

# COMPACT 5000 I/O Modules and EtherNet/IP Adapters Specifications

Digital I/O Module Catalog Numbers 5069-IA16, 5069-IB16, 5069-IB16F, 5069-IB6F-3W, 5069-OA16, 5069-OB8, 5069-OB16, 5069-OB16F, 5069-OW4I, 5069-OW16, 5069-OX4I

Analog I/O Module Catalog Numbers 5069-IF8, 5069-IY4, 5069-OF4, 5069-OF8

High-speed Counter Module Catalog Number 5069-HSC2x0B4

Field Potential Distributor Catalog Number 5069-FPD

Address Reserve Module Catalog Number 5069-ARM

EtherNet/IP Adapter Catalog Number 5069-AENTR, 5069-AEN2TR

| Topic                                   | Page |
|---|------|
| Summary of Changes                      | 2    |
| Digital I/O Modules                     | 2    |
| Analog I/O Modules                      | 48   |
| 5069-HSC2x0B4 High-speed Counter Module | 71   |
| 5069-FPD Field Potential Distributor    | 80   |
| 5069-ARM Address Reserve Module         | 84   |
| 5069-AENTR EtherNet/IP Adapter          | 87   |
| 5069-AEN2TR EtherNet/IP Adapter         | 92   |

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 controller systems or as remote I/O modules with CompactLogix 5380 controllers and some other LOGIX 5000 controllers. The modules are configured with the Studio 5000 Logix Designer® application.

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

This publication was revised to update the **Overvoltage protection, max** specification for the 5069-IY4 and 5069-IF8 modules. The **Overvoltage protection, max** specification for the 5069-IY4 and 5069-IF8 modules is  $\pm 30V$  DC. For more information, see [page 54](#) and [page 60](#)

## Digital I/O Modules

| I/O Type          | Cat. No.     | Page |
|-------------------|--------------|------|
| AC digital input  | 5069-IA16    | 3    |
| DC digital input  | 5069-IB16    | 8    |
|                   | 5069-IB16F   | 8    |
|                   | 5069-IB6F-3W | 13   |
| AC digital output | 5069-OA16    | 18   |
| DