
Accuracy drift with temperature	Voltage 0.20% full scale Current 0.30% full scale
Input Total Unadjusted Error (TUE) <sup>(2)</sup> (Over full temperature range)	Voltage 0.30% full scale Current 0.40% full scale
Scan Time Per channel Per group (channel group 0...3 or channel group 4...7)	625 μs 2.5 ms
Notch filter at minimum RPI (0.2 ms, 1 channel enabled)	62.5 kHz

**Technical Specifications - 5069-IF8**

Attribute	5069-IF8
Minimum notch filter frequency at RPI of 2.5 ms	10 kHz
Step response time to 63% of value (Notch filter 10 kHz)	7.5 ms
Input notch filter (Hz) selections	5, 10 (50/60 Default), 15, 20, 50, 60, 100, 200, 500, 1000, 2500, 5000, 10000, 15625, 25000, 31250, 62500
Input anti-aliasing filter cutoff frequency, nom	500 Hz
Input digital filter	First order lag, 0 ms (Default)...32,767 ms (32.767 s)
HART handheld compliance	Add an external 250 $\Omega$ resistor into the current loop for HART transmitter compliance.
Overvoltage protection, max	Voltage and Current modes: $\pm 30V$ DC
Overcurrent protection, max	Current mode: $\pm 30$ mA
Data value during overload condition	Full scale, overrange flag, Data uncertain / data bad
Open circuit detection time	Voltage: + full scale, < 2 s Current: 4...20 mA range, < 2 s
Onboard data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	IEEE 32-bit floating point

(1) Notch filter dependent.

(2) Includes offset, gain, non-linearity, and repeatability error terms.

**General Specifications - 5069-IF8**

Attribute	5069-IF8
Voltage and current ratings	
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power	100 mA @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 18...32V DC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw.	
Power dissipation, max	Voltage mode: 2.1 W Current mode: 2.4 W
Thermal dissipation, max	Voltage mode: 7.2 BTU/hr Current mode: 8.2 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type 50V Functional Isolation between SA power and input ports No isolation between individual Input ports
Calibration methods	Factory calibrated User-performed (optional)
Module keying	Electronic keying via programming software
Indicators	1 green/red module status indicator 8 yellow/red I/O status indicator
Slot width	1
Common mode noise rejection ratio	130 dB @ 50/60 Hz
Normal mode noise rejection ratio	65 dB @ 50/60 Hz, notch filter dependent
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)

**General Specifications - 5069-IF8**

Attribute	5069-IF8
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>5069-RTB18-SPRING RTB</li> <li>5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N•m (3.5 lb•in)
RTB keying	None
Wire category <sup>(3)</sup>	2 - shielded input ports 2 - power ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SPRING removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation
5069-RTB18-SCREW removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation
Insulation stripping length	
5069-RTB18-SPRING connections	10 mm (0.39 in.)
5069-RTB18-SCREW connections	12 mm (0.47 in.)
Weight, approx	175 g (0.39 lb)
Enclosure type	None (open-style)
North American temperature code	T4
ATEX temp code	T4
IECEX temp code	T4

- (1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-IF8**

Attribute	5069-IF8
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g



**Environmental Specifications - 5069-IF8**

Attribute	5069-IF8
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 880% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on shielded input ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±2 kV line-earth (CM) on shielded input ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on MOD Power port

**Certifications - 5069-IF8**

Certification <sup>(1)</sup>	5069-IF8
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-IY4 and 5069-IY4K Analog Input Modules

The following table lists the analog devices that are supported with the 5069-IY4 and 5069-IY4K modules.

Device	Mode(s) <sup>(1)</sup>	Supported	Wiring Diagram Example
1-wire analog device 2-wire analog device 4-wire analog device <sup>(2)</sup>	Current	Yes	<a href="#">page 59</a> and <a href="#">page 60</a>
	Voltage		
	Any combination of current, voltage, RTD, Thermocouple <sup>(3)</sup>	Yes	<a href="#">page 64</a> and <a href="#">page 65</a>
2-wire RTD device 3-wire RTD device	RTD	Yes	<a href="#">page 61</a> and <a href="#">page 62</a>
	Any combination of current, voltage, RTD, Thermocouple <sup>(3)</sup>	Yes	<a href="#">page 64</a> and <a href="#">page 65</a>
2-wire Thermocouple device	Thermocouple <sup>(4)</sup>	Yes	<a href="#">page 63</a>
	Any combination of current, voltage, RTD, Thermocouple <sup>(3)</sup>	Yes	<a href="#">page 64</a> and <a href="#">page 65</a>

- (1) Make sure that the channel configuration in your Logix Designer application project matches the input device type that is connected to the channel. You choose the input type in the Channels category on the Module Properties dialog box. For example, if a current input device is connected to channel 0 on the module, the module configuration for channel must be Input Type = Current.
- (2) These devices are 2-wire current and voltage devices with 2-wire sensor power connections.
- (3) You must use the 5069-RTB14CJC RTB if at least one thermocouple is connected to the module. If there are no thermocouples connected to the module, we recommend that you use the 5069-RTB18 RTB.
- (4) You must use the 5069-RTB14CJC RTB.

The following figure shows a wiring diagram for a 5069-IY4 module with channels configured for current mode and voltage mode with single-ended inputs.

### 5069-IY4 and 5069-IY4K Wiring Diagram – Current Mode and Voltage Mode With Single-ended Inputs

#### Channel Connections

The diagram shows devices that are connected to channels 0, 1, and 2. You are not restricted to using only this channel. You can connect devices to any channel or combination of channels as needed.

#### IMPORTANT: Remember the following:

- Use separate external power supplies to provide SA power to the system and to power external devices that are connected to the module.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal. If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip. In this case, use the same power supply to power the additional devices. If separate power supplies are used to power the additional devices, ground the power supplies at the same ground location.

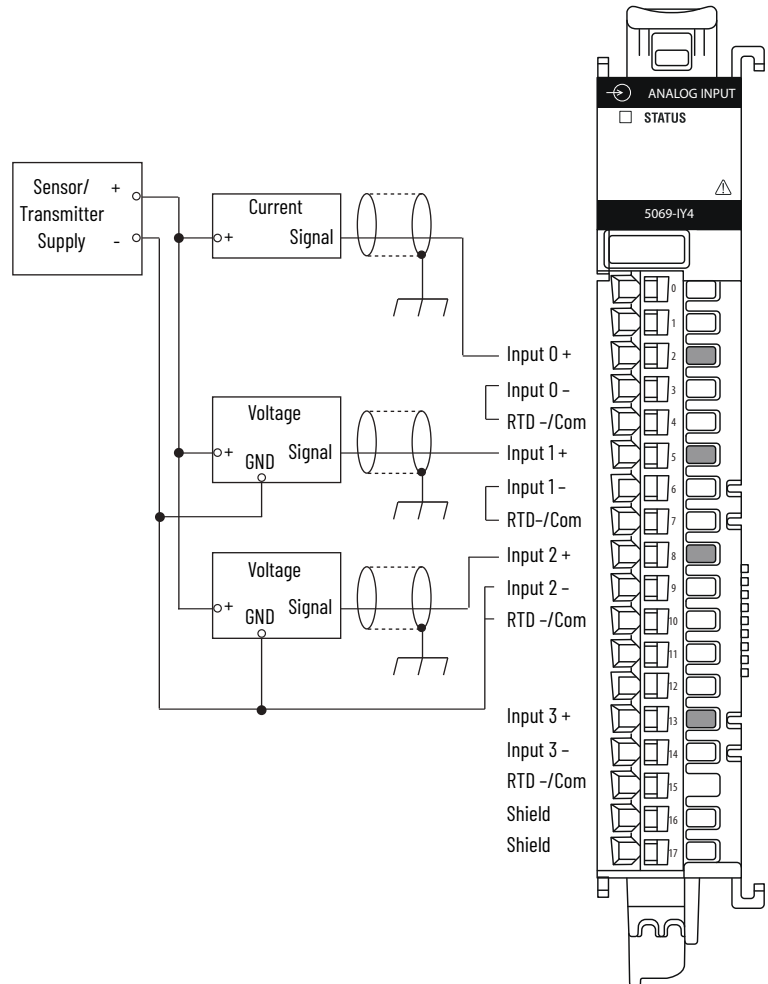
#### SA Power

Connections to an external power supply that provides SA power are made via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- Compact GuardLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

#### IMPORTANT: Remember the following:

- The 5069-IF8 module uses DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a wiring diagram for a 5069-IY4 module with channels configured for current mode and voltage mode with mixed transmitter inputs.

### 5069-IY4 and 5069-IY4K Wiring Diagram – Current Mode and Voltage Mode With Mixed Transmitter Inputs

#### Channel Connections

The diagram shows devices that are connected to channels 0, 1, 2, and 3. You are not required to use all of the channels.

You can connect devices to any channel or combination of channels as needed.

#### IMPORTANT: Remember the following:

- Use separate external power supplies to provide SA power to the system and to power external devices that are connected to the module.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal. If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip. In this case, use the same power supply to power the additional devices. If separate power supplies are used to power the additional devices, ground the power supplies at the same ground location.

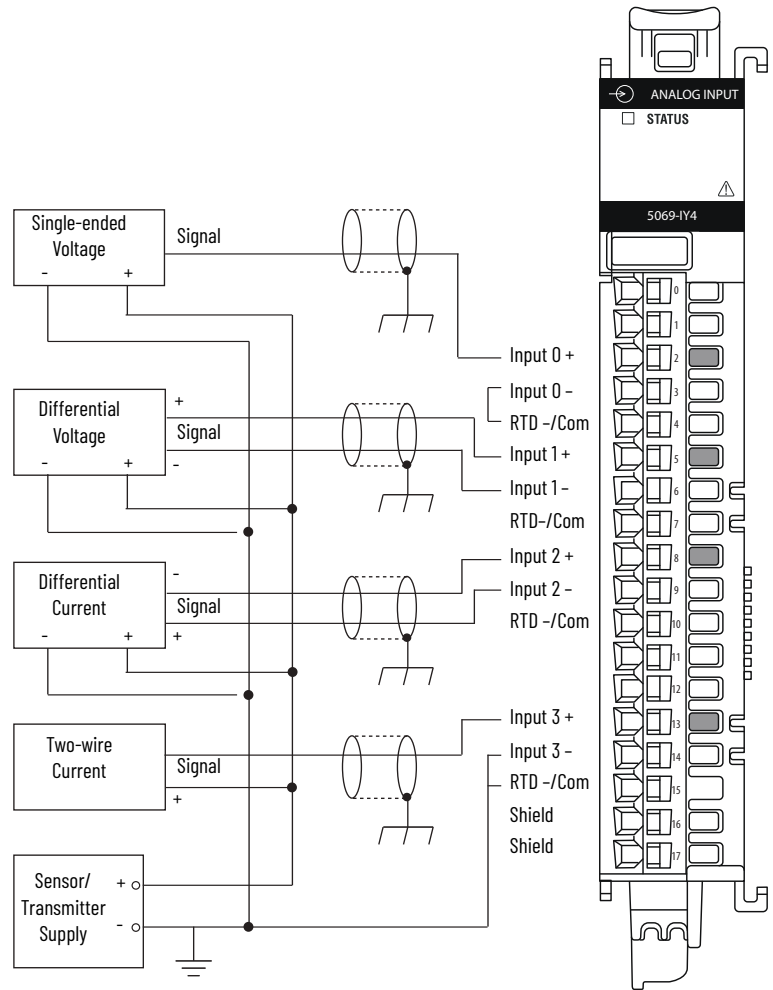
#### SA Power

Connections to an external power supply that provides SA power are made via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- Compact GuardLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

#### IMPORTANT: Remember the following:

- The 5069-IF8 module uses DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a wiring diagram for a 5069-IY4 module with channels configured for RTD mode.

### 5069-IY4 and 5069-IY4K Wiring Diagram - 3-wire RTD

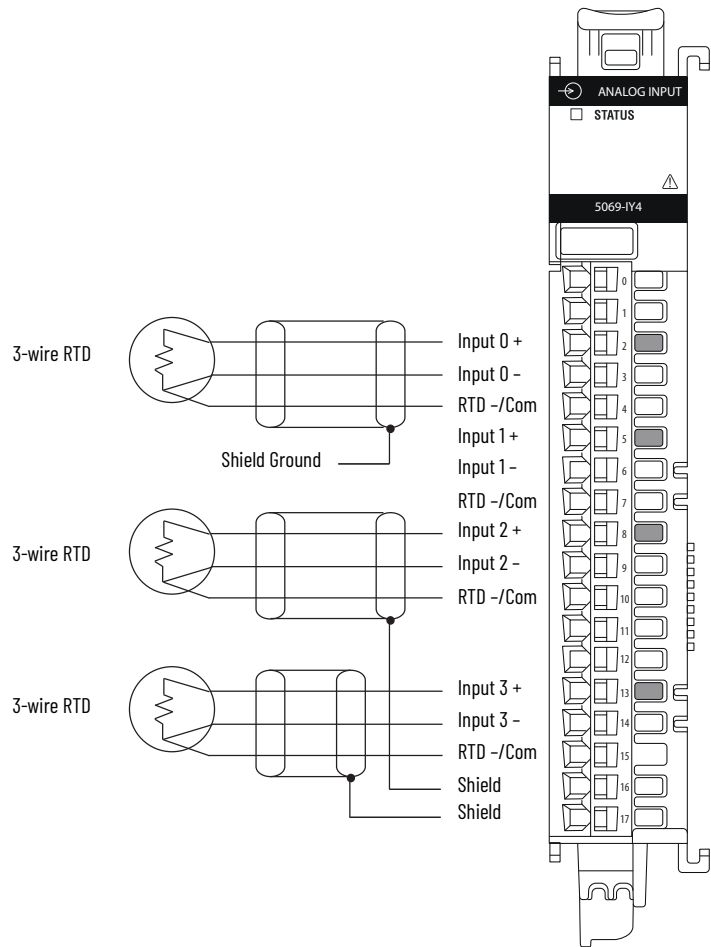
#### Channel Connections

The diagram shows devices that are connected to channels 0, 2, and 3. You are not restricted to using only this channel.

You can connect devices to any channel or combination of channels as needed.

**IMPORTANT** - This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal.

If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip.



The following figure shows a wiring diagram for a 5069-IY4 module with channels configured for RTD mode.

### 5069-IY4 and 5069-IY4K Wiring Diagram - 2-wire RTD

#### Channel Connections

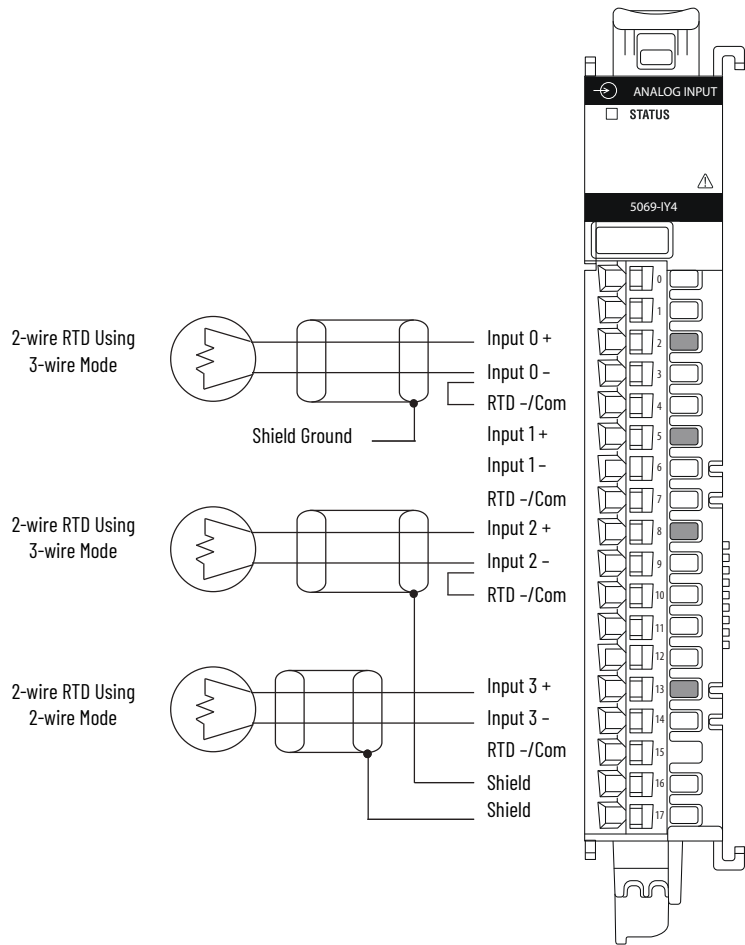
The diagram shows a device that is connected to channels 0, 2, and 3. You are not restricted to using only these channels.

You can connect devices to any channel or combination of channels as needed.

**IMPORTANT:** Remember the following:

- When you use a 2-wire RTD in 3-wire mode, as shown on the RTDs that are connected to channel 3, you must jumper terminals Input x- and RTD x together.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal.

If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip.



The following figure shows a wiring diagram for a 5069-IY4 module with channels configured for thermocouple mode.

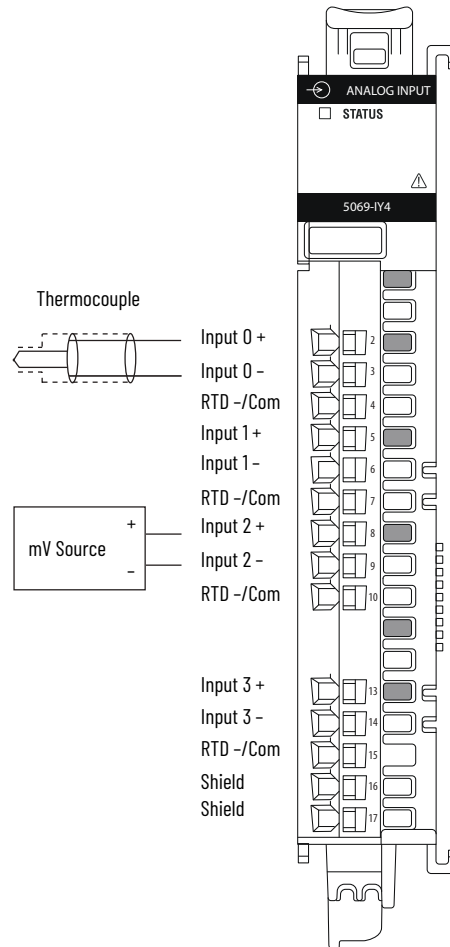
### 5069-IY4 and 5069-IY4K Wiring Diagram - Thermocouple Input

#### Channel Connections

The diagram shows a device that is connected to channel 0 and channel 2. You are not restricted to using only these channels. You can connect devices to any channel or combination of channels as needed.

**IMPORTANT:** When you use the 5069-IY4 and 5069-IY4K analog input modules in Thermocouple mode, you must use one of these CJC type RTBs:

- 5069-RTB14CJC-SPRING (shown)
- 5069-RTB14CJC-SCREW



The following figure shows a wiring diagram for the 5069-IY4 module with different device types connected to different channels.

## 5069-IY4 and 5069-IY4K Wiring Diagram - Current, Voltage and RTD Device Types Connected to the Module

### Channel Connections

The diagram shows an analog current device connected to channel 0, an analog voltage device connected to channel 1, and an RTD connected to channel 2. You are not restricted to using those devices with those channels.

You can connect devices to any channel or combination of channels as needed.

### IMPORTANT: Remember the following:

- In this example, the module can use a 5069-RTB18 RTB because no thermocouple devices are connected to the module.
- Use separate external power supplies to provide SA power to the system and to power external devices that are connected to the module.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal. If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip. In this case, use the same power supply to power the additional devices. If separate power supplies are used to power the additional devices, ground the power supplies at the same ground location.

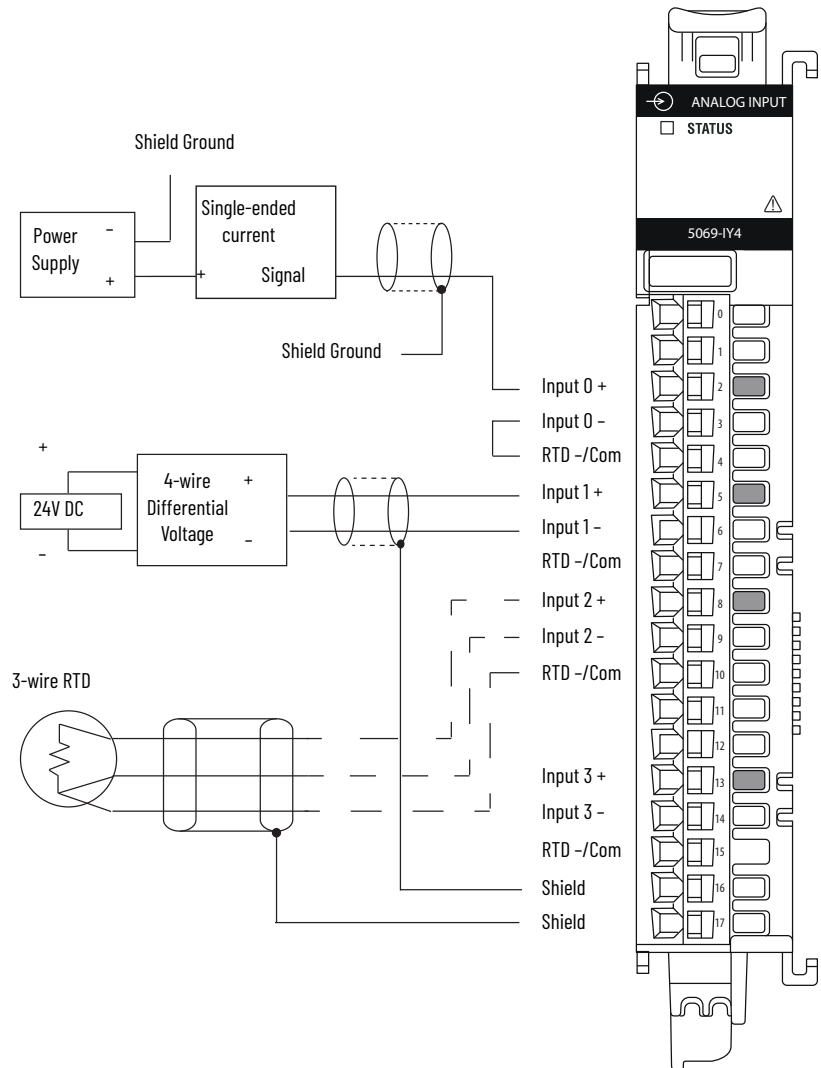
### SA Power

Connections to an external power supply that provides SA power are made via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- CompactLogix 5480 controller
- Compact GuardLogix 5380 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

### IMPORTANT: Remember the following:

- The 5069-IY4 and 5069-IY4K modules use DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  - Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  - Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  - Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.





The following figure shows a wiring diagram for 5069-a IY4 module with channels configured for current, voltage, RTD, and thermocouple modes.

## 5069-IY4 and 5069-IY4K Wiring Diagram – Current, Voltage, RTD, and Thermocouple Modes

### Channel Connections

The diagram shows specific devices connected to channels 0, 1, 2, and 3, respectively. You are not restricted to using those devices with those channels.

You can connect devices to any channel or combination of channels as needed.

**IMPORTANT:** Remember the following:

- When an analog current device is connected to the module, place additional loop devices, for example, strip chart recorders, at either **A** location in the current loop.
- Use separate external power supplies to provide SA power to the system and to power external devices that are connected to the module.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal.
- If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip. In this case, use the same power supply to power the additional devices. If separate power supplies are used to power the additional devices, ground the power supplies at the same ground location.

### SA Power

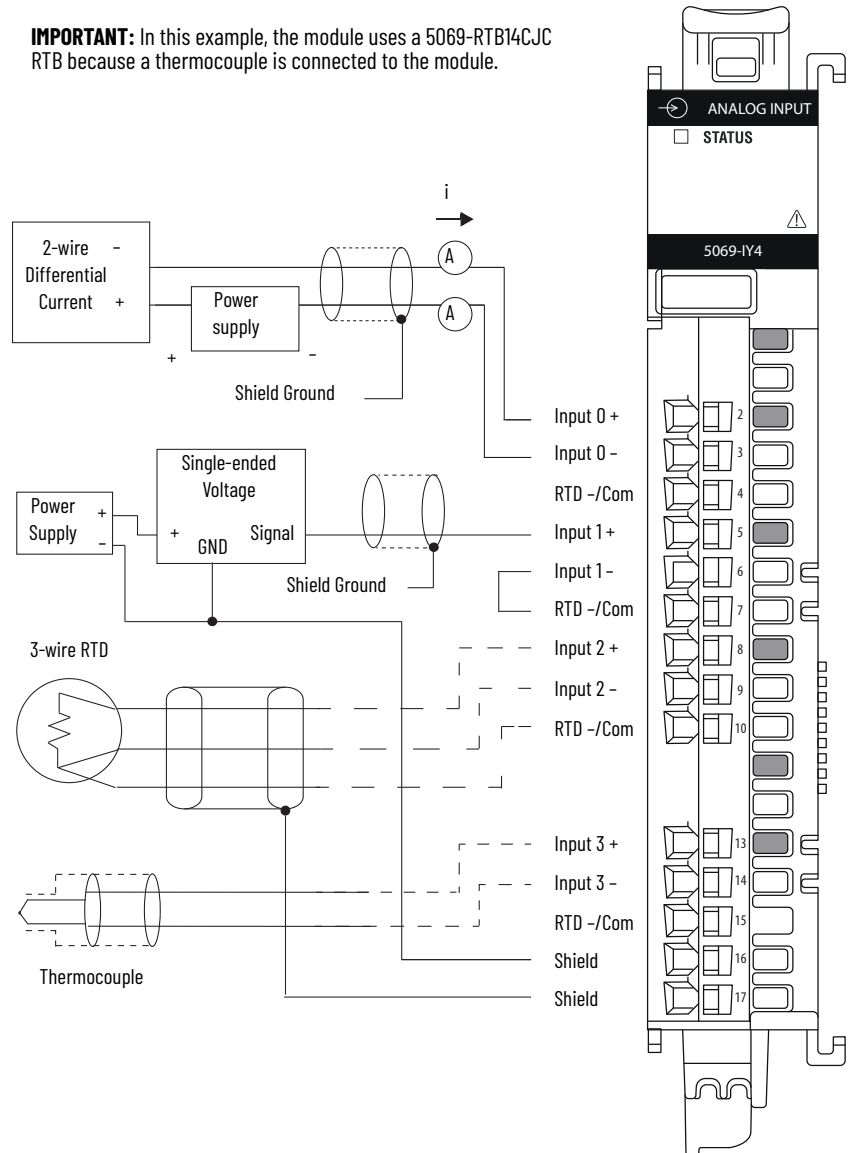
Connections to an external power supply that provides SA power are made via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- CompactLogix 5480 controller
- Compact GuardLogix 5380 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

**IMPORTANT:** Remember the following:

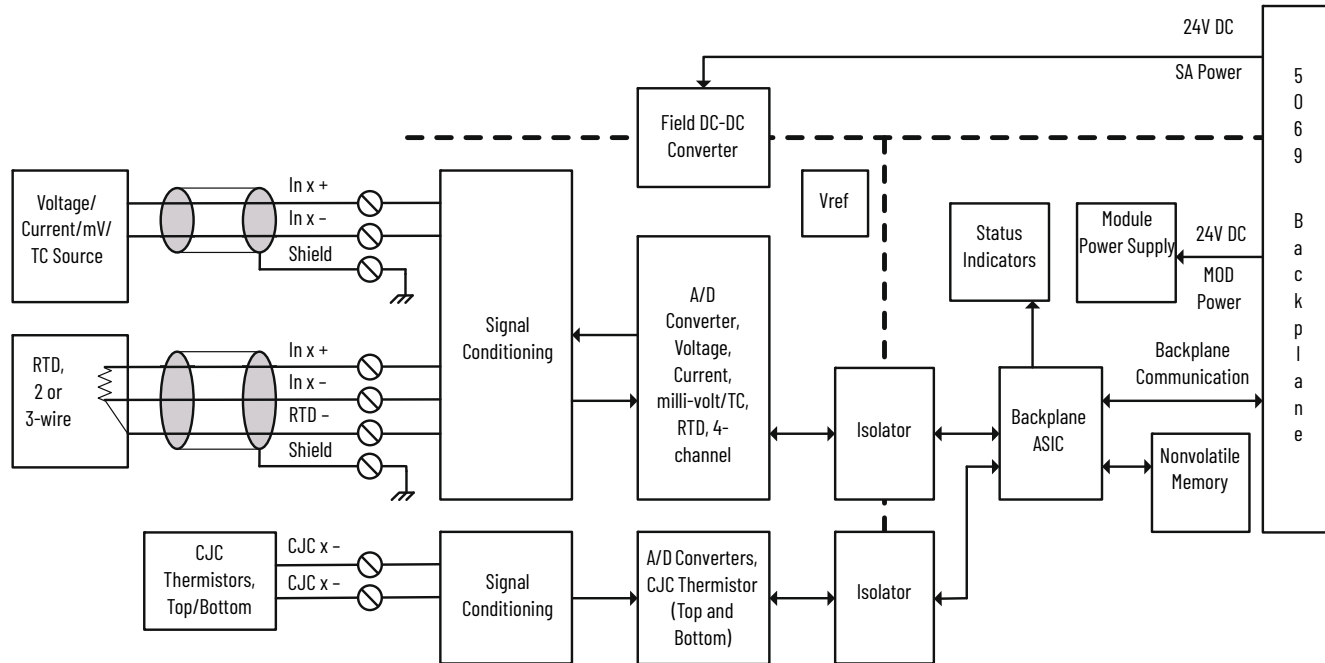
- The 5069-IY4 and 5069-IY4K modules use DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  - Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  - Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  - Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.

**IMPORTANT:** In this example, the module uses a 5069-RTB14CJC RTB because a thermocouple is connected to the module.



The following figure shows a functional block diagram for the 5069-IY4 and 5069-IY4K modules.

### 5069-IY4 and 5069-IY4K Functional Block Diagram



### Technical Specifications - 5069-IY4 and 5069-IY4K

Attribute	5069-IY4, 5069-IY4K
Inputs	4 differential
Input range, voltage	$\pm 10V$ 0...10V 0...5V
Input range, current	0...20 mA 4...20 mA
Input range, resistive	1...500 $\Omega$ 2...1000 $\Omega$ 4...2000 $\Omega$ 8...4000 $\Omega$
Input type, RTD	100, 200, 500, 1000 $\Omega$ platinum, $\alpha=385$ 100, 200, 500, 1000 $\Omega$ platinum, $\alpha=3916$ 120 $\Omega$ nickel, $\alpha=672$ 100, 120, 200, 500 $\Omega$ nickel, $\alpha=618$ 10 $\Omega$ copper 427
Input range, thermocouple / millivolt	$\pm 100$ mV
Input type, thermocouple	B, C, D, E, J, K, L (TXK/XK), N, R, S, T
Input impedance	Voltage: $>1$ M $\Omega$ Current: 90 $\Omega$ typical, 70...110 $\Omega$ range RTD: $>1$ M $\Omega$ Thermocouple/millivolt: $>1$ M $\Omega$
Common mode voltage (channel to channel)	$\pm 10V$ (Current mode and 3-wire RTD mode) $\pm 2V$ (Voltage mode)

## Technical Specifications - 5069-IY4 and 5069-IY4K

Attribute	5069-IY4, 5069-IY4K
Module conversion method	Sigma-Delta, One 24-bit multiplexed ADC
Resolution, voltage <sup>(1)</sup> (16 bits at 10 Hz notch filter)	±10.5V: <320 µV/count (15 bits plus sign bipolar) 0...10.5V: <160 µV/count (16 bits unipolar) 0...5.25V: <80 µV/count (16 bits unipolar)
Resolution, current <sup>(1)</sup> (16 bits at 10 Hz notch filter)	0...21 mA: <0.32 µA/count (16 bits) 3.6...21 mA: <0.27 µA/count (16 bits)
Resolution, RTD <sup>(1)</sup> (16 bits at 10 Hz notch filter) 3 Wire mode	< 7.9 mΩ/cnt in 1...500 Ω mode < 15.8 mΩ/cnt in 2...1000 Ω mode < 31.7 mΩ/cnt in 4...2000 Ω mode < 63.4 mΩ/cnt in 8...4000 Ω mode
Resolution, thermocouple / millivolt <sup>(1)</sup> (16 bits at 10 Hz notch filter)	< 3.1 µV/cnt in ±100 mV mode
RTD excitation current	600 µA, 3 wire mode 100 µA, 2 wire mode
Wire impedance (3-wire RTD mode only)	25 Ω maximum for specified accuracy
RTD sensor types/temperature range: (Each sensor type in a cell supports all temperature ranges in the corresponding column to the right.)	
100, 200, 500, 1000 Ohm PT 385	-200...+870 °C -328...+1598 °F 73...1143 °K 132...2058 °R
100, 200, 500, 1000 Ohm PT 3916	-200...+630 °C -328...+1166 °F 73...903 °K 132...1626 °R
10 Ohm CU 247	-200...+260 °C -328...+500 °F 73...533 °K 132...960 °R
120 Ohm NI 672	-80...+320 °C -112...+608 °F 193...593 °K 348...1068 °R
100, 120, 200, 500 Ohm NI 618	-60...+250 °C -76...+482 °F 213...523 °K 384...942 °R

**Technical Specifications - 5069-IY4 and 5069-IY4K**

Attribute	5069-IY4, 5069-IY4K
Thermocouple type/temperature range	
Thermocouple Type B	21...1820 °C 68...3308 °F 293...2093 °K 528...3768 °R
Thermocouple Type C	0...2320 °C 32...4208 °F 273...2593 °K 492...4668 °R
Thermocouple Type D	0...2320 °C 32...4208 °F 273...2593 °K 492...4668 °R
Thermocouple Type E	-270...+1000 °C -454...+1832 °F 3...1273 °K 6...2292 °R
Thermocouple Type J	-210...+1200 °C -346...+2192 °F 63...1473 °K 114...2652 °R
Thermocouple Type K	-270...+1372 °C -454...+2502 °F 3...1645 °K 6...2961 °R
Thermocouple Type N	-270...+1300 °C -454...+2372 °F 3...1573 °K 6...2832 °R
Thermocouple Type R	-50...+1768 °C -58...+3215 °F 223...2041 °K 402...3674 °R
Thermocouple Type S	-50...+1768 °C -58...+3215 °F 223...2041 °K 402...3674 °R
Thermocouple Type T	-270...+400 °C -454...+752 °F 3...673 °K 6...1212 °R
Thermocouple Type TXK/XK (L)	-200...+800 °C -328...+1472 °F 73...1073 °K 132...1932 °R
Thermocouple linearization	ITS-90

## Technical Specifications - 5069-IY4 and 5069-IY4K

Attribute	5069-IY4, 5069-IY4K
CJC inputs (for thermocouple mode use only)	Two CJC sensors 2 thermistors embedded in 5069-RTB14CJC-(SCREW or SPRING) RTB -or- 2 thermistors wired to 5069-RTB18-(SCREW or SPRING) RTB Thermistor type: Measurement Specialties, Inc. 10K3A1A
Local CJC sensor accuracy	± 0.3 °C
Remote CJC sensor accuracy (Based on specified thermistor)	± 0.3 °C
Calibrated accuracy at 25 °C	Voltage 0.100% full scale Current 0.100% full scale RTD 0.100% full scale Thermocouple/millivolt 0.100% full scale
Accuracy drift with temperature	Voltage 0.200% full scale Current 0.300% full scale RTD 0.200% full scale Thermocouple/millivolt 0.200% full scale
Input Total Unadjusted Error (TUE) <sup>(2)</sup> (Over full temperature range)	Voltage 0.300% Full Scale Current 0.400% Full Scale RTD 0.300% Full Scale Thermocouple/millivolt 0.300% Full Scale
Scan time • Per channel • Per group (channel group 0...3)	625 µs 2.5 ms
Notch filter at minimum RPI (0.2 ms, 1 channel enabled)	62.5 kHz
Minimum notch filter frequency at RPI of 2.5 ms	10 kHz
Step response time to 63% of value (Notch filter 10 kHz)	7.5 ms
Input notch filter (Hz) selections	5, 10 (50/60 default), 15, 20, 50, 60, 100, 200, 500, 1000, 2500, 5000, 10000, 15625, 25000, 31250, 62500
Input anti-aliasing filter cutoff frequency, typical	500 Hz
Input digital filter	First Order Lag, 0 ms (Default)...32,767 ms (32.767 s)
HART handheld compliance:	Add an external 250 Ω resistor into the current loop for HART transmitter compliance.
Overvoltage protection, max	Voltage, current, RTD, and thermocouple/mV modes: ± 30V DC
Overcurrent protection, max	Current mode: ± 30 mA
Data value during overload condition	Full scale, overrange flag, Data uncertain / data bad
Open circuit detection time, nom	Voltage: + full scale, < 2 s Current: 4...20 mA range, < 2 s RTD: < 2 s Thermocouple / millivolt: + full scale, < 10 s
Onboard data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	IEEE 32-bit floating point

(1) Notch filter dependent.

(2) Includes offset, gain, non-linearity, and repeatability error terms.

## General Specifications - 5069-IY4 and 5069-IY4K

Attribute	5069-IY4, 5069-IY4K
Voltage and current ratings	
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power	100 mA @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 18...32V DC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw	
Power dissipation, max	Voltage mode: 1.8 W Current mode: 2.1 W RTD mode: 2.1 W Thermocouple / millivolt mode: 1.8 W
Thermal dissipation, max	Voltage mode: 6.1 BTU/hr Current mode: 7.2 BTU/hr RTD mode: 7.2 BTU/hr Thermocouple/millivolt: 6.1 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type 50V Functional Isolation between SA Power and input ports No isolation between individual input ports
Calibration methods	Factory calibrated User-performed (optional)
Module keying	Electronic keying via programming software
Indicators	1 green/red module status indicator 4 yellow/red I/O status indicators 2 yellow/red CJC status indicators
Slot width	1
Common mode noise rejection ratio	130 dB @ 50/60 Hz
Normal mode noise rejection ratio	65 dB @ 50/60 Hz, notch filter dependent
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SCREW</li> <li>• 5069-RTB18-SPRING</li> <li>• 5069-RTB14CJC-SCREW (Thermocouple mode)</li> <li>• 5069-RTB14CJC-SPRING (Thermocouple mode)</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.

**General Specifications - 5069-IY4 and 5069-IY4K**

Attribute	5069-IY4, 5069-IY4K
RTB torque (5069-RTB18-SCREW, 5069-RTB14CJC-SCREW)	0.4 N•m (3.5 lb•in)
RTB keying	None
Wire category <sup>(3)</sup>	2 - shielded input ports 2 - power ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SPRING and 5069-RTB14CJC-SPRING connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation, single wire connection only.
5069-RTB18-SCREW and 5069-RTB14CJC-SCREW connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation, single wire connection only.
Insulation stripping length	
5069-RTB18-SPRING connections	10 mm (0.39 in.)
5069-RTB18-SCREW connections	12 mm (0.47 in.)
Enclosure type	None (open-style)
Weight, approx	175 g (0.39 lb)
North American temperature code	T4
ATEX temp code	T4
IECEx temp code	T4

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-IY4 and 5069-IY4K**

Attribute	5069-IY4, 5069-IY4K
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz

**Environmental Specifications - 5069-IY4 and 5069-IY4K**

<b>Attribute</b>	<b>5069-IY4, 5069-IY4K</b>
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on shielded input ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±2 kV line-earth (CM) on shielded input ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on MOD Power port

**Certifications - 5069-IY4 and 5069-IY4K**

<b>Certification<sup>(1)</sup></b>	<b>5069-IY4, 5069-IY4K</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1484X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.



## 5069-OF4, 5069-OF4K, and 5069-OF8 Analog Current/Voltage Output Modules

The following figure shows a wiring diagram for the 5069-OF4 and 5069-OF4K modules when used in current mode.

### 5069-OF4 and 5069-OF4K Wiring Diagram - Current Mode

#### Channel Connections

The diagram shows a device that is connected to channels 0, 2, and 3. You are not restricted to using only these channels. You can connect devices to any channel or combination of channels as needed.

#### IMPORTANT: Remember the following:

- Place more loop devices, for example, strip chart recorders, at either **A** location in the current loop.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal.
- If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip

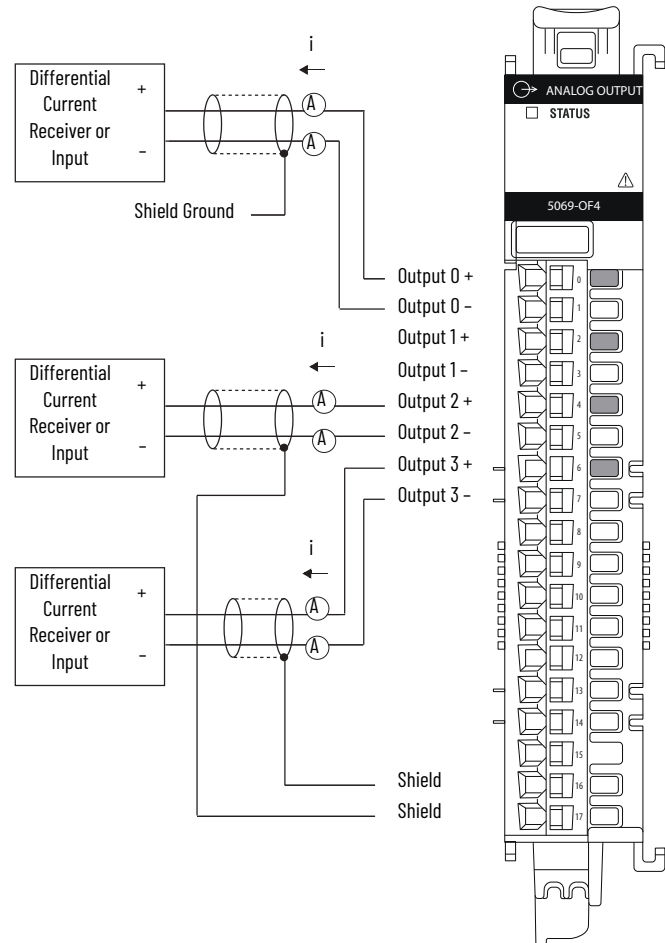
#### SA Power

Connections to an external power supply that provides SA power are made via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- Compact GuardLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

#### IMPORTANT: Remember the following:

- The 5069-OF4 module uses DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  - Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  - Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  - Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.



The following figure shows a wiring diagram for the 5069-OF8 module when used in current mode.

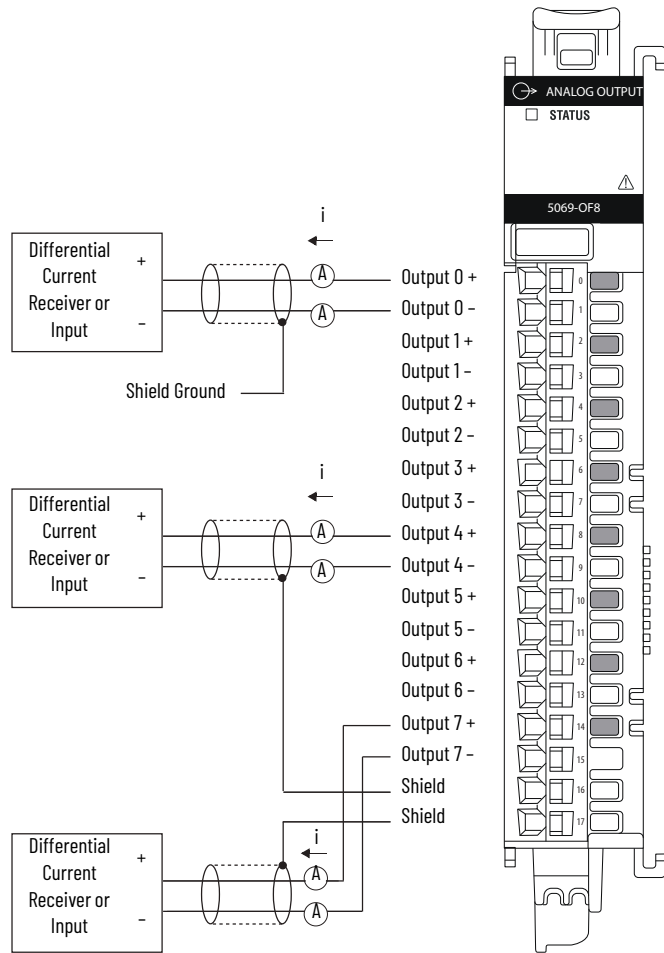
### 5069-OF8 Wiring Diagram - Current Mode

#### Channel Connections

The diagram shows devices that are connected to channels 0, 4, and 7. You are not restricted to using only those channels. You can connect devices to any channel or combination of channels as needed.

#### IMPORTANT: Remember the following:

- Place more loop devices, for example, strip chart recorders, at either **A** location in the current loop.
- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal.
- If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip.



The following figure shows a wiring diagram for the 5069-OF4 and 5069-OF4K modules when used in voltage mode.

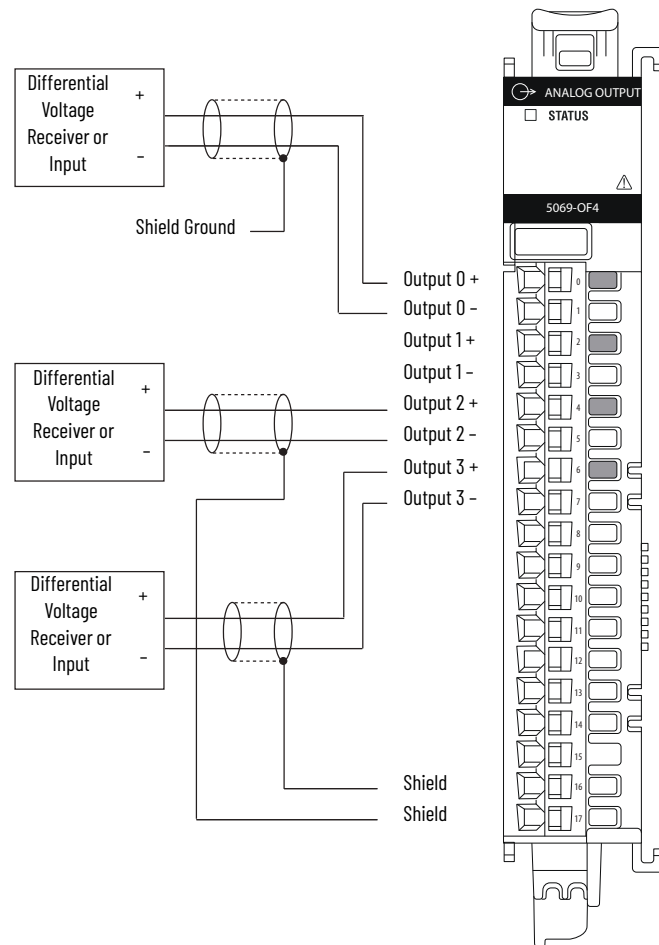
### 5069-OF4 and 5069-OF4K Wiring Diagram - Voltage Mode

#### Channel Connections

The diagram shows a device that is connected to channels 0, 2, and 3. You are not restricted to using only these channels. You can connect devices to any channel or combination of channels as needed.

**IMPORTANT:** Remember the following:

- This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal.
- If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip.
- The 5069-OF4K module uses the same wiring diagram as shown for the 5069-OF4 module.



The following figure shows a wiring diagram for the 5069-OF8 module when used in voltage mode.

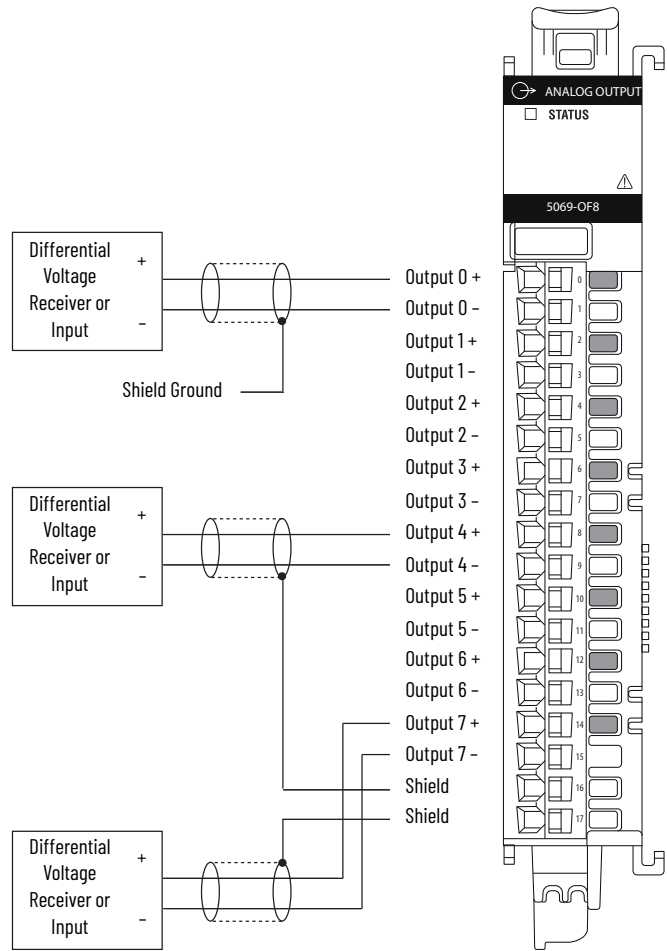
### 5069-OF8 Wiring Diagram - Voltage Mode

#### Channel Connections

The diagram shows a device that is connected to channels 0, 2, and 3. You are not restricted to using only these channels. You can connect devices to any channel or combination of channels as needed.

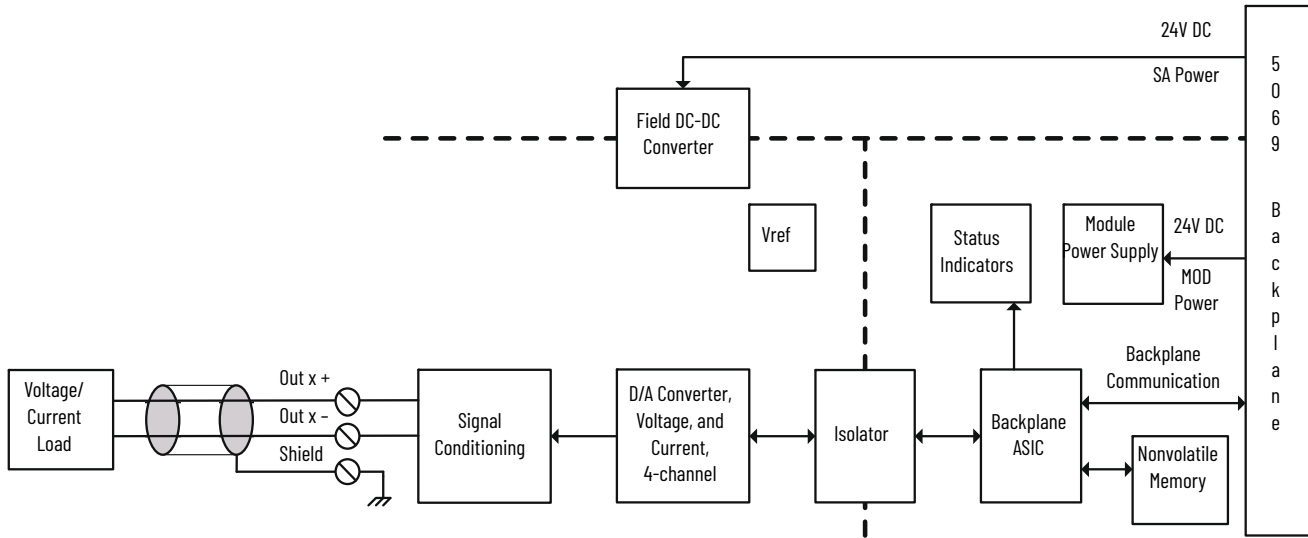
**IMPORTANT:** This module has only two shield terminals. Compact 5000 I/O module RTBs only support one wire per terminal.

If you connect more than two devices to the module, you can ground two devices at the shield terminals. You must ground the remaining devices somewhere else, such as, to the DIN rail via a terminal strip.



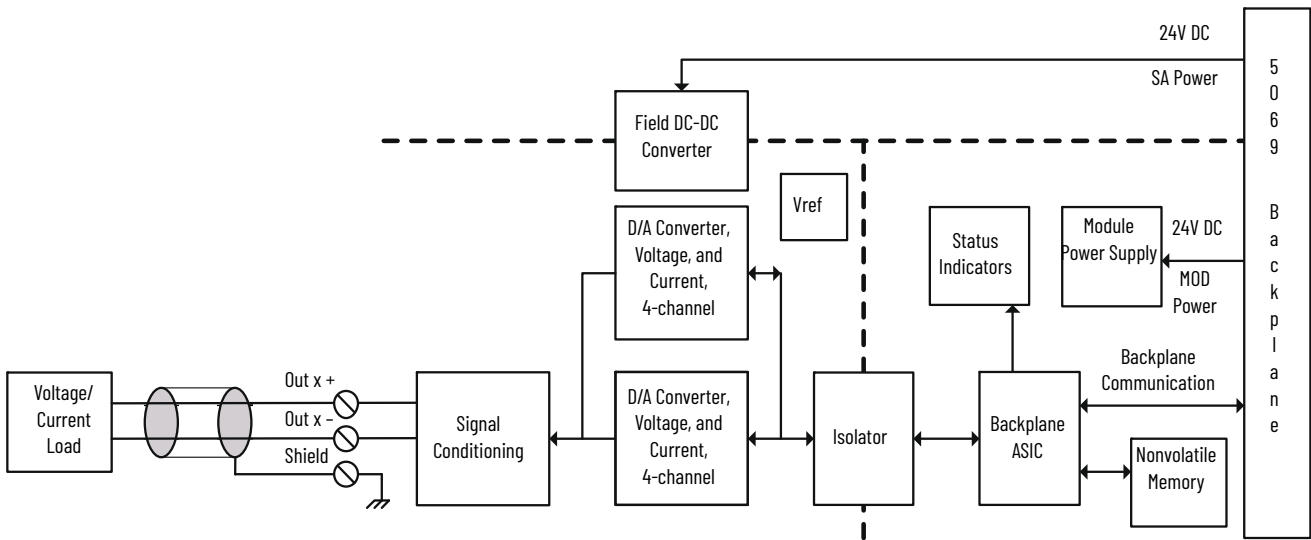
The following figure shows a functional block diagram for the 5069-0F4 and 5069-0F4K modules.

**5069-0F4 and 5069-0F4K Functional Block Diagram**



The following figure shows a functional block diagram for the 5069-0F8 module.

**5069-0F8 Functional Block Diagram**



**Technical Specifications - 5069-OF4, 5069-OF4K, 5069-OF8**

<b>Attribute</b>	<b>5069-OF4, 5069-OF4K</b>	<b>5069-OF8</b>
Outputs	4 voltage or current	8 voltage or current
Output range, voltage	± 10V 0...10V 0...5V	
Output range, current	0...20 mA 4...20 mA	
Resolution	16 bits across ± 10.5V - 320 µV/bit 16 bits across 10.5V - 160 µV/bit 16 bits across 5.25V - 80 µV/bit 16 bits across 21 mA - 320 nA/bit	
Drive capability	Voltage - 1000 Ω min Current - 500 Ω max	
Capacitive load, max (voltage mode only)	1 µF	
Inductive load, max (current mode only)	1 mH	
Open circuit detection	Current mode only	
Short circuit detection	Voltage mode only - output electronically limited to 16 mA or less	
Data format	IEEE 32-bit floating point	
Module conversion method	R-Ladder DAC, monotonicity with no missing codes	
Conversion time per channel	25 µs	
Scan time • Per group 0...3 (OF4/OF8) • Per group 0...7 (OF8 only)	1.0 ms 2.0 ms	
Step response time to 63% of value	Voltage mode - 18 µs max Current mode - 1 ms max	
Overvoltage protection, max	± 32V DC	
Repeatability	0.05%	
Calibrated accuracy at 25 °C (77 °F)	Voltage - 0.10% full scale Current - 0.10% full scale	
Accuracy drift with temperature	Voltage - 0.30% full scale Current - 0.50% full scale	

## General Specifications - 5069-OF4, 5069-OF4K, and 5069-OF8

Attribute	5069-OF4, 5069-OF4K	5069-OF8
Voltage and current ratings		
Analog output ratings	+/-10V DC, 0...20 mA per channel	
MOD Power	75 mA @ 18...32V DC	
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC	
SA Power	150 mA @ 18...32V DC	250 mA @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 18...32V DC	
Power dissipation, max	3.3 W	5.3 W
Thermal dissipation, max	11.3 BTU/hr	18.1 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type 50V Functional Isolation between SA power and output ports No isolation between individual output ports	
Calibration methods	Factory Calibrated User-performed (optional)	
Module keying	Electronic keying via programming software	
Indicators	1 green/red module status indicator 4 yellow/red I/O status indicators	1 green/red module status indicator 8 yellow/red I/O status indicators
Slot width	1	
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)	
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.	
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.	
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N•m (3.5 lb•in)	
RTB keying	None	
Wire category <sup>(3)</sup>	2 - shielded input ports 2 - power ports 1 wire per terminal for each signal port	
Wire size		
5069-RTB18-SPRING removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation	
5069-RTB18-SCREW removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation	
Insulation stripping length		
5069-RTB18-SPRING connections	10 mm (0.39 in.)	
5069-RTB18-SCREW connections	12 mm (0.47 in.)	

**General Specifications - 5069-0F4, 5069-0F4K, and 5069-0F8**

Attribute	5069-0F4, 5069-0F4K	5069-0F8
Weight, approx	175 g (0.39 lb)	
Enclosure type	None (open-style)	
North American temp code	T4	
ATEX temp code	T4	
IECEx temp code	T4	

- (1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-0F4, 5069-0F4K, and 5069-0F8**

Attribute	5069-0F4, 5069-0F4K, 5069-0F8
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...200 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz



**Environmental Specifications - 5069-OF4, 5069-OF4K, and 5069-OF8**

<b>Attribute</b>	<b>5069-OF4, 5069-OF4K, 5069-OF8</b>
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on shielded output ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±2 kV line-earth (CM) on shielded output ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on MOD Power port

**Certifications - 5069-OF4, 5069-OF4K, and 5069-OF8**

<b>Certification<sup>(1)</sup></b>	<b>5069-OF4, 5069-OF4K, 5069-OF8</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>• EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>• EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-0; General Requirements</li> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• II 3 G Ex nA IIC T4 Gc</li> <li>• DEMKO 15 ATEX 1484X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>• IEC 60079-0; General Requirements</li> <li>• IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• II 3 G Ex nA IIC T4 Gc</li> <li>• IECEX UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## Safety I/O Modules

I/O Type	Cat. No.	Description	Page
DC safety sinking input	5069-IB8S	18...32V DC 8-point, safety sinking input module	82
	5069-IB8SK	18...32V DC 8-point, conformal coated safety sinking input module	
DC safety output	5069-OBV8S	18...32V DC 8-point, safety output module that can be used as a Bipolar output module or sourcing output module	90
	5069-OBV8SK	18...32V DC 8-point, conformal coated safety output module that can be used as a Bipolar output module or sourcing output module	

### 5069-IB8S and 5069-IB8SK Safety Sinking Input Modules

When the module is wired as shown, it is suitable for applications that are rated up to, and including, **Category 3** as defined in ISO 13849-1.

**IMPORTANT:** Remember the following:

- The switches are suitable for applications that are rated up to, and including, SIL CL3, PLe, Cat. 3.
- The light curtain is suitable for applications that are rated up to, and including, SIL CL3, PLe, Cat. 4.

**Channel Connections**

The diagram shows devices that are connected to safety input channels 0, 1, 6, and 7. You are not restricted to using only those channels.

You can connect devices to any safety input channel or combination of channels as needed.

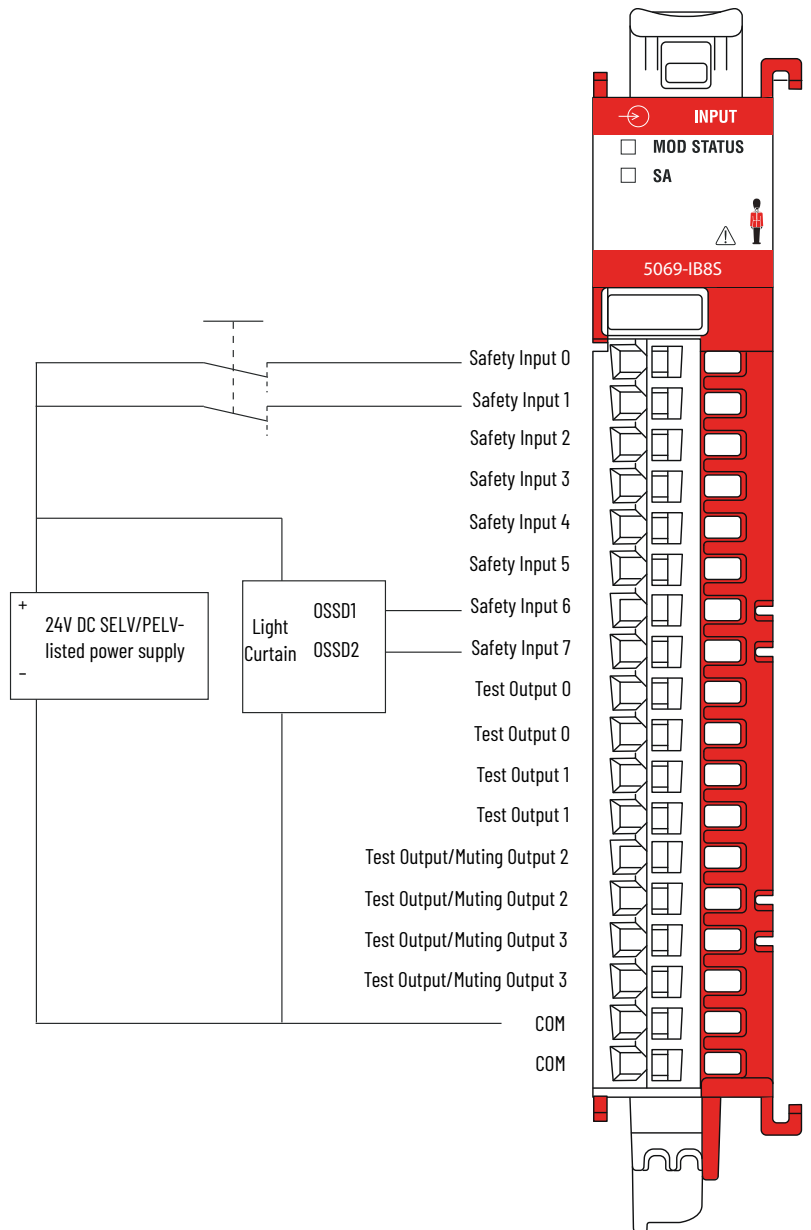
**SA Power**

Connections to an external power supply that provides SA power via the SA Power RTB on one of the following:

- Compact GuardLogix 5380 controller
- 5069-AENTR or 5069-AENZTR EtherNet/IP Adapter
- 5069-FPD field potential distributor

**IMPORTANT:** Remember the following:

- The 5069-IB8S and 5069-IB8SK modules use DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete the following steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- The SA Power to adjacent SA Power electrical isolation that the 5069-FPD field potential distributor provides has a rating of 240V AC (continuous) reinforced insulation type.



When the module is wired as shown, and the requirements listed are met in the project of the safety controller, it is suitable for applications that are rated up to, and including, **Category 4** as defined in ISO 13849-1. To achieve that suitability rating, you may have to perform diagnostic testing and monitoring of the safety function.

One diagnostic test method is to configure the safety input channel for Safety Pulse Test to test the circuit for short circuits to 24V DC. Safety input pairs must be associated with different Test Output sources.

### Channel Connections

The diagram shows devices that are connected to safety input channels 0 and 1, and to test outputs 0 and 1.

You are not restricted to using only those safety input channels.

You can connect devices to any channel or combination of channels as needed.

### SA Power

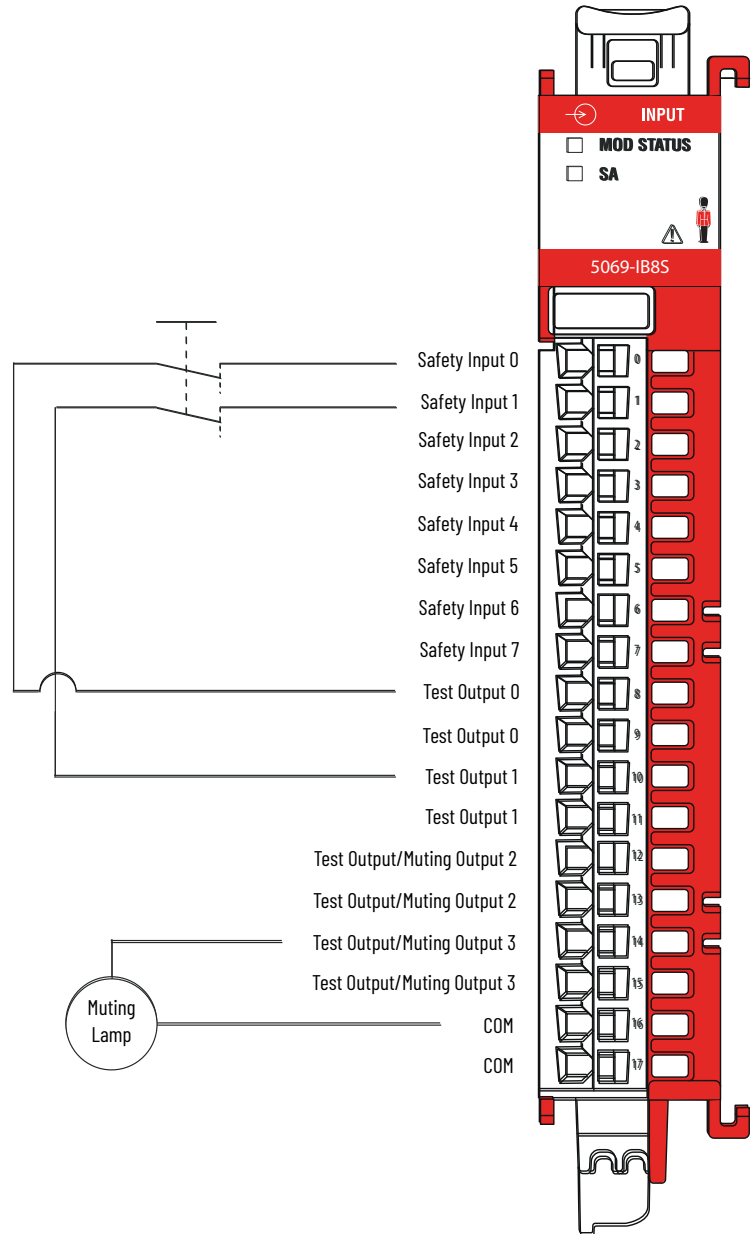
Connections to an external power supply that provides SA power via the SA Power RTB on one of the following:

- Compact GuardLogix 5380 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

**IMPORTANT:** Remember the following:

- The 5069-IB8S and 5069-IB8SK modules use DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- The SA Power to adjacent SA Power electrical isolation that the 5069-FPD field potential distributor provides has a rating of 240V AC (continuous) reinforced insulation type.

**IMPORTANT:** When the power supply and muting lamp are configured for a test output, you must connect the return wire on the device to a COM point on the module.



When the module is wired as shown, and the requirements listed are met in the project of the safety controller, it is suitable for applications that are rated up to, and including, **Category 3** as defined in ISO 13849-1.

To achieve that suitability rating, you must meet the following requirements:

- Fault Exclusion is External Wiring fault.
- Use a SIL CL3, PLd, Cat. 3 qualified sensor.
- One of the following configuration combinations:
  - Input Point Mode = Safety Pulse Test
  - Test Output Mode = Pulse Test
  - Input Point Mode = Safety
  - Test Output Mode = Power Supply

**Channel Connections**

The diagram shows a device that is connected to safety input channel 0 and test output channel 0. You are not restricted to using only those channels.

You can connect devices to any safety input channel or combination of channels as needed.

We recommend that you connect even-numbered input points to even-numbered test output points and odd-numbered input points to odd-numbered test output points.

This wiring practice can maximize diagnostic independence and separation.

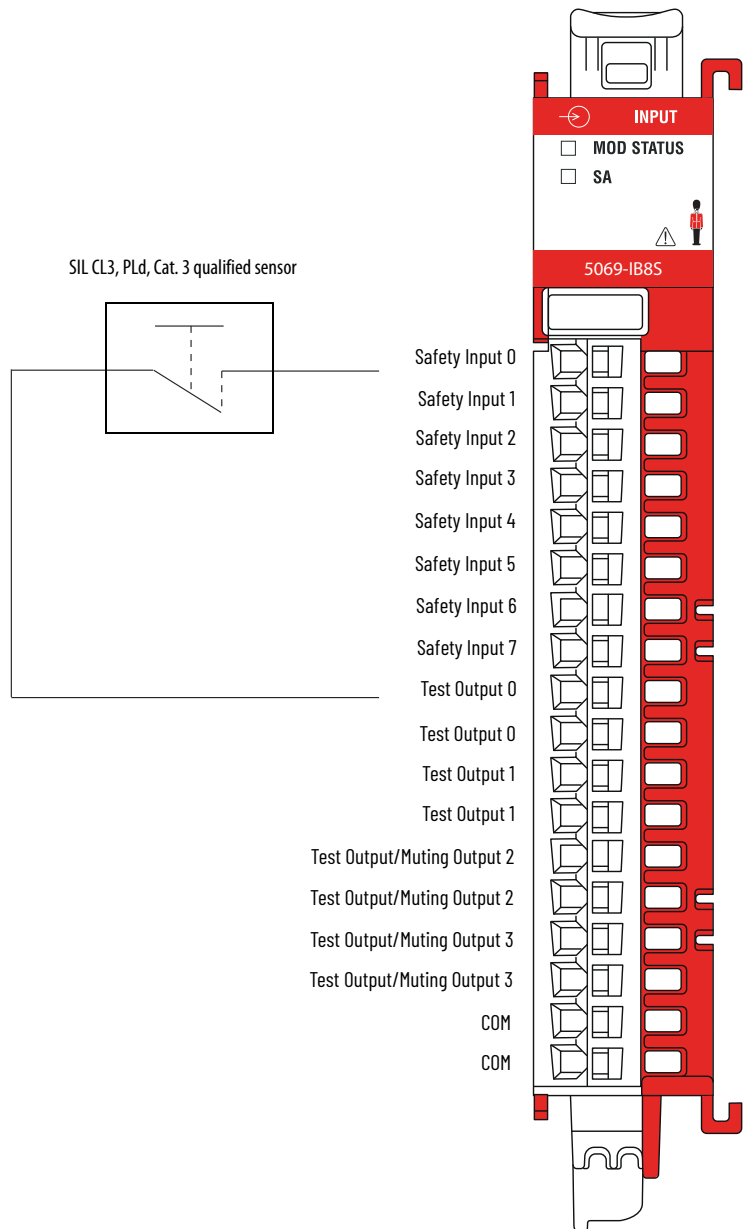
**SA Power**

Connections to an external power supply that provides SA power via the SA Power RTB on one of the following:

- Compact GuardLogix 5380 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

**IMPORTANT:** Remember the following:

- The 5069-IB8S and 5069-IB8SK modules use DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that uses AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- The SA Power to adjacent SA Power electrical isolation that the 5069-FPD field potential distributor provides has a rating of 240V AC (continuous) reinforced insulation type.



**Technical Specifications - 5069-IB8S and 5069-IB8SK**

<b>Attribute</b>	<b>5069-IB8S, 5069-IB8SK</b>
<b>Safety Inputs</b>	
On-state voltage, min	10V DC
On-state voltage, nom	24V DC
On-state voltage, max	32V DC
On-state current, min	1.8 mA
On-state current, nom	2 mA
On-state current, max	2.2 mA
Off-state voltage, max	5V DC
Off-state current, max	1.5 mA
Input delay time	
Off to On	User selectable time: 0 ms...50 ms Default is 0 ms
On to Off	User selectable time: 0 ms...50 ms Default is 0 ms
Safety integrity Level (SIL)	SIL CL3, PLe, Cat. 4
Safety reaction time (SRT)	6 ms
<b>Test Outputs</b>	
Output current per channel, max	0.3 A
Output current per group, max	1.2 A
Output current per module, max	1.2 A
Test output pulse width	< 700 $\mu$ s
Test output pulse period	< 100 ms
Test output field capacitance, max	0.5 $\mu$ F
Test output short circuit protection	Yes
Test output leakage current	1.5 mA
Test output overvoltage protection <sup>(1)</sup>	Yes
SA Power reverse voltage protection	Yes
SA Power overvoltage protection, max	36.5V DC
Timestamp of inputs	No
CIP Sync™	Yes
Overrides	No
Pulse latching	No
Events	No
Pattern matching	No
Extended counters	No
Scheduled outputs	No
Power consumption	3.8 W

(1) Also known as Thermal Shutoff.

**General Specifications - 5069-IB8S, 5069-IB8SK**

<b>Attribute</b>	<b>5069-IB8S, 5069-IB8SK</b>
Inputs	8 channels, safety sinking
Test Outputs	2 test output channels 2 test output/muting output channels
Voltage category	12/24V DC source
Voltage and current ratings - System is mounted in Horizontal orientation	
Input Rating	2.5 mA per channel
Test Output Rating	300 mA per channel
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	5 A @ 18...32V DC
SA Power	100 mA @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 18...32V DC
Voltage and current ratings - System is mounted in any orientation other than Horizontal ( <b>module de-rating</b> ) <sup>(3)</sup>	
Input Rating	2.5 mA per channel
Test Output Rating	200 mA per channel
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	5 A @ 18...32V DC
SA Power	100 mA @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup>	5 A @ 18...32V DC
Do not exceed 5 A MOD or SA Power Passthrough current draw in any orientation other than Horizontal.	
Power dissipation, max	3.5 W
Thermal dissipation, max	4 W
Isolation voltage	250V (continuous), Basic Insulation Type
Module keying	Electronic module keying, software configurable
Indicators	1 green/red module status indicator 1 green/red SA power status indicator 12 yellow/red I/O status indicators

**General Specifications - 5069-IB8S, 5069-IB8SK**

Attribute	5069-IB8S, 5069-IB8SK
Slot width	1
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N•m (3.5 lb•in)
RTB keying	None
Wire type	Copper
Wire category <sup>(4)</sup>	2 - signal ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SCREW removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation
5069-RTB18-SPRING removable terminal block	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation
Insulation stripping length	
5069-RTB18-SCREW connections	12 mm (0.47 in.)
5069-RTB18-SPRING connections	10 mm (0.39 in.)
Weight, approx	175 g (0.39 lb)
Enclosure type	None (open - style)
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

- (1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).
- (3) The additional supported mounting orientations are Inverted Horizontal, Vertical, Inverted Vertical, Upside Down, and Upside Up.
- (4) Use this Conductor Category information for planning conductor routing. For more information, see the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#) and the appropriate system-level installation manual.

**Environmental Specifications - 5069-IB8S, 5069-IB8SK**

<b>Attribute</b>	<b>5069-IB8S, 5069-IB8SK</b>
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Temperature, surrounding air, max.	
System is mounted in Horizontal orientation	60 °C (140 °F)
System is mounted in any orientation other than Horizontal (module de-rating) <sup>(1)</sup>	50 °C (122 °F)
Temperature, ambient, max	
System is mounted in Horizontal orientation	60 °C (140 °F)
System is mounted in any orientation other than Horizontal (module de-rating) <sup>(1)</sup>	50 °C (122 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	4.5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	20V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 20V/m with 200 Hz 50% pulse 100% AM at 900 MHz 20V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on DC supply ports

(1) The additional supported mounting orientations are Inverted Horizontal, Vertical, Inverted Vertical, Upside Down, and Upside Up.



## Certifications - 5069-IB8S, 5069-IB8SK

Certification <sup>(1)</sup>	5069-IB8S, 5069-IB8SK
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/42/EC MD, compliant with: <ul style="list-style-type: none"> <li>• EN 60204-1; Electrical equipment of machines</li> <li>• EN ISO 13849-1; Safety-related parts of control systems</li> <li>• EN 62061; Functional safety of safety-related control systems</li> <li>• Cat. 4/PLe according to EN ISO 13849-1, and SIL 3 according to EN 62601/IEC 61508/IEC 62511</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>• EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> <li>• EN 61000-6-4; Industrial Emissions</li> </ul>
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-0; General Requirements</li> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• Ex nA IIC T4 Gc</li> <li>• DEMKO 18 ATEX 2019X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>• IEC 60079-0; General Requirements</li> <li>• IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• Ex nA IIC T4 Gc</li> <li>• IECEX UL 18.0014X</li> </ul>
TÜV	TÜV Certified for Functional Safety, <sup>(2)</sup> <ul style="list-style-type: none"> <li>• Capable of SIL 3, CAT. 4/PLe</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> <li>• Article 58-2 of Radio Waves Act, Clause 3</li> </ul>

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

(2) When used with specified firmware revisions. See the Product Safety Certificate at <http://www.rockwellautomation.com/global/certification/overview.page> for a full list of safety-related certifications.

## 5069-OBV8S and 5069-OBV8SK Safety Output Modules

You can use the safety output modules in Bipolar mode or Sourcing mode.

### *Bipolar Mode*

When the module is wired as shown, and the requirements listed are met in the project of the safety controller, it is suitable for applications that are rated up to, and including, **Category 4** as defined in ISO 13849-1.

To achieve that suitability rating, you may have to perform diagnostic testing and monitoring of the safety function. One diagnostic test method is to configure the safety output channel for Safety Pulse Test to test the circuit for short circuits to 24V DC.

- We **strongly recommend** that you connect separate shielded cables to the P terminal and the N terminal to reduce the possibility of a wire short between the terminals. If a wire-short fault is detected across the P-N pair, the module outputs are turned off, but the actuator that is connected to it remains on.
- Configure the application so that No Load and Overload conditions are only detectable at the P terminal.

For Category 4 applications, if your application remains in safe state, that is, the output is off, for a prolonged duration, we recommend that you take one of the following actions:

- Apply output monitoring at the actuator. The monitoring can be direct or indirect.
- Limit the safe state to no more than 24 hours.
- Conduct functional test if safe state dwell time increases.

### Actuator LA Power

In this wiring configuration, you must connect the **LA+ terminal to an SELV/PELV-listed** power supply.

The LA+ and LA- on the actuator must be connected to the same power supply as the LA+ and LA- on the module.

### Connection Pairs

The terminals for each channel function as a Bipolar connection pair when you use a 5069-OBV8S or 5069-OB8VSK module in Bipolar switching mode. For example, the Safety Output 0 P (Sourcing) terminal and Safety Output 0 N (Sinking) terminal are a Bipolar connection pair. That is, they are a P-N pair.

When the module is in Bipolar switching mode, you must connect the device to both terminals.

### Channel Connections

This wiring example shows connections to the P-N pair for Safety Output 0. You are not limited to using channel 0 in this mode. You can use all channel pairs as determined by your application.

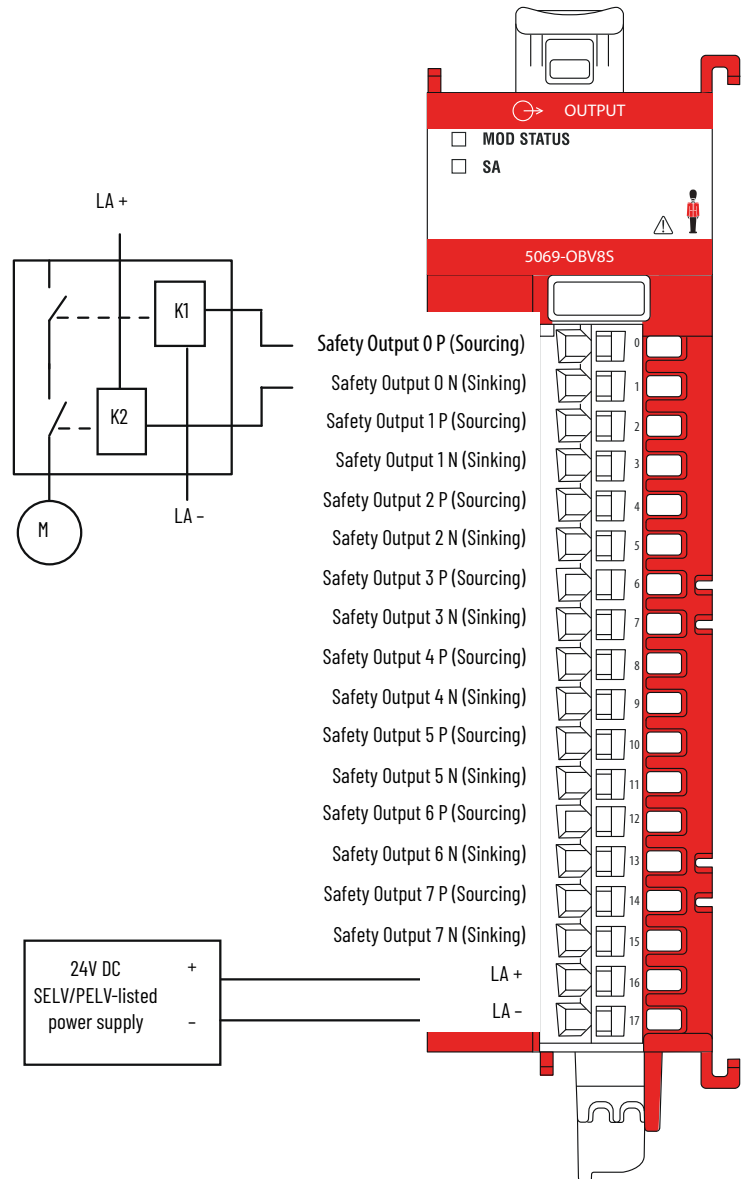
### LA Power

The Local Actuator (LA+ and LA-) power connections are used to supply field-side power to the module.

- The 5069-OBV8S and 5069-OBV8SK modules **do not draw current from the SA Power bus.**

Still, the modules are DC-type modules and you must install them on a DC SA Power bus.

- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete the following steps.
  - Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  - Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  - Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- We **strongly recommend** that, if you have a direct connection between the safety output module and an input module and those modules are powered by separate power supplies, that you connect SA- and LA- together. This practice helps to eliminate grounding float from disrupting diagnostics.



When the module is wired as shown, and the requirements listed are met in the project of the safety controller, it is suitable for applications that are rated up to, and including, **Category 4** as defined in ISO 13849-1.

To achieve that suitability rating, you may have to perform diagnostic testing and monitoring of the safety function. One diagnostic test method is to configure the safety output channel for Safety Pulse Test to test the circuit for short circuits to 24V DC. Configure the application so that a No Load fault can only be detected if the wires from both the P- terminal and the N- terminal are disconnected.

For Category 4 applications, if your application remains in safe state, that is, the output is off, for a prolonged duration, we recommend that you take one of the following actions:

- Apply output monitoring at the actuator. The monitoring can be direct or indirect.
- Limit the safe state to no more than 24 hours.
- Conduct functional test if safe state dwell time increases.

**Connection Pairs**

The terminals for each channel function as a Bipolar connection pair when you use a 5069-OBV8S or 5069-OB8VSK module in Bipolar switching mode. For example, the Safety Output 0 P (Sourcing) terminal and Safety Output 0 N (Sinking) terminal are a Bipolar connection pair. That is, they are a P-N pair. When the module is in Bipolar switching mode, you must connect the device to both terminals.

**Channel Connections**

This wiring example shows connections to the P-N pair for Safety Output 0. You are not limited to using channel 0 in this mode. You can use all channel pairs as determined by your application.

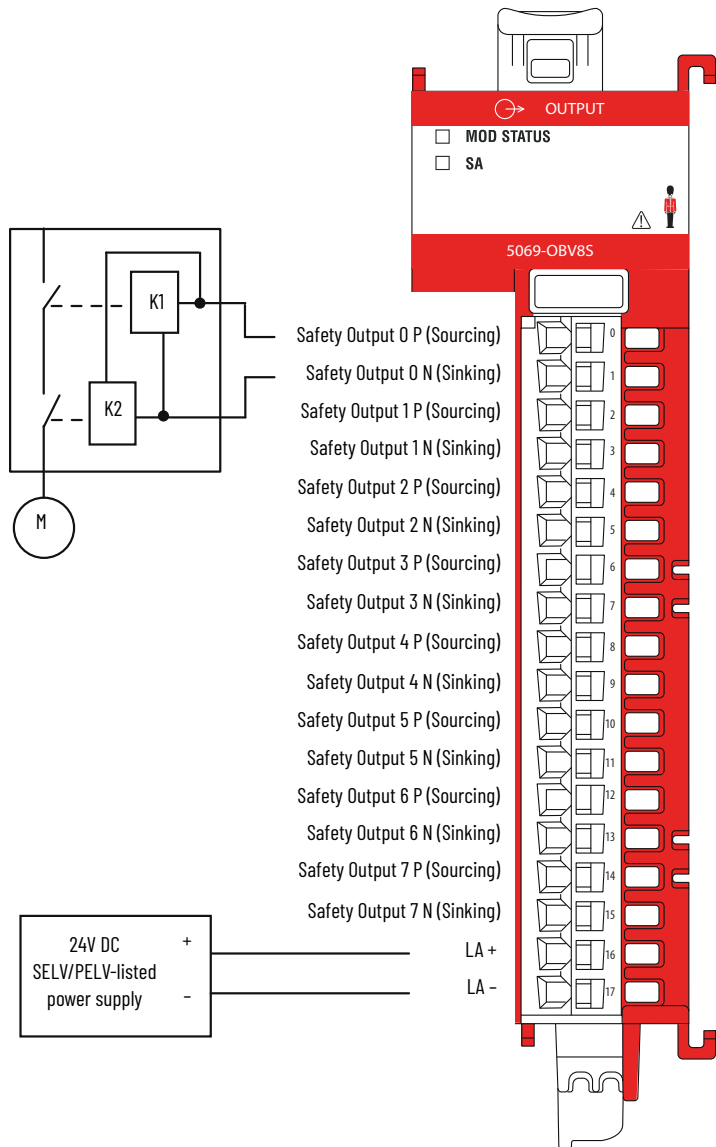
**LA Power**

The Local Actuator (LA+ and LA-) power connections are used to supply field-side power to the module.

- The 5069-OBV8S and 5069-OB8VSK modules **do not draw current from the SA Power bus.**

Still, the modules are DC type modules, and you must install them on a DC SA Power bus.

- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete the following steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- We **strongly recommend** that, if you have a direct connection between the safety output module and an input module and those modules are powered by separate power supplies, that you connect SA- and LA- together. This practice helps to eliminate grounding float from disrupting diagnostics.



When the module is wired as shown, and the requirements listed are met in the project of the safety controller, it is suitable for applications that are rated up to, and including, **Category 4** as defined in ISO 13849-1. To achieve that suitability rating, you may have to perform diagnostic testing and monitoring of the safety function. One diagnostic test method is to configure the safety output channel for Safety Pulse Test to test the circuit for short circuits to 24V DC.

For Category 4 applications, if your application remains in safe state, that is, the output is off, for a prolonged duration, we recommend that you take one of the following actions:

- Apply output monitoring at the actuator. The monitoring can be direct or indirect.
- Limit the safe state to no more than 24 hours.
- Conduct functional test if safe state dwell time increases.
- A qualified actuator must be installed, for example, in accordance with IEC 60947.

### Connection Pairs

The terminals for each channel function as a Bipolar connection pair when you use a 5069-OBV8S or 5069-OBV8SK module in Bipolar switching mode. For example, the Safety Output 0 P (Sourcing) terminal and Safety Output 0 N (Sinking) terminal are a Bipolar connection pair. That is, they are a P-N pair.

When the module is in Bipolar switching mode, you must connect the device to both terminals.

### Channel Connections

This wiring example shows connections to the P-N pair for Safety Output 0. You are not limited to using channel 0 in this mode. You can use all channel pairs as determined by your application.

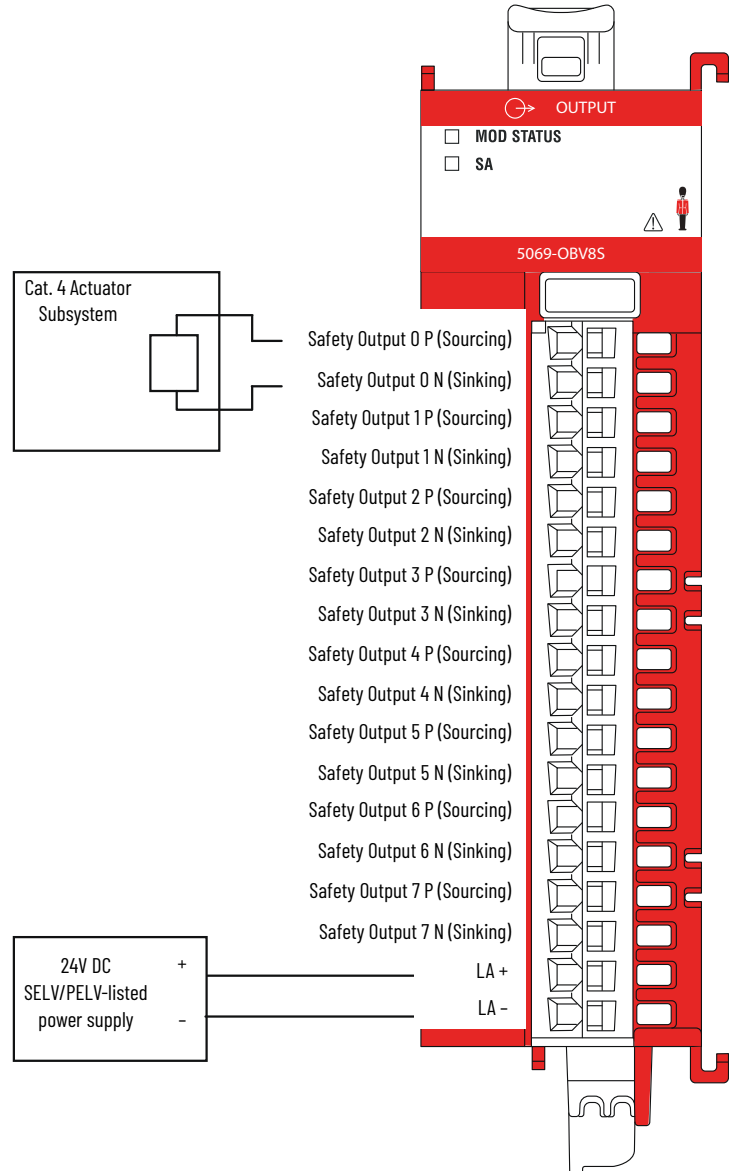
### LA Power

The Local Actuator (LA+ and LA-) power connections are used to supply field-side power to the module.

- The 5069-OBV8S and 5069-OBV8SK modules **do not draw current from the SA Power bus.**

Still, the modules are DC type modules, and you must install them on a DC SA Power bus

- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete the following steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- We **strongly recommend** that if, you have a direct connection between the safety output module and an input module and those modules are powered by separate power supplies, that you connect SA- and LA- together. This practice helps to eliminate grounding float from disrupting diagnostics.
- The SA Power to adjacent SA Power electrical isolation that the 5069-FPD field potential distributor provides has a rating of 240V AC (continuous) reinforced insulation type.



## Sourcing Mode

When the module is wired as shown, it is suitable for applications that are rated up to, and including, **Category 2** as defined in ISO 13849-1.

To achieve that suitability rating, you may have to perform diagnostic testing and monitoring of the safety function. One diagnostic test method is to configure the safety output channel for Safety Pulse Test to test the circuit for short circuits to 24V DC.

### Channel Connections

This wiring example shows connection to Safety Output 0. You are not limited to using channel 0 in this mode. You can use all channels as determined by your application.

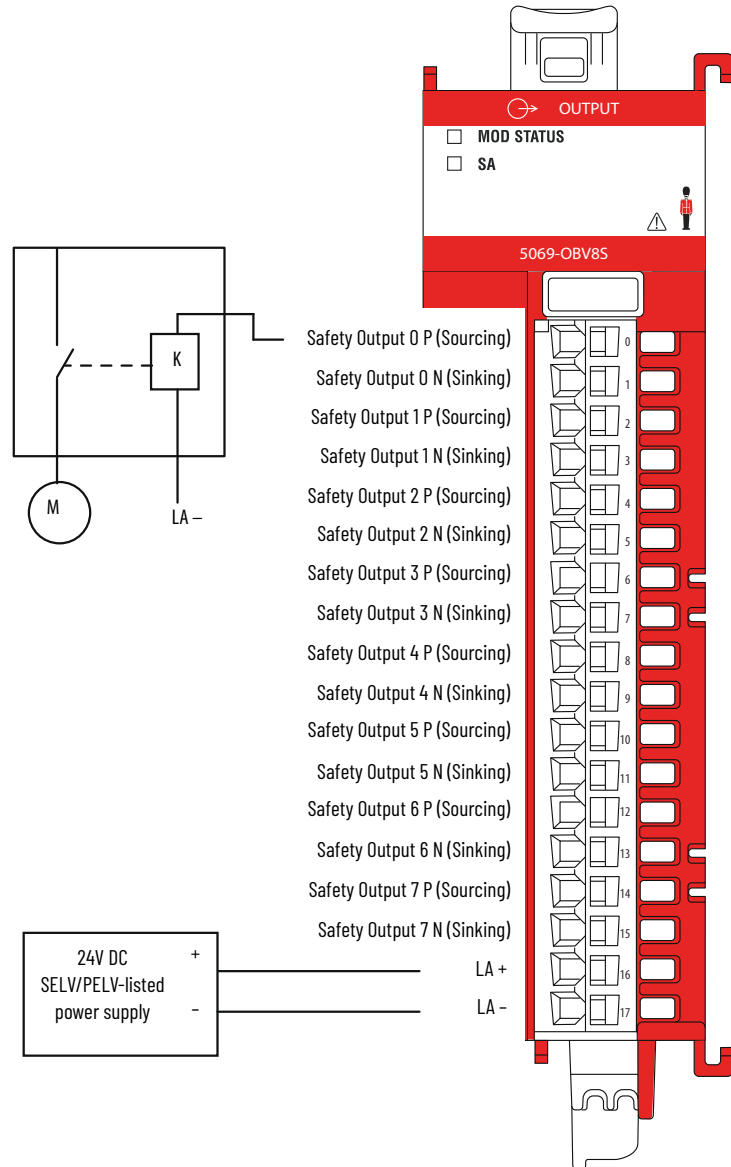
### LA Power

The Local Actuator (LA+ and LA-) power connections are used to supply field-side power to the module.

- The 5069-OBV8S and 5069-OBV8SK modules **do not draw current from the SA Power bus.**

Still, the modules are DC type modules, and you must install them on a DC SA Power bus

- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete the following steps.
  - Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  - Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  - Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- We **strongly recommend** that, if you have a direct connection between the safety output module and an input module and those modules are powered by separate power supplies, that you connect SA- and LA- together. This practice helps to eliminate grounding float from disrupting diagnostics.



When the module is wired as shown, it is suitable for applications that are rated up to, and including, **Category 4** as defined in ISO 13849-1.

To achieve that suitability rating, you may have to perform diagnostic testing and monitoring of the safety function. One diagnostic test method is to configure the safety output channel for Safety Pulse Test to test the circuit for short circuits to 24V DC.

For Category 4 applications, if your application remains in safe state, that is, the output is off, for a prolonged duration, we recommend that you take one of these actions:

- Apply output monitoring at the actuator. The monitoring can be direct or indirect.
- Limit the safe state to no more than 24 hours.
- Conduct functional test if safe state dwell time increases.

#### Connection Pairs

When you use dual-channel sourcing wiring on the 5069-OBV8S or 5069-OBV8SK module, you must connect the devices to dual-channel connection pairs. For example, the devices are connected to channels 4 and 5 because they are a connection pair. The following channels are dual-channel connection pairs:

- Channels 0 and 1 (shown)
- Channels 2 and 3
- Channels 4 and 5
- Channels 6 and 7

#### Channel Connections

This wiring example shows connections to Safety Output 0 P and Safety Output 1 P. You are not limited to using channels 0 and 1 in this mode. You can use all channel pairs as determined by your application.

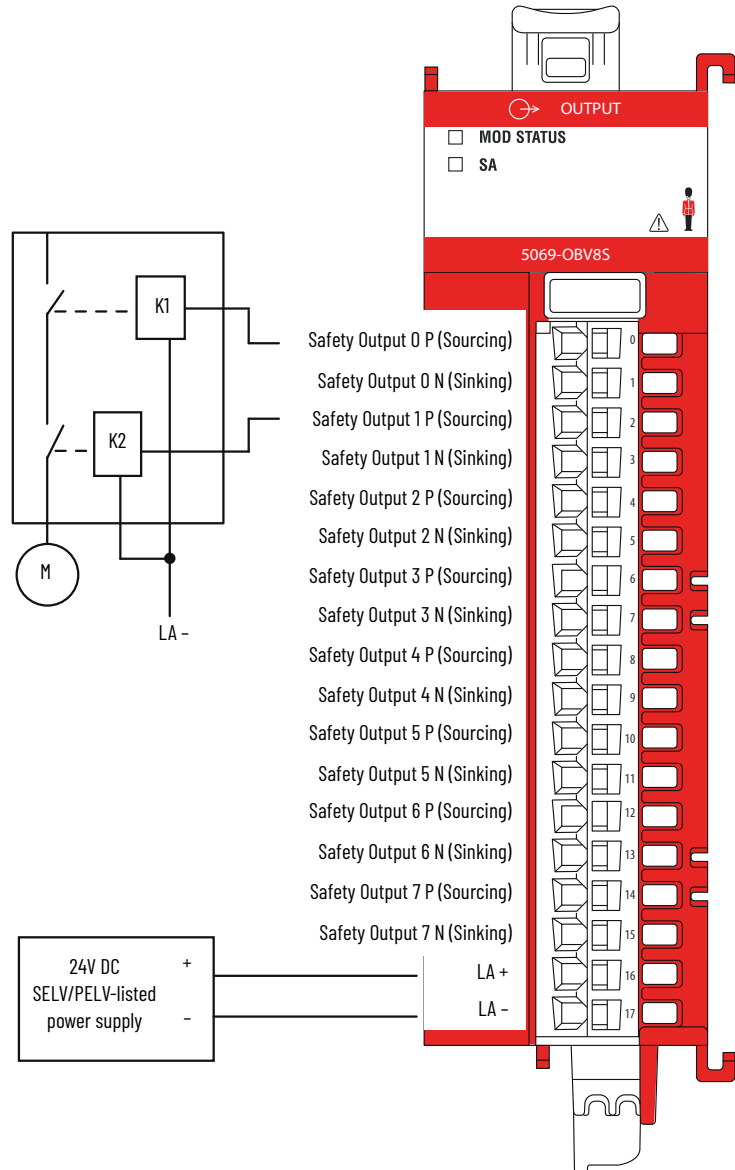
#### LA Power

The Local Actuator (LA+ and LA-) power connections are used to supply field-side power to the module.

- The 5069-OBV8S and 5069-OBV8SK modules **do not draw current from the SA Power bus.**

Still, the modules are DC type modules, and you must install them on a DC SA Power bus

- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- We **strongly recommend** that, if you have a direct connection between the safety output module and an input module and those modules are powered by separate power supplies, that you connect SA- and LA- together. This practice helps to eliminate grounding float from disrupting diagnostics.



When the module is wired as shown on [page 96](#), and the requirements listed are met in the project of the safety controller, it is suitable for applications that are rated up to, and including, **Category 4** as defined in ISO 13849-1.

To achieve that suitability rating, you may have to perform diagnostic testing and monitoring of the safety function. One diagnostic test method is to configure the safety output channel for Safety Pulse Test to test the circuit for short circuits to 24V DC.

- All power source cables must be installed separately, for example, with a separate cable duct or shielded cable. Power source cables are connections to the MOD+, SA+, or LA+ terminals. Otherwise, a Short Circuit condition between SA+ and P can be detected and the output is turned off but the actuator that is connected to it remains on.
- You must connect two ground terminals. Otherwise, the maximum residual current at signal 0 cannot be maintained if only one ground line is connected and it is interrupted.
- A qualified actuator must be installed, for example, in accordance with IEC 60947.

For Category 4 applications, if your application remains in safe state, that is, the output is off, for a prolonged duration, we recommend that you take one of these actions:

- Apply output monitoring at the actuator. The monitoring can be direct or indirect.
- Limit the safe state to no more than 24 hours.
- Conduct functional test if safe state dwell time increases.

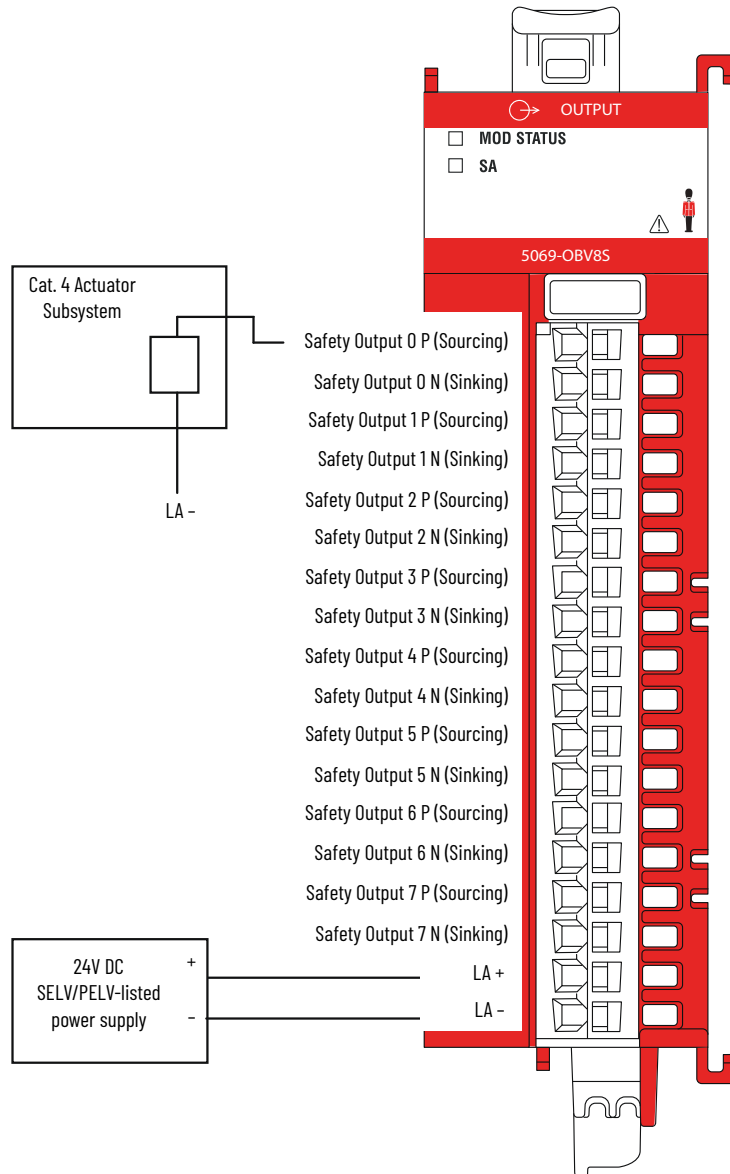
**Channel Connections**

This wiring example shows connections to Safety Output 0. You are not limited to using channel 0 in this mode. You can use all channels as determined by your application.

**LA Power**

The Local Actuator (LA+ and LA-) power connections are used to supply field-side power to the module.

- The 5069-OBV8S and 5069-OBV8SK modules **do not draw current from the SA Power bus.**
- Still, the modules are DC type modules, and you must install them on a DC SA Power bus
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
  - You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
    1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
    2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
    3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
  - We **strongly recommend** that, if you have a direct connection between the safety output module and an input module and those modules are powered by separate power supplies, that you connect SA- and LA- together. This practice helps to eliminate grounding float from disrupting diagnostics.





**Technical Specifications - 5069-OBV8S, 5069-OBV8SK**

<b>Attribute</b>	<b>5069-OBV8S, 5069-OBV8SK</b>
On-state voltage, min <sup>(1)</sup>	17.5V DC
On-state voltage, nom <sup>(1)</sup>	24V DC
On-state voltage, max <sup>(1)</sup>	32V DC
On-state voltage drop, max <sup>(1)</sup>	0.5V DC
On-state current per channel, min <sup>(1)</sup>	10 mA
Off-state voltage, max <sup>(1)</sup>	0.5V DC
Off-state leakage current per point, max <sup>(2)</sup>	1.5 mA
Output current rating per channel	1 A
Surge current per point, max	1.5 A
Output delay time (backplane to screw)	
Off to On	4 ms, max
On to Off	4 ms, max
Safety Integrity Level	SIL CL3, PLe, Cat. 4
Safety reaction time (SRT)	4.5 ms
Pulse width, min	400 µs
Field power loss detection	Yes (per point)
No load detection diagnostics	Yes (per point)
Output short circuit/overload detection	Yes (per point)
Output short circuit/overload protection	Yes (per point)
Output overtemperature detection	Yes (per point)
Output overtemperature protection	Yes (per point)
Reverse voltage protection	Yes
Overvoltage protection, max	Yes
CIP Sync	Yes
Output control in fault mode per point	No
Output states in program mode per point	Off
Output states in fault mode per point	Off
Duration of fault mode per point	Forever - Safety outputs turn off when the fault is detected and remain off until the cause of the fault is removed and the safety outputs are commanded into the safe state.

(1) Local Actuator (LA) Field Power related attributes.

(2) Recommended Loading Resistor - To limit the effects of leakage current through solid-state outputs, you can connect a loading resistor in parallel with your load. For 24V DC operation, use a 5.6 KΩ, 0.5 W resistor for transistor operation.

**General Specifications - 5069-OBV8S, 5069-OBV8SK**

<b>Attribute</b>	<b>5069-5069-OBV8S, 5069-OBV8SK</b>
Outputs	8
Voltage category	24V DC
Voltage and current ratings - System is mounted in Horizontal orientation	
Output Rating	1 A per channel
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	5 A @ 18...32V DC
LA Power	1 A per channel @ 18...32V DC 8 A per module @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup> The module does not draw SA Power current.	9.95 A @ 18...32V DC
Do not exceed 5 A MOD Power Passthrough current draw. Do not exceed 10 A or SA Power Passthrough current draw.	
Voltage and current ratings - System is mounted in any orientation other than Horizontal (module de-rating) <sup>(3)</sup>	
Output Rating	0.7 A per channel
MOD Power	75 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	5 A @ 18...32V DC
LA Power	0.7 A per channel @ 18...32V DC 5.6 A per module @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup> The module does not draw SA Power current.	5 A @ 18...32V DC
Do not exceed 5 A MOD or SA Power Passthrough current draw in any orientation other than Horizontal.	
Power dissipation, max	6.5 W
Thermal dissipation, max	6.5 W
Isolation voltage	250V (continuous), Basic Insulation Type No isolation between LA power and output ports No isolation between individual output ports
Module keying	Electronic keying via programming software
Indicators	1 green/red module status indicator 1 green/red SA power status indicator 16 yellow/red I/O status indicators
Slot width	1.5
Dimensions (HxWxD), approx	144.57 x 36 x 105.42 mm (5.69 x 1.42 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	One of these RTB types. <ul style="list-style-type: none"> <li>• 5069-RTB18-SPRING RTB</li> <li>• 5069-RTB18-SCREW RTB</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N-m (3.5 lb-in)
RTB keying	None

**General Specifications - 5069-OBV8S, 5069-OBV8SK**

Attribute	5069-5069-OBV8S, 5069-OBV8SK
Wire type	Copper
Wire category <sup>(4)</sup>	2 - signal ports 1 wire per terminal for each signal port
Wire size	
5069-RTB18-SCREW connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (9/64 in.) insulated max diameter
5069-RTB18-SPRING connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (1/8 in.) insulated max diameter
Insulation stripping length	
5069-RTB18-SCREW connections	12 mm (0.47 in.)
5069-RTB18-SPRING connections	10 mm (0.39 in.)
Weight, approx	240 g (0.53 lb.)
Enclosure type rating	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(3) The additional supported mounting orientations are Inverted Horizontal, Vertical, Inverted Vertical, Upside Down, and Upside Up.

(4) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-OBV8S, 5069-OBV8SK**

Attribute	5069-OBV8S, 5069-OBV8SK
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Temperature, surrounding air, max.	
System is mounted in Horizontal orientation	60 °C (140 °F)
System is mounted in any orientation other than Horizontal (module de-rating) <sup>(1)</sup>	50 °C (122 °F)
Temperature, ambient, max	
System is mounted in Horizontal orientation	60 °C (140 °F)
System is mounted in any orientation other than Horizontal (module de-rating) <sup>(1)</sup>	50 °C (122 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	4.5 g @ 10...500 Hz

**Environmental Specifications - 5069-OBV8S, 5069-OBV8SK**

Attribute	5069-OBV8S, 5069-OBV8SK
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	20V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 20V/m with 200 Hz 50% pulse 100% AM at 900 MHz 20V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on DC supply ports

(1) The additional supported mounting orientations are Inverted Horizontal, Vertical, Inverted Vertical, Upside Down, and Upside Up.

**Certifications - 5069-OBV8S, 5069-OBV8SK**

Certification <sup>(1)</sup>	5069-OBV8S, 5069-OBV8SK
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/42/EC MD, compliant with: <ul style="list-style-type: none"> <li>EN 60204-1; Electrical equipment of machines</li> <li>EN ISO 13849-1; Safety-related parts of control systems</li> <li>EN 62061; Functional safety of safety-related control systems</li> <li>Cat. 4/PLe according to EN ISO 13849-1, and SIL 3 according to EN 62601/IEC 61508/IEC 62511</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> <li>EN 61000-6-4; Industrial Emissions</li> </ul>
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>Ex nA IIC T4 Gc</li> <li>DEMKO 18 ATEX 2019X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>Ex nA IIC T4 Gc</li> <li>IECEX UL 18.0014X</li> </ul>
TÜV	TÜV Certified for Functional Safety; <sup>(2)</sup> <ul style="list-style-type: none"> <li>Capable of SIL 3, CAT. 4/PLe</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> <li>Article 58-2 of Radio Waves Act, Clause 3</li> </ul>

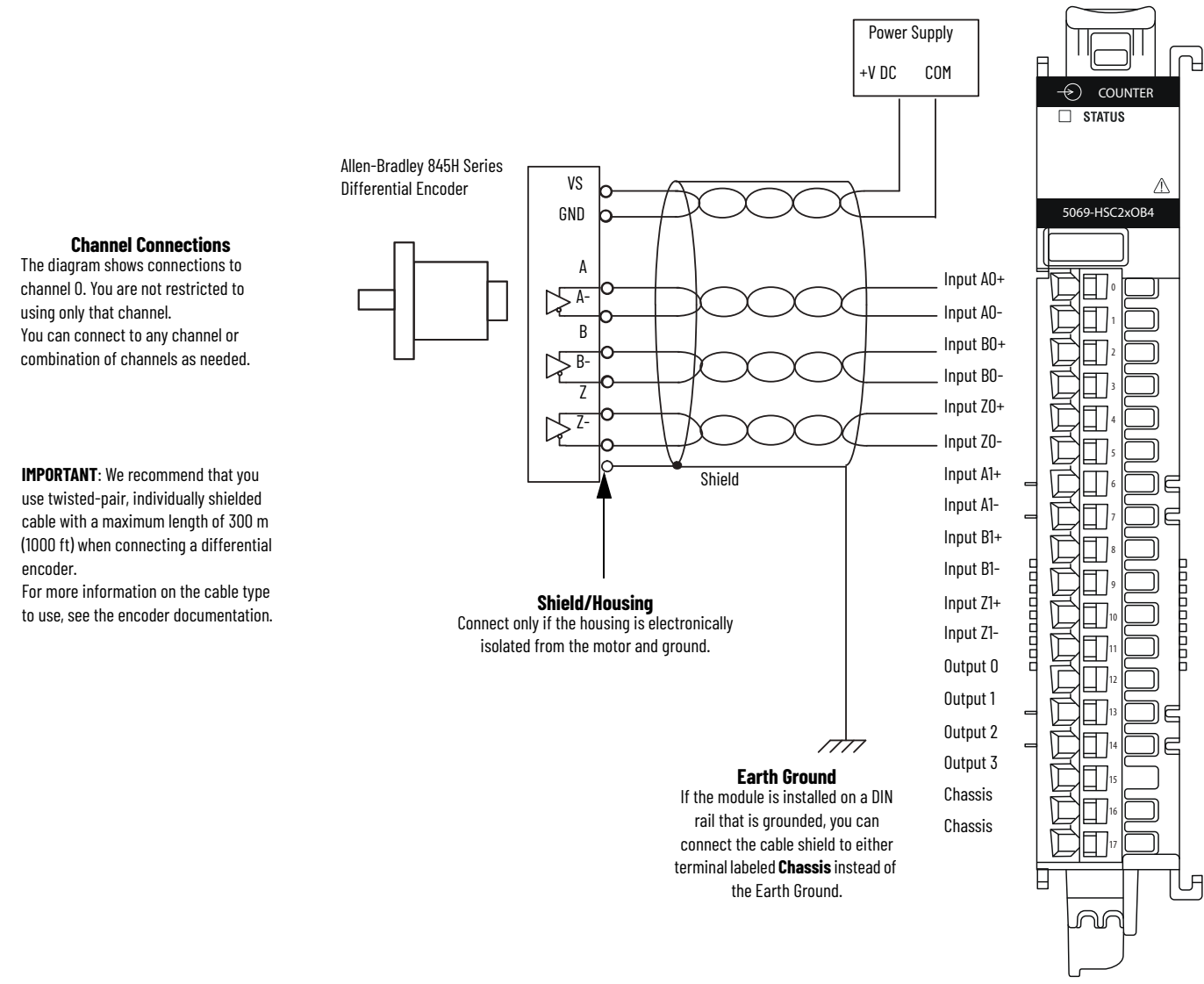
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

(2) When used with specified firmware revisions. See the Product Safety Certificate at <http://www.rockwellautomation.com/global/certification/overview.page> for a full list of safety-related certifications.

# 5069-HSC2xOB4 High-speed Counter Module

The following figure shows a wiring diagram for the 5069-HSC2xOB4 module connected to a differential encoder.

## 5069-HSC2xOB4 Wiring Diagram - Differential Encoder



The following figure shows a wiring diagram for the 5069-HSC2xOB4 module connected to a single-ended encoder.

### 5069-HSC2xOB4 Wiring Diagram - Single-ended Encoder

#### Channel Connections

The diagram shows connections to channel 0. You are not restricted to using only that channel. You can connect to any channel or combination of channels as needed.

**IMPORTANT:** We recommend that you use twisted-pair, individually shielded cable with a maximum length of 300 m (1000 ft) when connecting a single-ended encoder. For more information on the cable type to use, see the encoder documentation.

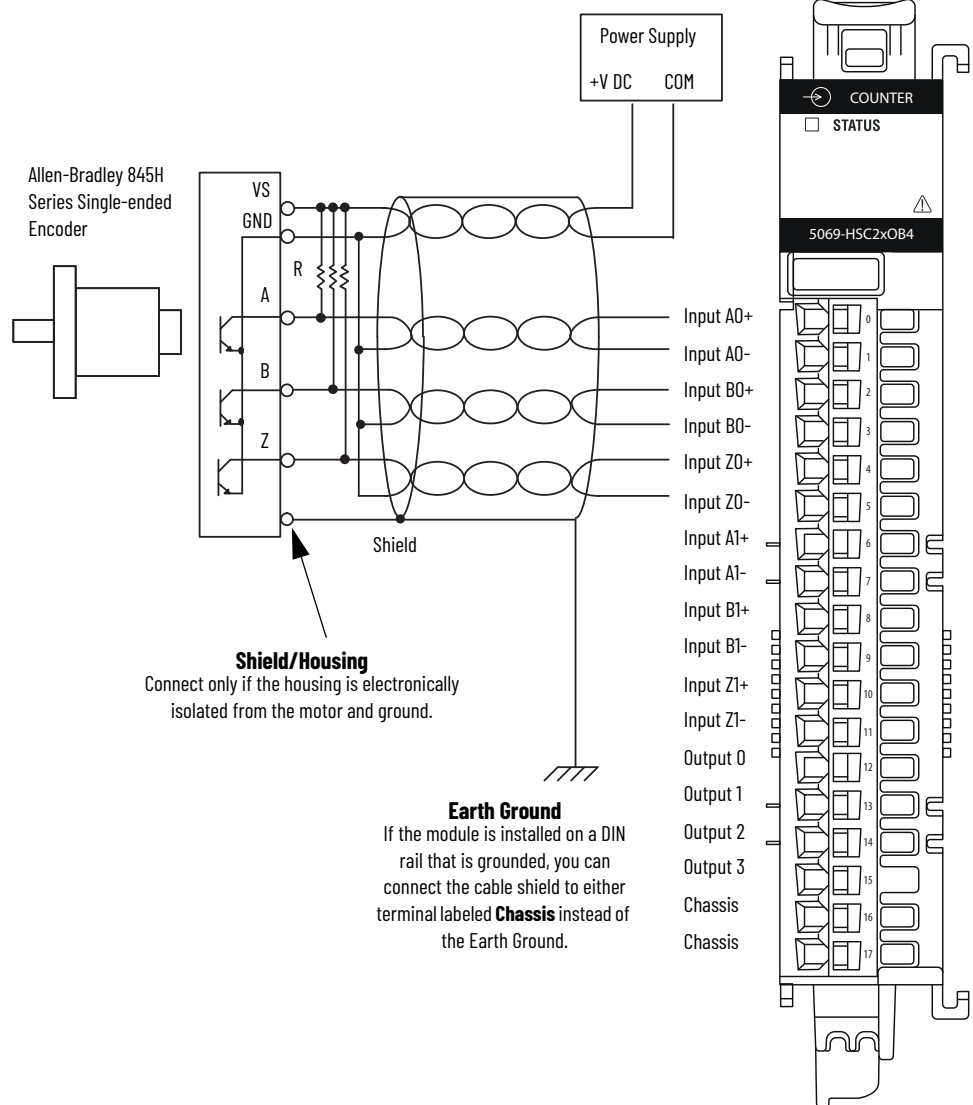
**IMPORTANT:** External resistors, as indicated in the **R** location, are required if they are not internal to the encoder. The pull-up resistor (R) value depends on the power supply value. The following table shows the maximum resistor values for typical supply voltages. To calculate the maximum resistor value, use this formula:

$$R = \frac{VDC - Vmin}{Imin}$$

Where:  
 R = Maximum pull-up resistor value  
 VDC = Power supply voltage  
 Vmin = 3.0V DC  
 Imin = 4.0 mA

Power Supply Voltage (V DC)	Pull-up Resistor Value (R), Max <sup>(1)</sup>
5	500 Ω
12	2250 Ω
24	5250 Ω

(1) Resistance values can change, depending on your application. The minimum resistor (R) value depends on the current sinking capability of the encoder.



The following figure shows a wiring diagram for the 5069-HSC2x0B4 module connected to a discrete input device.

### 5069-HSC2x0B4 Wiring Diagram - Discrete Input Devices

#### Channel Connections

The diagram shows connections to input channels 0 and 1. You are not restricted to using only those input channels.

You can connect to any input channel or combination of input channels as needed.

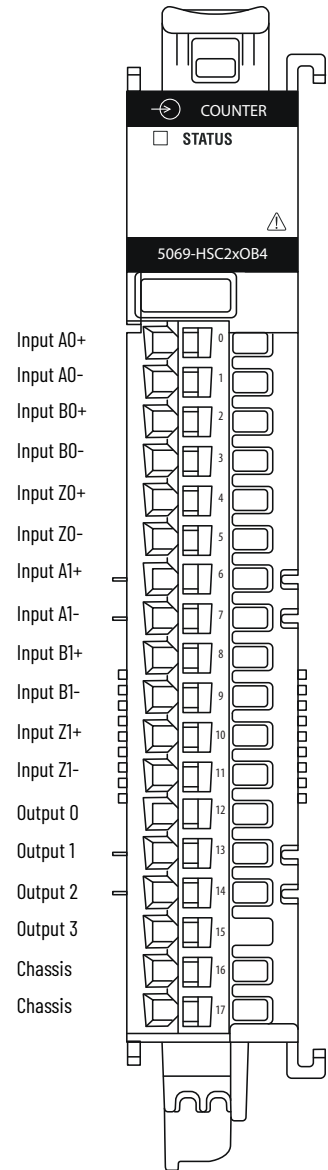
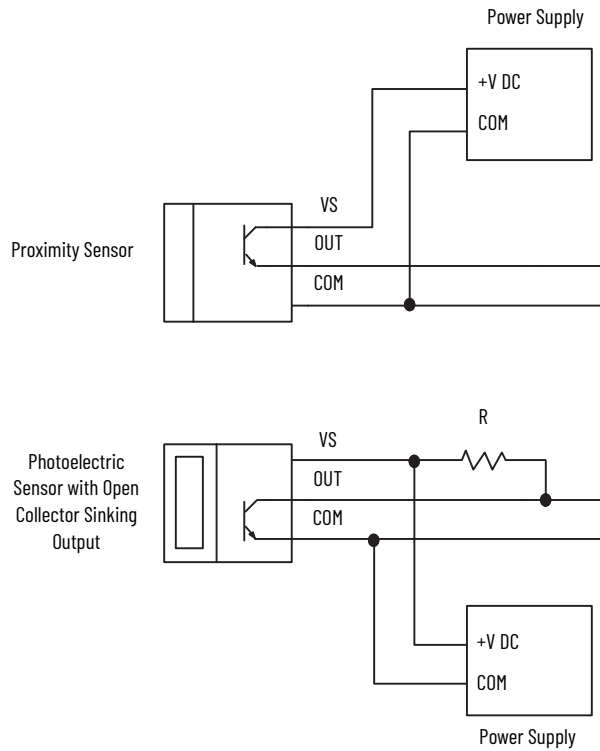
**IMPORTANT:** External resistors, as indicated in the **R** location to the left, are required if they are not internal to the encoder. The pull-up resistor (R) value depends on the power supply value. The following table shows the maximum resistor values for typical supply voltages. To calculate the maximum resistor value, use this formula:

$$R = \frac{VDC - Vmin}{Imin}$$

Where:  
 R = Maximum pull-up resistor value  
 VDC = Power supply voltage  
 Vmin = 3.0V DC  
 Imin = 4.0 mA

Power Supply Voltage (V DC)	Pull-up Resistor Value (R), Max <sup>(1)</sup>
5	500 Ω
12	2250 Ω
24	5250 Ω

(1) Resistance values can change, depending on your application. The minimum resistor (R) value depends on the current sinking capability of the encoder.



The following figure shows a wiring diagram for the 5069-HSC2xOB4 module connected to a discrete output device.

### 5069-HSC2xOB4 Wiring Diagram - Discrete Output Devices

#### Channel Connections

The diagram shows connections to output channels 0 and 2. You are not restricted to using only those output channels. You can connect to any output channel or combination of output channels as needed.

#### SA Power

Connections to an external power supply that provides SA power via the SA Power RTB on one of the following:

- CompactLogix 5380 controller
- Compact GuardLogix 5380 controller
- CompactLogix 5480 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

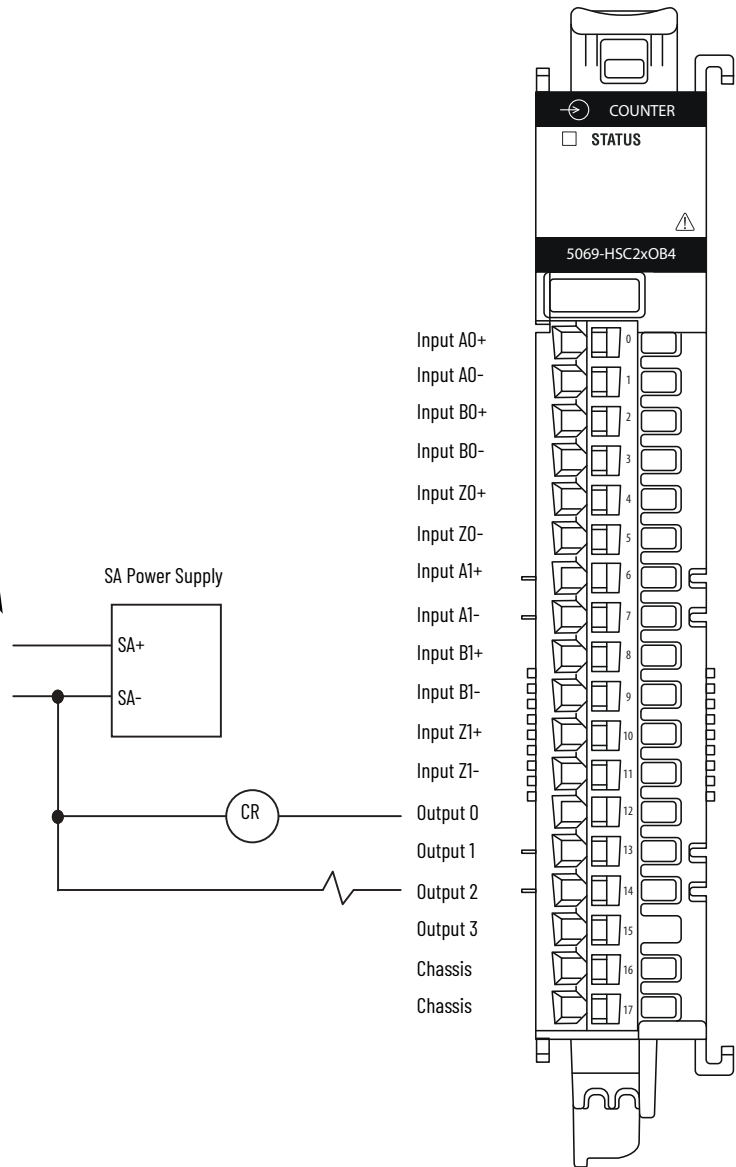
**IMPORTANT:** Remember the following:

- The 5069-HSC2xOB4 module uses DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the module.
- The 5069-HSC2xOB4 module outputs use a shared common. The outputs have a return through internal module circuitry to the SA (-) terminal on the SA Power RTB.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.

#### Recommended Surge Suppression

The module has built-in suppression that is sufficient for most applications. For high-noise applications, we recommend that you use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V DC inductive loads.

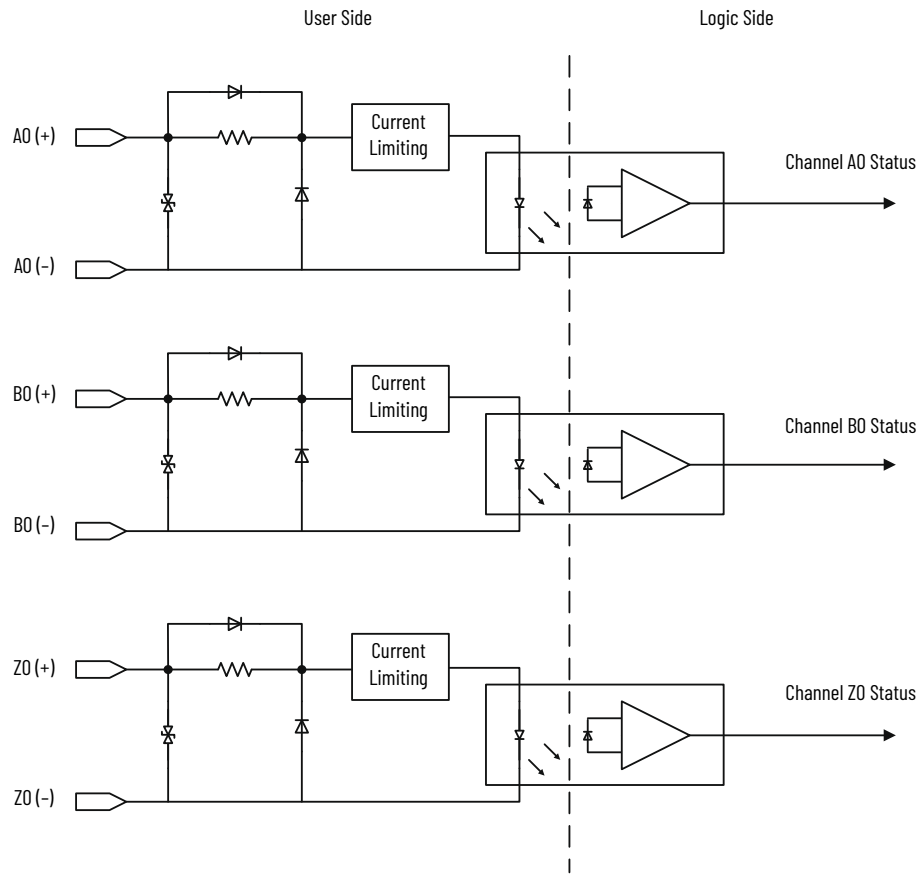
For additional details, see the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).





The following figure shows functional block diagrams for the 5069-HSC2xOB4 module inputs and outputs.

**5069-HSC2xOB4 Functional Block Diagram**

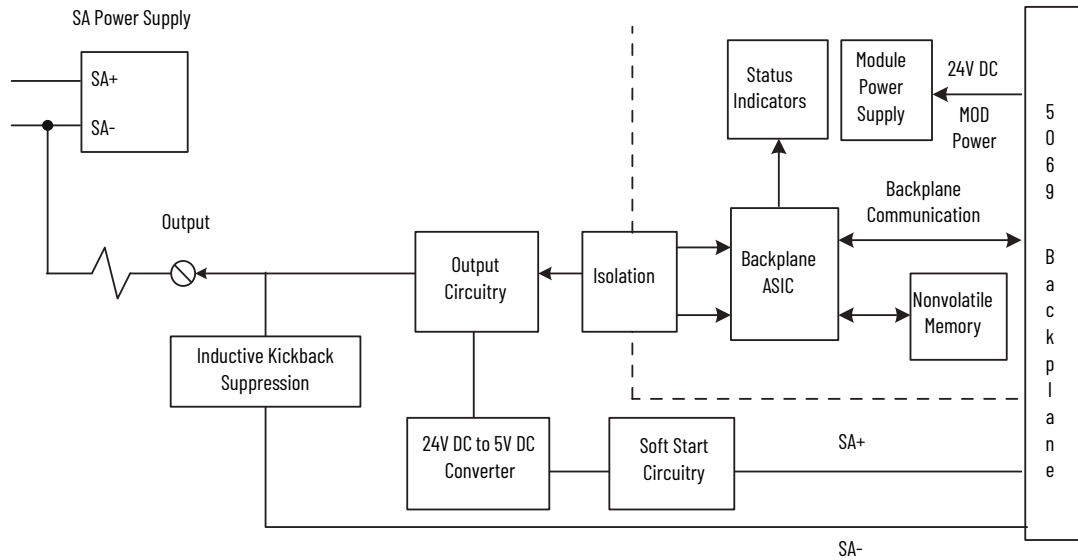


**Module Inputs**

This graphic shows the diagram for Counter 0. Counter 1 uses the same design. Also, the modules only supports a DC power source.

**Module Outputs**

Connections to external power supply that provides SA Power. For more information, see [page 104](#).



**Technical Specifications - 5069-HSC2x0B4**

<b>Attribute</b>	<b>5069-HSC2x0B4</b>
Input current, max	8 mA
On-state voltage, min	3V DC
On-state voltage, nom	24V DC
On-state voltage, max	32V DC
On-state voltage drop, max	< 0.3V DC
On-state current, min	4 mA
Off-state voltage, max	1.5V
Off-state current, max	1 mA
Output voltage range	10...32V DC
On-state output current, min	1 mA per channel 4 mA per module
Pulse width, min	125 ns
Pulse separation, min	100 ns
No load detection diagnostics	Yes (per channel diagnostics)
Output short circuit/overload/overtemp detection	Yes (per channel diagnostics)
Output short circuit/overload protection	Yes
Reverse voltage protection	32V DC
Overvoltage protection, max	36V (fuse protected)
Pilot duty	Yes (Make current electronically limited/protected @ 3.6 A)
Output control in fault state per point	<ul style="list-style-type: none"> <li>• Hold last state</li> <li>• On</li> <li>• Off (default)</li> </ul>
Output states in program mode per point	<ul style="list-style-type: none"> <li>• Hold last state</li> <li>• On</li> <li>• Off (default)</li> </ul>
Output states in fault mode per point	<ul style="list-style-type: none"> <li>• Hold Last State</li> <li>• On</li> <li>• Off (default)</li> </ul>
Duration of fault mode per point	<ul style="list-style-type: none"> <li>• 1 s</li> <li>• 2 s</li> <li>• 5 s</li> <li>• 10 s</li> <li>• Forever (default)</li> </ul>

## General Specifications - 5069-HSC2x0B4

Attribute	5069-HSC2x0B4
Inputs	2 quadrature (ABZ) differential inputs
Outputs	4 Channels (1 group of 4), sourcing
Voltage category	12/24V DC source
Voltage and current ratings	
Counter input ratings	4 mA @ 3...32V DC
MOD Power	50 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power	3 A @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 10...32V DC
Do not exceed 10 A MOD or SA Power (Passthrough) current draw	
Power dissipation, max	3 W
Thermal dissipation, max	10.2 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type No isolation between SA Power and I/O ports No isolation between individual I/O ports Type tested at 1500V AC for 60 s
Module keying	Electronic keying via programming software
Indicators	1 green/red module status indicator 10 yellow/red I/O status indicator
Slot width	1
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. • You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	One of these RTB types. • 5069-RTB18-SPRING RTB • 5069-RTB18-SCREW RTB <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.
RTB keying	None
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N•m (3.5 lb•in)
Wiring category <sup>(3)</sup>	2 - on shielded output ports 2 - on output power ports 2 - on shielded counter ports
Wire size	
5069-RTB18-SPRING connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation
5069-RTB18-SCREW connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation
Insulation stripping length	
5069-RTB18-SPRING connections	10 mm (0.39 in.)
5069-RTB18-SCREW connections	12 mm (0.47 in.)
Weight, approx	175 g (0.39 lb)
Enclosure type	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEX temp code	T4

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-HSC2x0B4**

<b>Attribute</b>	<b>5069-HSC2x0B4</b>
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95 % noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on shielded output ports ±2 kV @ 5 kHz on shielded counter ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±2 kV line-earth (CM) on shielded output ports ±2 kV line-earth (CM) on shielded counter ports
Conducted RF immunity IEC 61000-4-6	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Voltage variation IEC 61000-4-29:	10 ms interruption on MOD Power port

## Certifications - 5069-HSC2x0B4

Certification <sup>(1)</sup>	5069-HSC2x0B4
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1455X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0007X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-SERIAL Serial Module

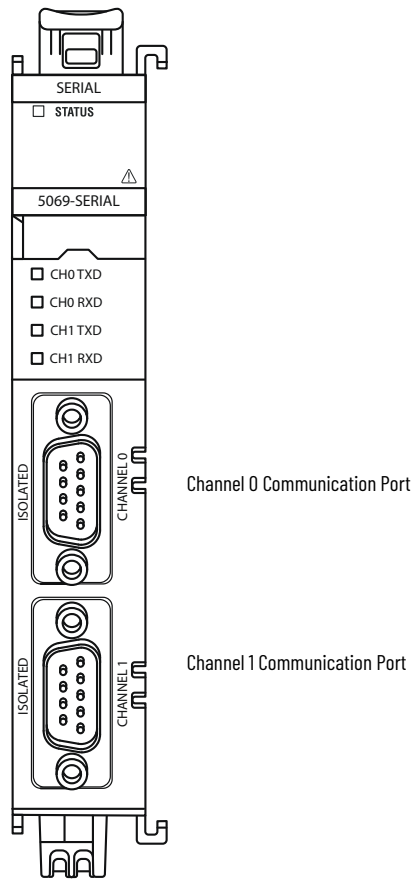
The Compact 5000 I/O serial module provides a network interface to RS-232, RS-422, and RS-485 devices. The following figure shows the 5069-SERIAL serial module.

### SA Power

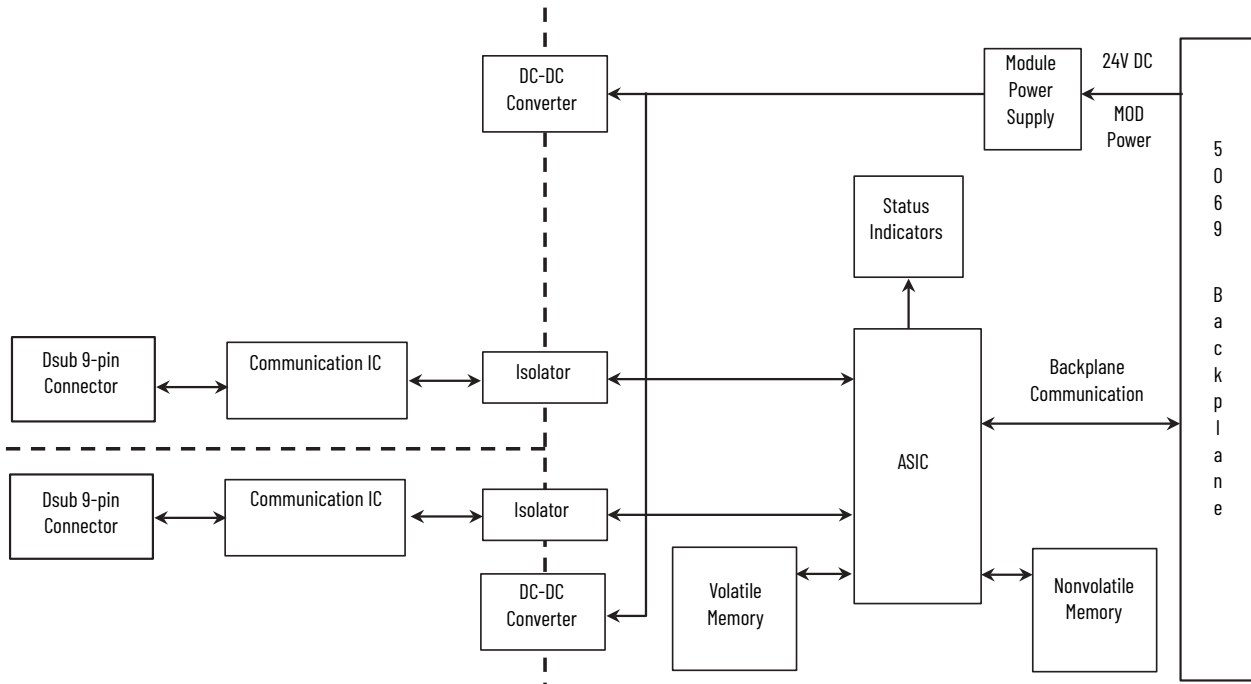
The 5069-SERIAL module **does not draw current from the SA power bus.**

Still, the module is a DC-type module, and you must install it on a DC SA Power bus.

- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA Power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
  1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
  2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
  3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.

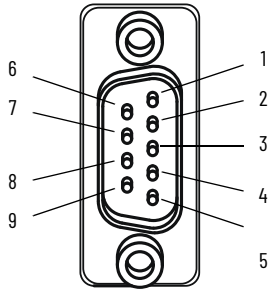


### 5069-SERIAL Functional Block Diagram



## RS-232 Wiring Examples

### Pins - RS-232C



Pin	RS-232C	Input (i)/Output (o) <sup>(1)</sup>	Wiring	
			No Handshaking	Handshaking
1	Data Carrier Detect (DCD)	(i)	-	-
2	Receive Data (RXD)	(i)	A <sup>(2)</sup>	A
3	Transmit Data (TXD)	(o)	A	A
4	Data Terminal Ready (DTR)	(o)	B <sup>(3)</sup>	B
5	Common (COM)	-	A	A
6	Data Set Ready (DSR)	(i)	-	-
7	Request To Send (RTS)	(o)	B	A
8	Clear To Send (CTS)	(i)	-	A
9	-	-	-	-

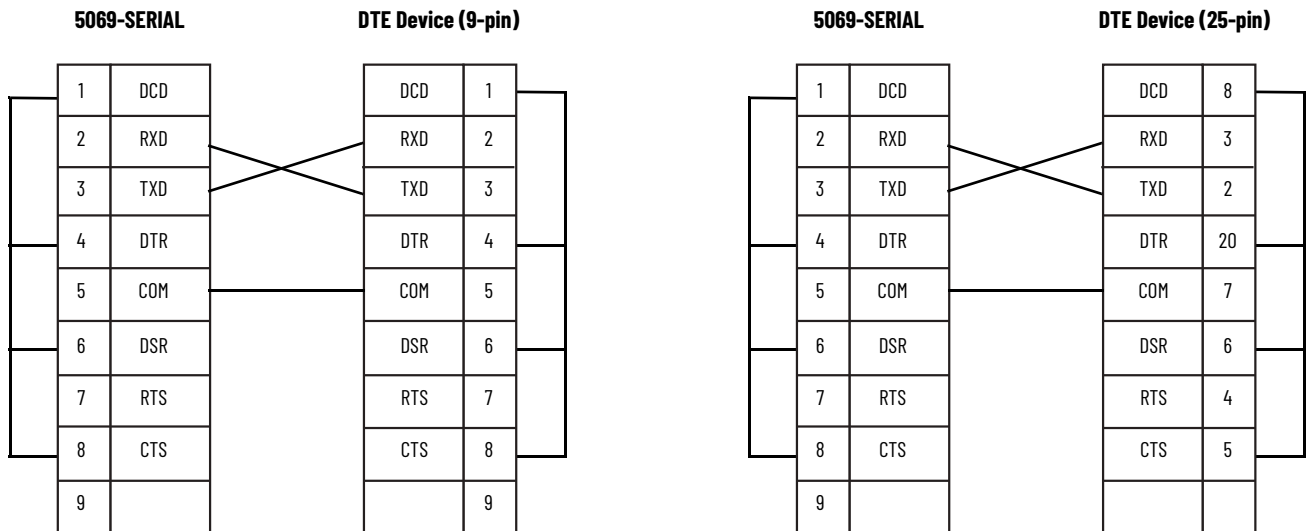
(1) From 5069-SERIAL

(2) A = Changing signal level (Active/Inactive)

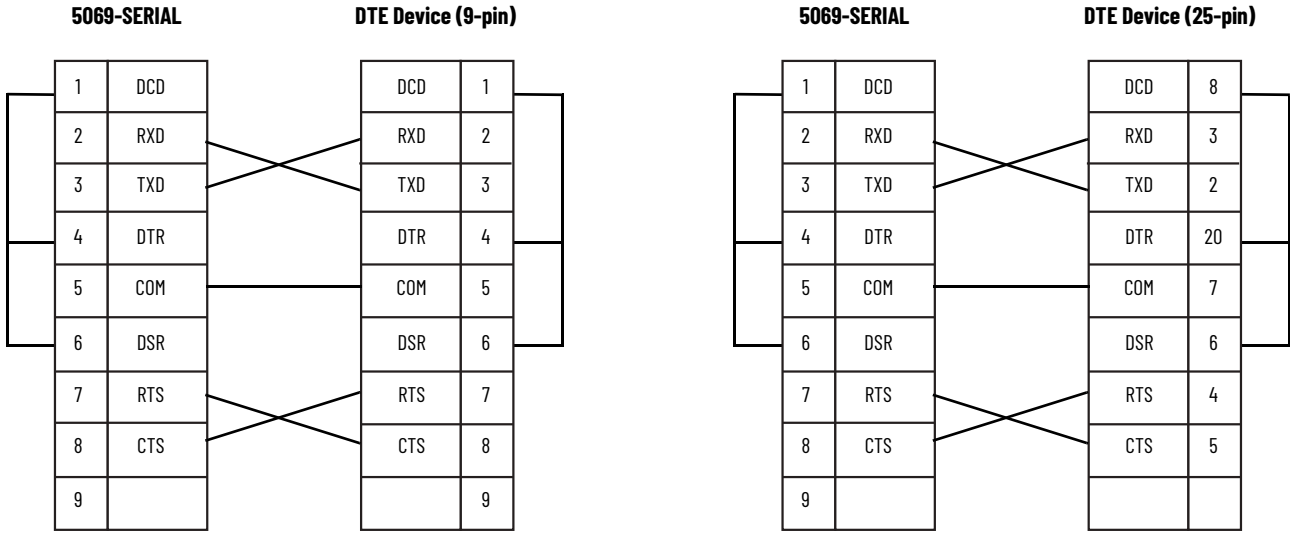
(3) B = Fixing signal level (Active/Inactive)

The following graphics show RS-232 wiring.

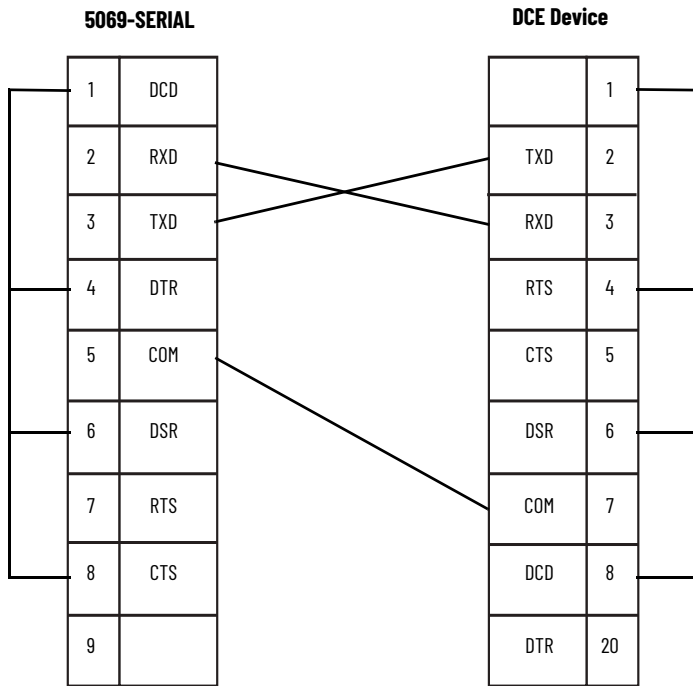
### 5069-SERIAL to DTE Device (9-pin or 25-pin) without Hardware Handshaking



**5069-SERIAL to DTE Device (9-pin or 25-pin) with "Half-duplex"**

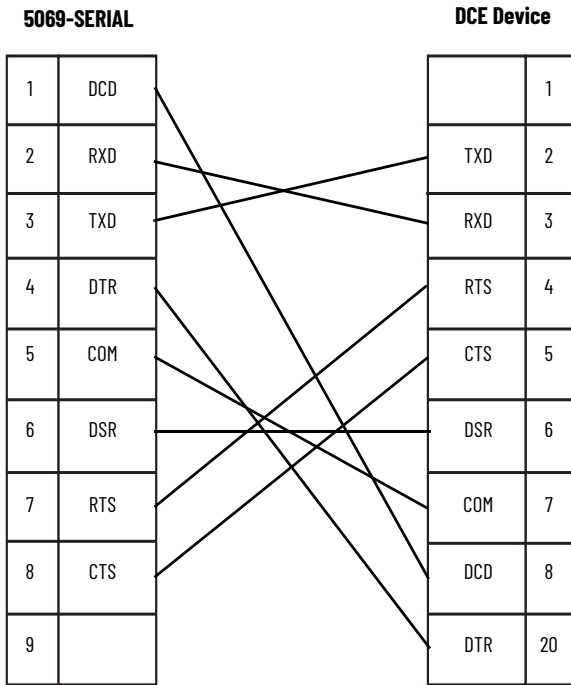


**5069-SERIAL to DCE Device with "Full-duplex"**

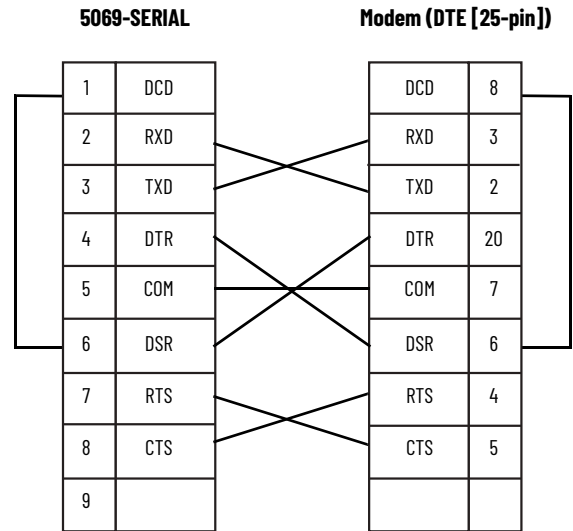
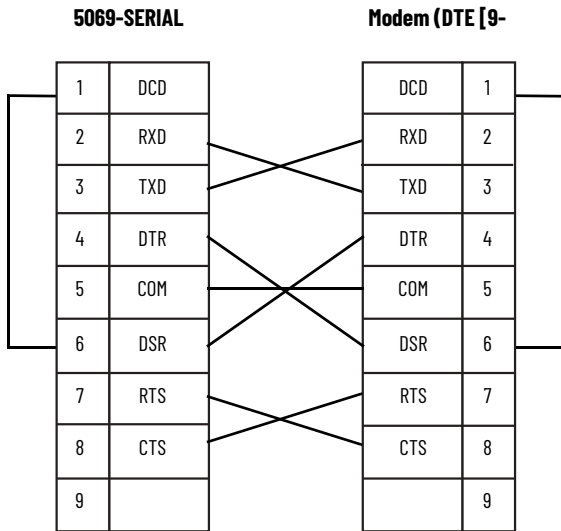




**5069-SERIAL to DCE Device (Modem) with "Full or Half-duplex"**

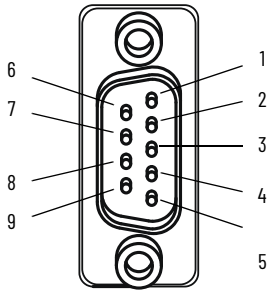


**5069-SERIAL to DTE Device (9-pin or 25-pin) with "Full or Half-duplex" or Null Modem**



## RS-422 Wiring Example

### Pins - RS-422



Pin	RS-422	Input (i)/Output (o) <sup>(1)</sup>	Wiring
1	-	-	-
2	Receive Data + (RXD+)	(i)	A <sup>(2)</sup>
3	Transmit Data + (TXD+)	(o)	A
4	-	-	B
5	Common (COM)	-	A
6	-	-	-
7	Transmit Data - (TXD-)	(o)	A
8	Receive Data - (RXD-)	(i)	A
9	-	-	-

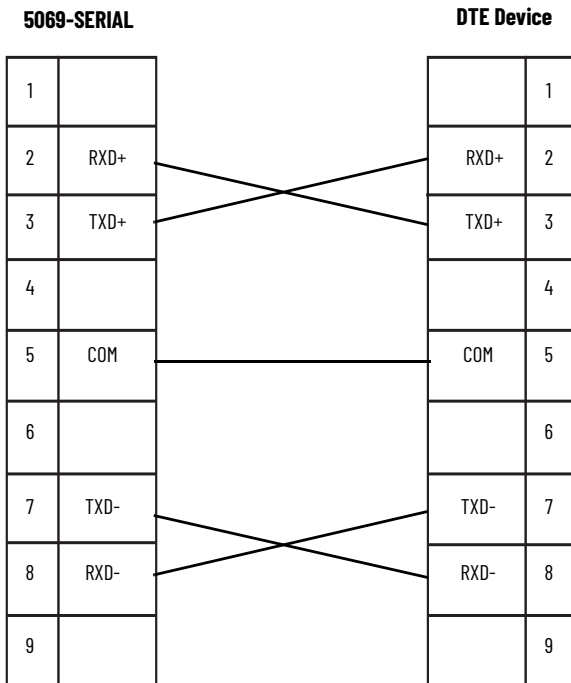
(1) From 5069-SERIAL

(2) A = Changing signal level (Active/Inactive)

The following graphic shows RS-422 wiring.

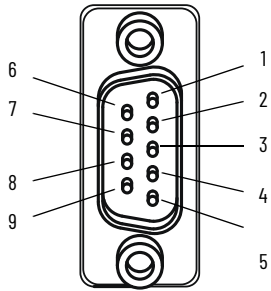
### 5069-SERIAL RS-422 Wiring

**IMPORTANT** Place the termination resistor between RxD+ and RxD- to implement this wiring.



## RS-485 Wiring Example

### Pins - RS-485



Pin	RS-485	Input (i)/Output (o) <sup>(1)</sup>	Wiring
1	-	-	-
2	-	-	-
3	Transmit/Receive Data + (TRXD+)	(i/o)	A <sup>(2)</sup>
4	-	-	-
5	Common (COM)	-	A
6	-	-	-
7	Transmit/Receive Data - (TRXD-)	(i/o)	A
8	-	-	-
9	-	-	-

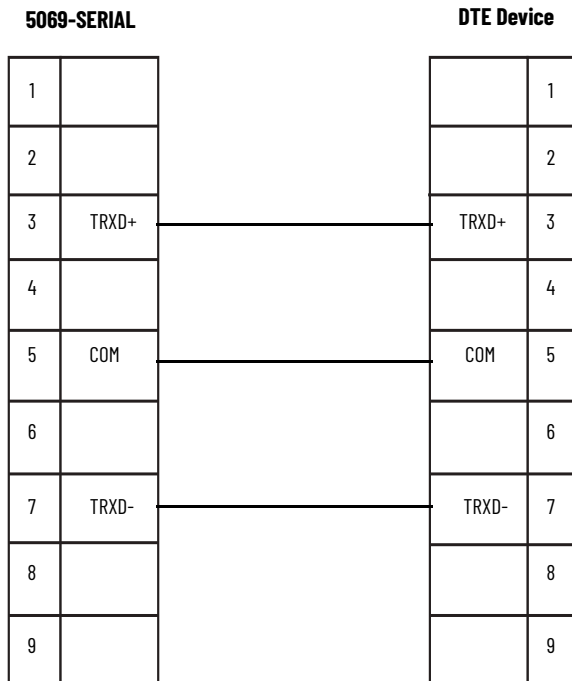
(1) From 5069-SERIAL

(2) A = Changing signal level (Active/Inactive)

The following graphic shows RS-485 wiring.

### 5069-SERIAL RS-485 Wiring

**IMPORTANT** Place the termination resistor between TRXD+ and TRXD- to implement this wiring.



## Technical Specifications - 5069-SERIAL

Attribute	5069-SERIAL
Operating modes	<ul style="list-style-type: none"> <li>Generic ASCII</li> <li>Modbus RTU</li> <li>Modbus ASCII</li> <li>DF1 (local Channel 1 only)</li> <li>DH485 (local Channel 1 only)</li> </ul>
Inputs	<ul style="list-style-type: none"> <li>2 full-duplex (RS-232, RS-422)</li> <li>2 half-duplex (RS-485)</li> </ul>
Serial input voltage signal	<ul style="list-style-type: none"> <li>3...25V DC regarding signal ground (SG) 0, Asserted, ON, Space, Active</li> <li>-3...-25V DC regarding signal ground (SG) 1, Disasserted, OFF, Mark, Inactive</li> </ul>
Voltage and current ratings	
MOD Power	100 mA @ 18...32V DC
MOD Power Passthrough, max	9.55 A @ 18...32V DC <sup>(1)</sup>
SA Power Passthrough, max The module does not draw SA Power current.	9.95 A @ 0...32V DC <sup>(2)</sup>
Do not exceed 10 A MOD or SA Power (Passthrough) current draw	
Power dissipation, max	2.8 W
Thermal dissipation, max	9.6 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type, SA and MOD Power to Backplane 250V (continuous), Basic Insulation Type, Backplane to Communication Channels 250V (continuous), Basic Insulation Type, Backplane to Chassis Ground 250V (continuous), Basic Insulation Type, Between Communication Channels 250V (continuous), Basic Insulation Type, SA to MOD Power 250V (continuous), Basic Insulation Type, Communication Channels to Chassis Ground 250V (continuous), Basic Insulation Type, SA and MOD Power to Chassis Ground 250V (continuous), Reinforced Insulation Type, SA and MOD Power to Communication Channels Basic Insulation Type tested at 2100V DC for 60 s Reinforced Insulation Type tested at 4200V DC for 60 s
Transmit transaction ID	0...255
Handshaking	RTS/CTS hardware handshake always enabled. RTS/CTS can be controlled by the user.
Module keying	None
Indicators	1 green/red module status indicator 1 transmit data (TXD) and 1 receive data (RXD) yellow/red status indicator per channel
Slot width	1
Dimensions (HxWxD), approx	137.85 x 22 x 105.42 mm (5.43 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB keying	None
Serial port connectors	Two DB-9 male with pins
Wire category <sup>(3), (4)</sup>	2 - power ports 2 - communication ports
Weight, approx	175 g (0.39 lb.)
Enclosure type	None (open-style)
Corrosion resistance classification	ISA S71.04 G2
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(4) Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual.

**Environmental Specifications - 5069-SERIAL**

<b>Attribute</b>	<b>5069-SERIAL</b>
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold) IEC 60068-2-2 (Test Bd, Operating Dry Heat) IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < 60 °C (32 °F < Ta < 140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold) IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat) IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on communication ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±2 kV line-earth (CM) on communication ports
Conducted RF immunity IEC 61000-4-6	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

**Certifications - 5069-SERIAL**

<b>Certifications<sup>(1)</sup></b>	<b>5069-SERIAL</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> <li>EN 61000-6-4; Industrial Emissions</li> </ul>
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4X Gc</li> <li>DEMKO15ATEX1484X</li> </ul>

**Certifications - 5069-SERIAL**

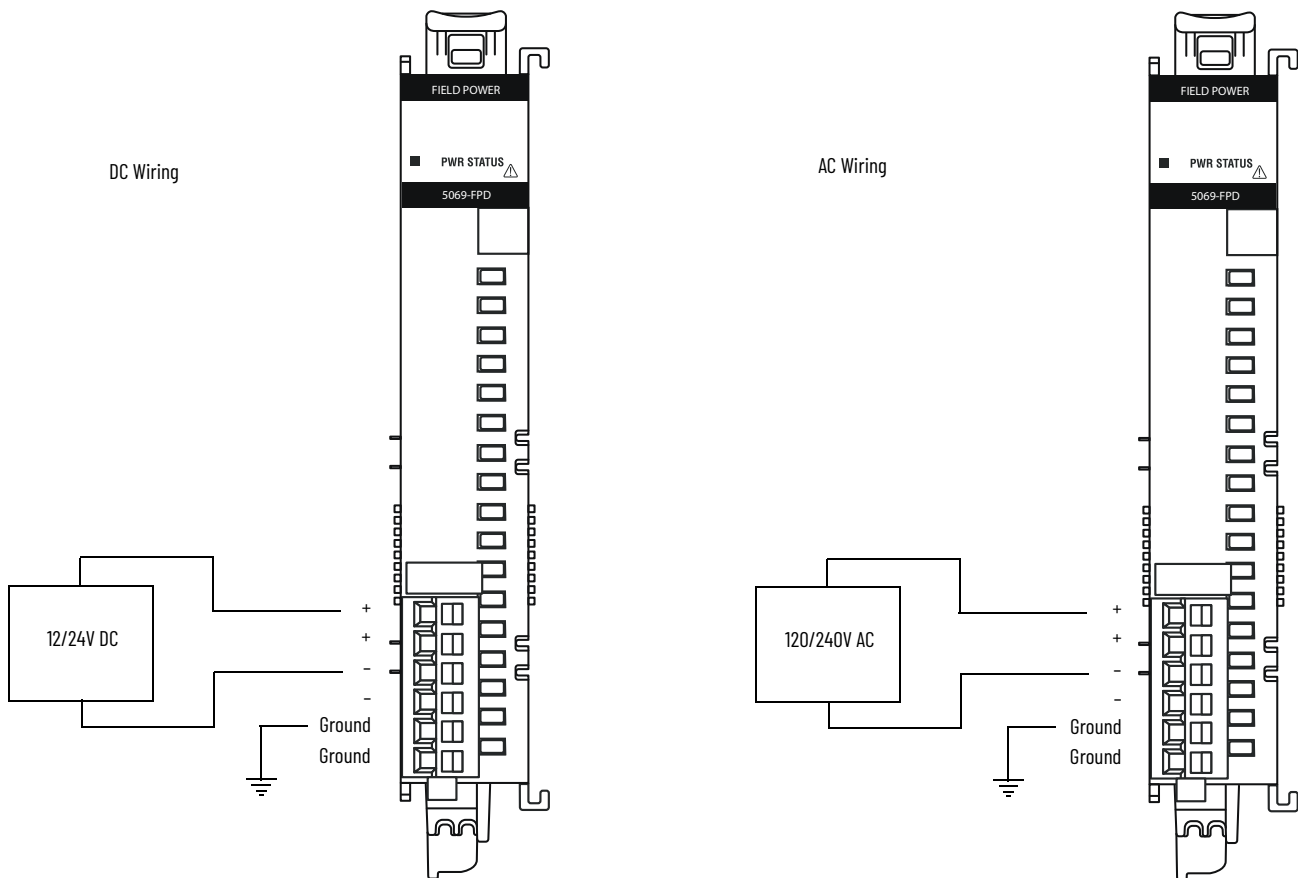
Certifications <sup>(1)</sup>	5069-SERIAL
IECEX	IECEx System, compliant with: <ul style="list-style-type: none"> <li>• IEC 60079-0; General Requirements</li> <li>• IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• II 3 G Ex nA IIC T4X Gc</li> <li>• IECEx UL 15.0055X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> <li>• Article 58-2 of Radio Waves Act, Clause 3</li> </ul>
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

**5069-FPD Field Potential Distributor**

The following figure shows wiring diagrams for the 5069-FPD field potential distributor connected to a discrete input device.

**5069-FPD Wiring Diagrams**



## Technical Specifications - 5069-FPD

Attribute	5069-FPD
Voltage and current ratings	
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power	10 mA @ 0...32V DC 25 mA @ 0...240V AC, 47...63 Hz ATEX/IECEX, 125V AC, max
SA Power Passthrough, max <sup>(2)</sup>	9.99 A @ 0...32V DC 9.975 A @ 0...240V AC, 47...63 Hz ATEX/IECEX, 125V AC, max
Do not exceed 10 A MOD or SA Power (Passthrough) current draw	
Power dissipation, max	4.0 W
Thermal dissipation, max	13.6 BTU/hr
Isolation voltage	250V (continuous), Basic Insulation Type Type tested at 1500V AC for 60 s
Module keying	None
Indicators	1 green module status indicator
Slot width	1
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
RTB	5069-RTB6-SCREW 5069-RTB6-SPRING
RTB torque (5069-RTB4-SCREW RTB only)	0.4 N•m (3.5 in•lb)
RTB keying	None
Wire category <sup>(3)</sup>	2 - on power ports
Wire size	
5069-RTB6-SPRING connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation, single wire connection only.
5069-RTB6-SCREW connections	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation, single wire connection only.
Insulation stripping length	
5069-RTB6-SPRING connections	10 mm (0.039 in.)
5069-RTB6-SCREW connections	12 mm (0.47 in.)
Weight, approx	175 g (0.39 lb)
Enclosure type	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEX temp code	T4

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Environmental Specifications - 5069-FPD**

<b>Attribute</b>	<b>5069-FPD</b>
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports
Conducted RF immunity IEC 61000-4-6	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz



## Certifications - 5069-FPD

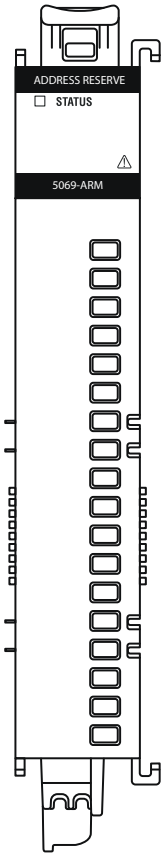
Certifications <sup>(1)</sup>	5069-FPD
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>• EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>• EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-0; General Requirements</li> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• II 3 G Ex nA IIC T4 Gc</li> <li>• DEMKO 15 ATEX 1455X When used at or below 125V AC</li> </ul>
IECEx	IECEx System, compliant with: <ul style="list-style-type: none"> <li>• IEC 60079-0; General Requirements</li> <li>• IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• II 3 G Ex nA IIC T4 Gc</li> <li>• IECEx UL 15.0007X When used at or below 125V AC</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-ARM Address Reserve Module

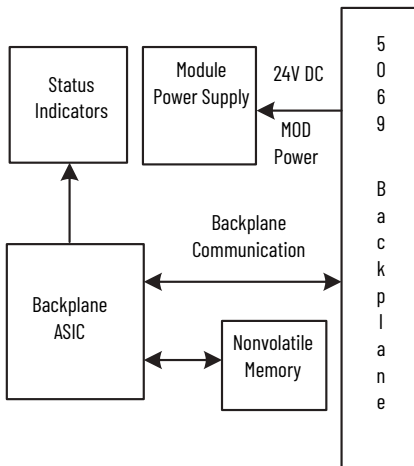
The following figure shows the 5069-ARM module.

### 5069-ARM Module



The following figure shows a functional block diagram for the 5069-ARM module.

### 5069-ARM Functional Block Diagram



**Technical Specifications - 5069-ARM**

Attribute	5069-ARM
Voltage and current ratings	
MOD Power	45 mA @ 18...32V DC
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power Passthrough, max <sup>(2)</sup> The module does not draw SA Power current.	9.95 A @ 0...32V DC 9.975 A @ 0...240V AC, 47...63 Hz ATEX/IECEX, 125V AC, max
Do not exceed 10 A MOD or SA Power (Passthrough) current draw	
Power dissipation, max	1.0 W
Thermal dissipation, max	3.4 BTU/hr
Module keying	None
Indicators	1 green/red module status indicator
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.
Weight, approx	175 g (0.39 lb)
Enclosure type	None (open-style)
North American temp code	T4
ATEX temp code	T4
IECEX temp code	T4

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, [5069-UM001](#), CompactLogix 5480 Controllers User Manual, [5069-UM002](#), and Compact 5000 EtherNet/IP Adapters User Manual, [5069-UM004](#).

**Environmental Specifications - 5069-ARM**

Attribute	5069-ARM
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock):	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock):	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat):	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating):	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock):	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock):	50 g
Emissions	IEC 61000-6-4

**Environmental Specifications - 5069-ARM**

<b>Attribute</b>	<b>5069-ARM</b>
ESD immunity IEC61000-4-2:	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
Voltage variation IEC 61000-4-29:	10 ms interruption on DC supply ports

**Certifications - 5069-ARM**

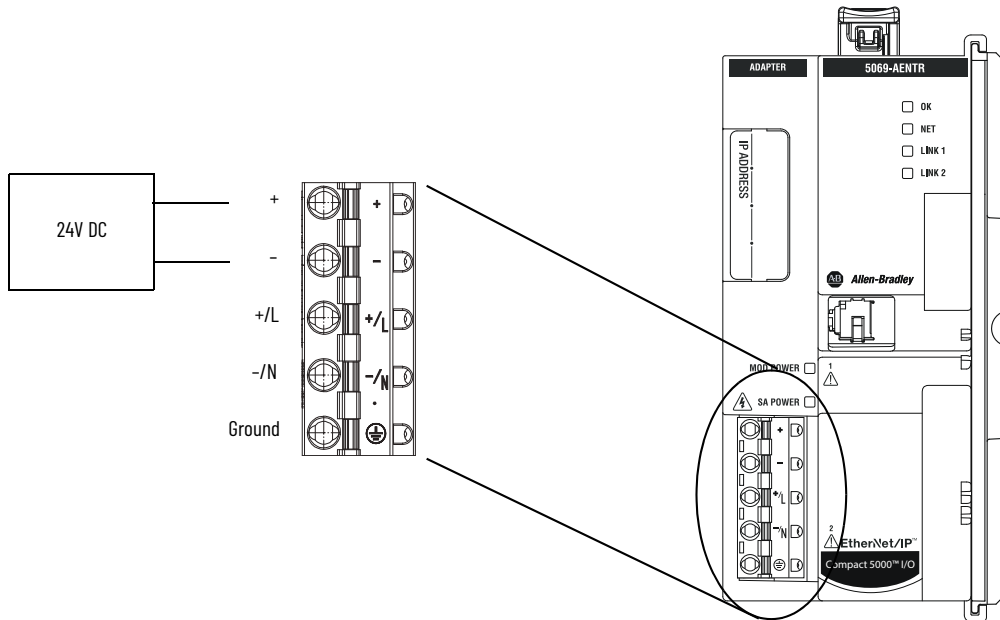
<b>Certifications<sup>(1)</sup></b>	<b>5069-ARM</b>
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-0; General Requirements</li> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1455X</li> </ul> When used at or below 125V AC
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-0; General Requirements</li> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0007X</li> </ul> When used at or below 125V AC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-AENTR and 5069-AENTRK EtherNet/IP Adapters

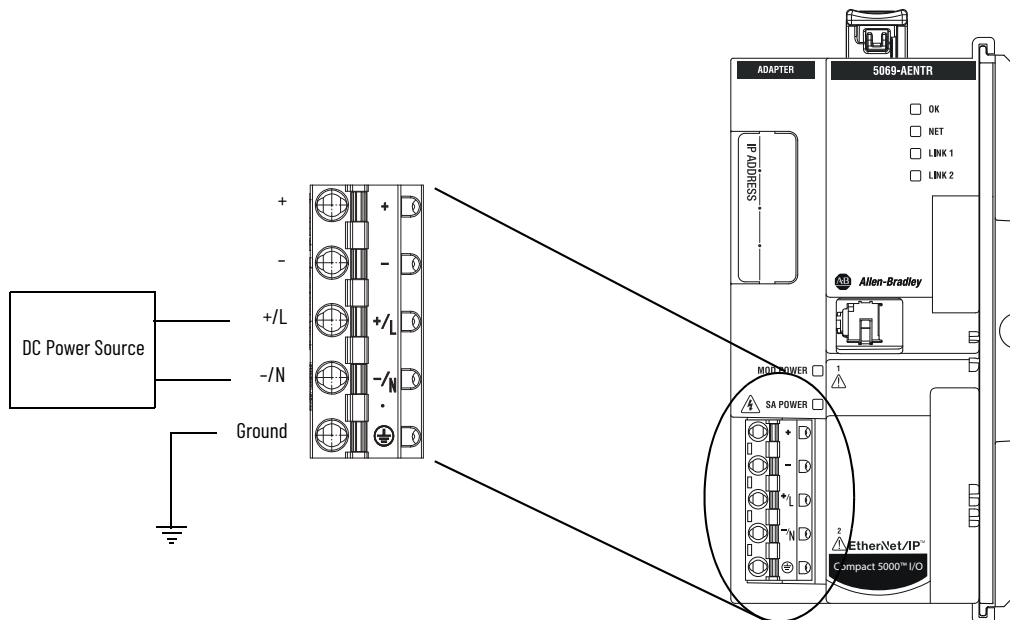
The following figure shows a wiring diagram for how to connect MOD power to the 5069-AENTR and 5069-AENTRK EtherNet/IP™ adapters.

### 5069-AENTR and 5069-AENTRK Wiring Diagram - MOD Power (DC)



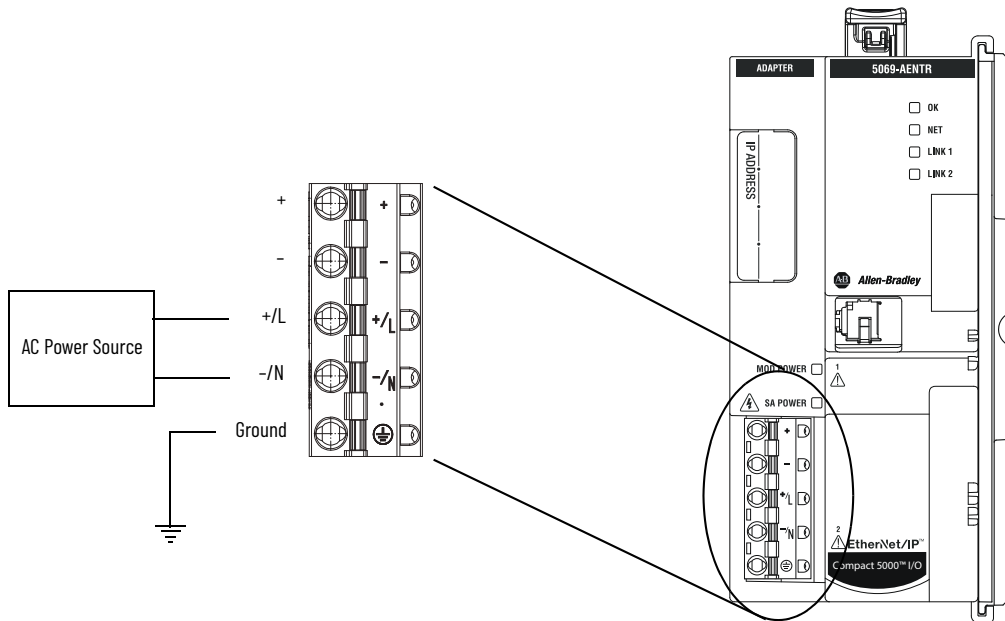
The following figure shows a wiring diagram for how to connect SA power (DC) to the 5069-AENTR and 5069-AENTRK EtherNet/IP adapters.

### 5069-AENTR and 5069-AENTRK Wiring Diagram - SA Power (DC)



The following figure shows a wiring diagram for how to connect SA power (AC) to the 5069-AENTR and 5069-AENTRK EtherNet/IP adapters.

### 5069-AENTR and 5069-AENTRK - Wiring Diagram - SA Power (AC)



### Technical Specifications - 5069-AENTR and 5069-AENTRK

Attribute	5069-AENTR, 5069-AENTRK
Enclosure type rating	None (open-style)
Voltage and current ratings	
MOD Power	220 mA @ 18...32V DC
MOD Power inrush	1750 mA for 70 ms
MOD Power Passthrough, max <sup>(1)</sup>	9.78 A @ 18...32V DC
SA Power	5 mA @ 0...32V DC 2 mA @ 0...240V AC, 47...63 Hz ATEX/IECEX, 125V AC Max
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 0...32V DC 9.975 A @ 0...240V AC, 47...63 Hz ATEX/IECEX, 125V AC Max
Do not exceed 10 A current draw at the MOD or SA Power RTB.	
Recommended external overcurrent protection	MOD Power: 10...12A @ 22.5...43.2 A2t, Fast Acting SA Power: 20 A @ 250V AC
Power dissipation, max	8.5 W
Thermal dissipation, max	29 BTU/hr

## Technical Specifications - 5069-AENTR and 5069-AENTRK

Attribute	5069-AENTR, 5069-AENTRK
Isolation voltage	250V (continuous), Basic Insulation Type, SA, and MOD Power to Backplane 250V (continuous), Basic Insulation Type, SA to MOD Power 250V (continuous), Basic Insulation Type, Ethernet to Backplane Type tested at 1500V AC for 60 s 250V (continuous), Double Insulation Type, Ethernet to MOD Power 250V (continuous), Double Insulation Type, Ethernet to SA Power Type tested at 4242V DC for 60 s No isolation between Ethernet ports
Module keying	Electronic keying via programming software
Dimensions (HxWxD), approx	138 x 56 x 105 mm (5.43 x 2.20 x 4.15 in.)
RTB	We recommend that you order only the RTB type that your system requires. RTBs are available in separately ordered 5069 RTB kits. The following kits are available: <ul style="list-style-type: none"> <li>Kit catalog number 5069-RTB5-SCREW kit contains two 5069-RTB5-SCREW RTBs.</li> <li>Kit catalog number 5069-RTB5-SPRING kit contains two 5069-RTB5-SPRING RTBs.</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O EtherNet/IP adapters. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB5-SCREW RTB only)	0.5...0.6 N•m (4.4...5.3 lb•in)
RTB keying	None
Wiring category <sup>(3), (4)</sup>	2 - on signal ports 1 - on power ports 2 - on Ethernet ports
Wire size	0.25...2.5 mm <sup>2</sup> (22...14 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation m, single wire connection only. Grounding: 2.5 mm <sup>2</sup> (14 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5mm (0.14in) max diameter including insulation, single wire connection only. Ethernet connections: Ethernet Cabling and Installation according to IEC 61918 and IEC 61784-5-2.
Insulation stripping length	
5069-RTB5-SPRING connections	10 mm (0.39 in.)
5069-RTB5-SCREW connections	10 mm (0.39 in.)
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

(1) Maximum level of MOD Power current that the adapter can pass through to the next module in the system.

(2) Maximum level of SA Power current that the adapter can pass through to the next module in the system.

(3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

(4) Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual.

**Environmental Specifications - 5069-AENTR, 5069-AENTRK**

<b>Attribute</b>	<b>5069-AENTR, 5069-AENTRK</b>
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11/22, Class A
ESD immunity IEC61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±3 kV @ 5 kHz on power ports ±3 kV @ 5 kHz on Ethernet ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±2 kV line-earth (CM) on Ethernet ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on power and Ethernet ports



## Certifications - 5069-AENTR and 5069-AENTRK

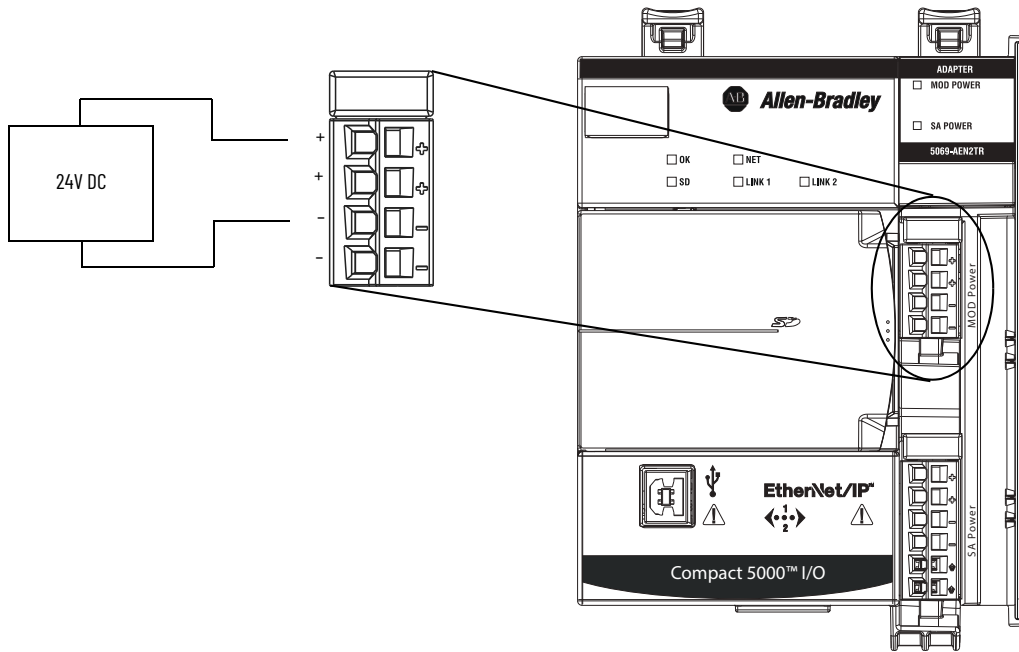
Certifications <sup>(1)</sup>	5069-AENTR, 5069-AENTRK
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>• EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>• EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements</li> <li>• II 3 G Ex nA IIC T4 Gc</li> <li>• DEMKO 16 ATEX 1758X</li> </ul>
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>• IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• IEC 60079-0; General Requirements</li> <li>• II 3 G Ex nA IIC T4 Gc</li> <li>• IECEX UL 16.0124X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation
EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-AEN2TR EtherNet/IP Adapter

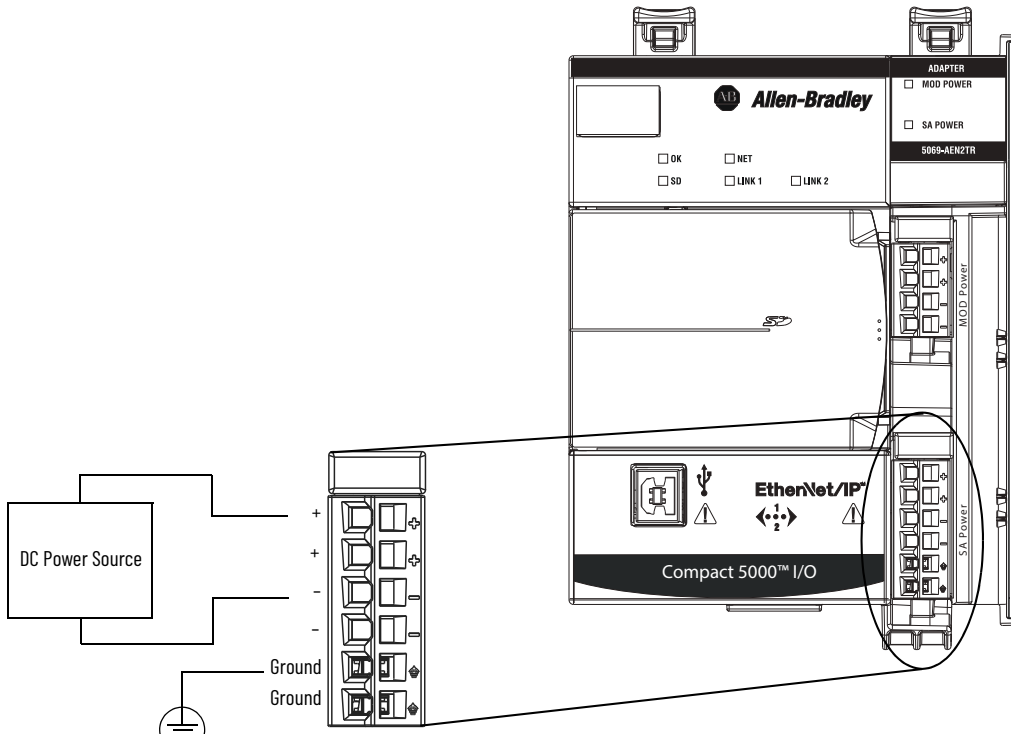
The following figure shows a wiring diagram for how to connect MOD power to the 5069-AEN2TR EtherNet/IP adapter.

### 5069-AEN2TR Wiring Diagram - MOD Power (DC)



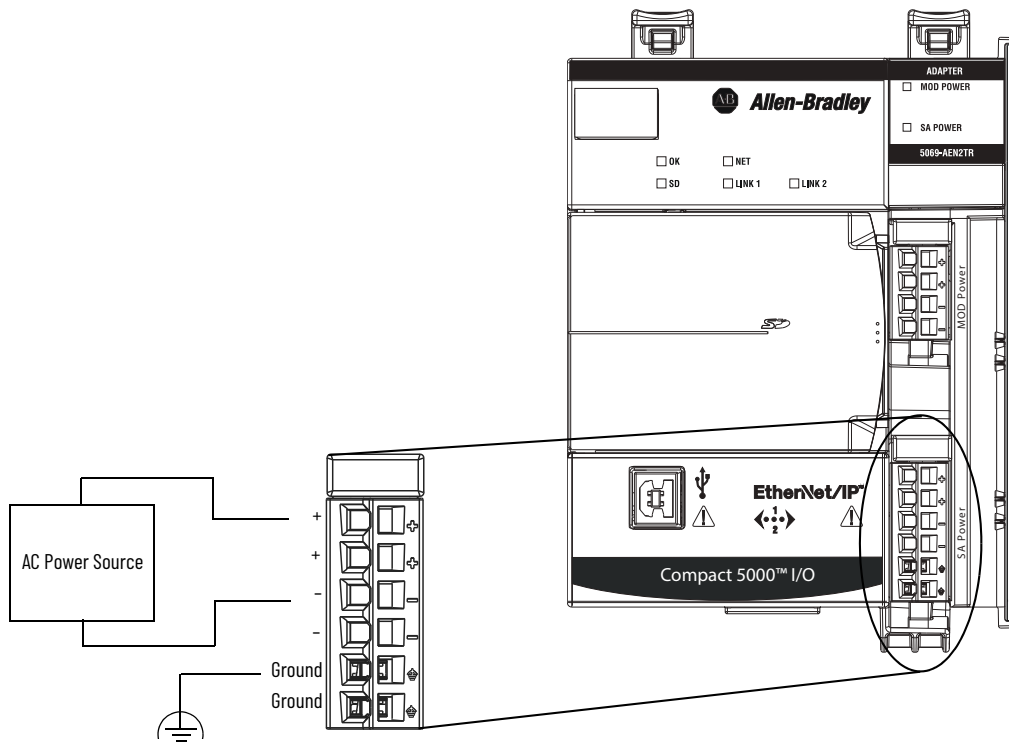
The following figure shows a wiring diagram for how to connect SA power (DC) to the 5069-AEN2TR EtherNet/IP adapter.

### 5069-AEN2TR Wiring Diagram - SA Power (DC)



The following figure shows a wiring diagram for how to connect SA power (AC) to the 5069-AEN2TR EtherNet/IP adapter.

### 5069-AEN2TR - Wiring Diagram - SA Power (AC)



### Technical Specifications

Attribute	5069-AEN2TR
Enclosure type rating	None (open-style)
Voltage and current ratings	
MOD Power	450 mA @ 18...32V DC
MOD Power inrush	850 mA for 125 ms
MOD Power Passthrough, max <sup>(1)</sup>	9.55 A @ 18...32V DC
SA Power	10 mA @ 0...32V DC 25 mA @ 0...240V AC, 47...63 Hz ATEX/IECEX, 125V AC Max
SA Power Passthrough, max <sup>(2)</sup>	9.95 A @ 0...32V DC 9.975 A @ 0...240V AC, 47...63 Hz ATEX/IECEX, 125V AC Max Do not exceed 10 A current draw at the MOD or SA Power RTB.
Recommended external overcurrent protection	N/A
Power dissipation, max	8.5 W
Thermal dissipation, max	29 BTU/hr
Isolation voltage	250V (continuous), basic insulation type, SA, and MOD Power to backplane 250V (continuous), basic insulation type, SA to MOD Power 250V (continuous), basic insulation type, Ethernet to backplane 250V (continuous), double insulation type, Ethernet to MOD Power 250V (continuous), double insulation type, Ethernet to SA Power 50V (continuous), functional insulation type, Ethernet to USB 250V (continuous), basic insulation type, USB to backplane 250V (continuous), double insulation type, USB to MOD Power 250V (continuous), double insulation type, USB to SA Power No isolation between Ethernet ports Type tested at 1500V AC for 60 s
Module keying	Electronic keying via programming software
Dimensions (HxWxD), approx	138 x 98 x 137 mm (5.43 x 3.86 x 5.39 in.)

## Technical Specifications

Attribute	5069-AEN2TR
RTB	RTBs are available in separately ordered 5069 RTB kits. The MOD power connection uses a 4-point RTB, and the SA power connection uses a 6-point RTBs. The following kits are available: <ul style="list-style-type: none"> <li>Kit catalog number 5069-RTB64-SCREW contains RTB catalog numbers 5069-RTB6-SCREW and 5069-RTB4-SCREW</li> <li>Kit catalog number 5069-RTB64-SPRING contains RTB catalog numbers 5069-RTB6-SPRING and 5069-RTB4-SPRING</li> </ul> <b>IMPORTANT:</b> You must order RTBs separately. RTBs do not ship with Compact 5000 I/O EtherNet/IP adapters. We recommend that you order only the RTB type that your system requires.
RTB torque (5069-RTB4-SCREW and 5069-RTB6-SCREW only)	0.4 N•m (3.5 lb•in)
RTB keying	None
Wiring category <sup>(3)</sup>	3 - on USB port 2 - on power ports 2 - on Ethernet ports
Wire size	
5069-RTB4-SPRING, 5069-RTB6-SPRING	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation, single wire connection only
5069-RTB4-SCREW, 5069-RTB6-SCREW	0.5...1.5 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation, single wire connection only
Ethernet connections	Ethernet Cabling and Installation according to IEC 61918 and IEC 61784-5-2
Insulation stripping length	
5069-RTB4-SPRING, 5069-RTB6-SPRING connections	10 mm (0.39 in.)
5069-RTB4-SCREW, 5069-RTB6-SCREW connections	12 mm (0.47 in.)
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4

(1) Maximum level of MOD Power current that the adapter can pass through to the next module in the system.

(2) Maximum level of SA Power current that the adapter can pass through to the next module in the system.

(3) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

## Environmental Specifications

Attribute	5069-AEN2TR
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	5 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC61000-4-2	6 kV contact discharges 8 kV air discharges

## Environmental Specifications

Attribute	5069-AEN2TR
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on Ethernet ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±2 kV line-earth (CM) on Ethernet ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on power and Ethernet ports
Voltage variation IEC 61000-4-29	10 ms interruption on MOD Power port

## Certifications

Certifications <sup>(1)</sup>	5069-AEN2TR
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2014/35/EU LVD, compliant with: <ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> European Union 2011/65/EU RoHS, compliant with: <ul style="list-style-type: none"> <li>EN 50581; Technical documentation</li> </ul>
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>DEMKO 15 ATEX 1455X</li> </ul> When used at or below 125V AC
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> <li>IEC 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>IEC 60079-0; General Requirements</li> <li>II 3 G Ex nA IIC T4 Gc</li> <li>IECEX UL 15.0007X</li> </ul> When used at or below 125V AC
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation
EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## Minimum Spacing Requirements

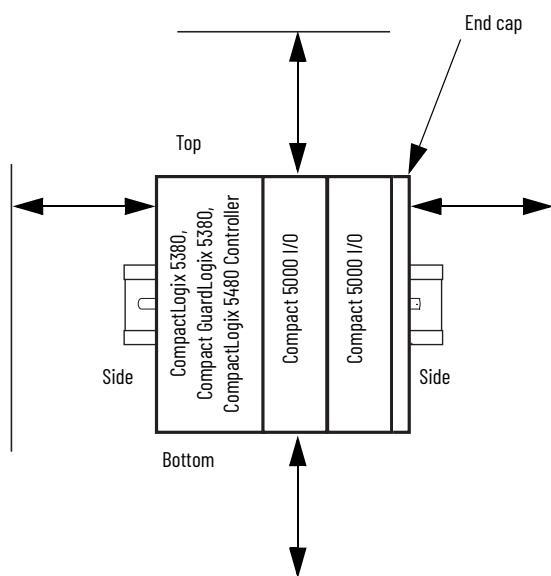
There are minimum spacing requirements based on whether Compact 5000 I/O modules are installed in a CompactLogix™ 5380, Compact GuardLogix® 5380, CompactLogix 5480 controller system or in a Compact 5000 I/O EtherNet/IP adapter system.

### Controller Minimum Spacing Requirements

The minimum distance between the controller system and enclosure walls, wireways, and adjacent equipment varies based on current operating temperatures.

The minimum distances on all sides of the system are as follows:

- CompactLogix 5380 Controllers
  - 50.80 mm (2.00 in.) at 55 °C (131 °F)
  - 101.60 mm (4.00 in) at 60 °C (140 °F)
- Compact GuardLogix 5380 Controllers
  - 50.80 mm (2.0 in.) at 50 °C (122 °F)
  - 101.7 mm (4.00 in.) at 55 °C (131 °F)
  - 152.4 mm (6.00 in) at 60 °C (140 °F)
- CompactLogix 5480 Controllers
  - 25.00 mm (0.98 in.) between the sides and the cabinet
  - 25.00 mm (0.98 in.) between the front of the controller and the cabinet
  - 50.00 mm (1.96 in.) between the top and bottom and the cabinet



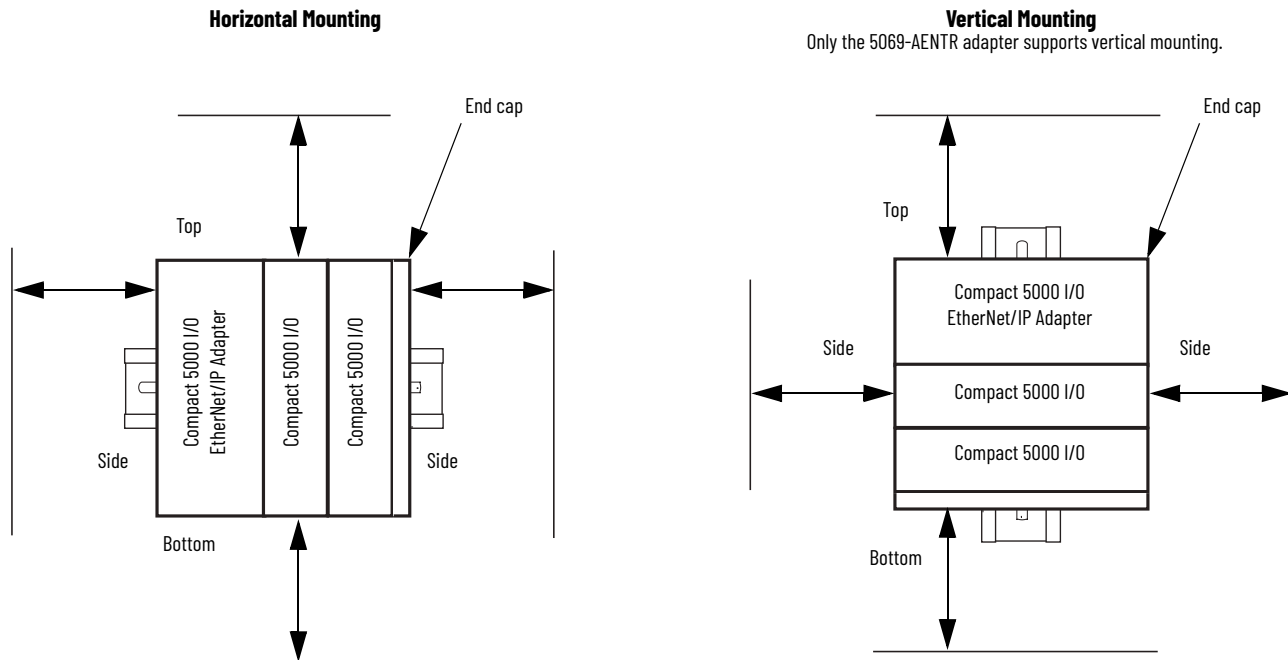
For more information on how to install a CompactLogix 5380, Compact GuardLogix 5380, and CompactLogix 5480 controller system, see these publications:

- CompactLogix 5380 Controllers Installation Instructions, publication [5069-IN013](#)
- Compact GuardLogix 5380 SIL 2 Controllers Installation Instructions, publication [5069-IN014](#)
- CompactLogix 5480 Controllers Installation Instructions, publication [5069-IN019](#)

## Adapter Minimum Spacing Requirements

The minimum distances on all sides of the adapter system are as follows:

- 25.40 mm (1.00 in) - If the system uses only Compact 5000 I/O standard modules.
- 50.80 mm (2.00 in) - If the system uses at least one Compact 5000 I/O safety module.



For more information on how to install a Compact 5000 I/O EtherNet/IP adapter system, see the Compact 5000 I/O EtherNet/IP Adapters Installation Instructions, publication [5069-IN003](#).

**Notes:**



## Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Compact 5000 I/O Digital Modules User Manual, publication <a href="#">5069-UM004</a>	Describes how to configure and operate Compact 5000™ I/O digital modules.
Compact 5000 I/O Analog Modules User Manual, publication <a href="#">5069-UM005</a>	Describes how to configure and operate Compact 5000 I/O analog modules.
Compact 5000 I/O High-speed Counter Module User Manual, publication <a href="#">5069-UM006</a>	Describes how to configure and operate the Compact 5000 I/O high-speed counter module.
Compact 5000 I/O Serial Module User Manual, publication <a href="#">5069-UM003</a>	Describes how to configure and operate Compact 5000 serial modules.
CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, publication <a href="#">5069-UM001</a>	Describes how to configure and operate CompactLogix™ 5380 and Compact GuardLogix® 5380 controllers.
CompactLogix 5480 Controllers User Manual, publication <a href="#">5069-UM002</a>	Describes how to configure and operate CompactLogix 5480 controllers.
Compact 5000 EtherNet/IP Adapters User Manual, publication <a href="#">5069-UM007</a>	Describes how to configure and operate the Compact 5000 I/O EtherNet/IP™ adapters.
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation® industrial system.
Product Certifications website, <a href="http://www.rockwellautomation.com/global/certification/overview.page">http://www.rockwellautomation.com/global/certification/overview.page</a>	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at [rok.auto/literature](http://rok.auto/literature).

# Rockwell Automation Support

Use these resources to access support information.

<b>Technical Support Center</b>	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	<a href="http://rok.auto/support">rok.auto/support</a>
<b>Knowledgebase</b>	Access Knowledgebase articles.	<a href="http://rok.auto/knowledgebase">rok.auto/knowledgebase</a>
<b>Local Technical Support Phone Numbers</b>	Locate the telephone number for your country.	<a href="http://rok.auto/phonesupport">rok.auto/phonesupport</a>
<b>Literature Library</b>	Find installation instructions, manuals, brochures, and technical data publications.	<a href="http://rok.auto/literature">rok.auto/literature</a>
<b>Product Compatibility and Download Center (PCDC)</b>	Get help determining how products interact, check features and capabilities, and find associated firmware.	<a href="http://rok.auto/pcdc">rok.auto/pcdc</a>

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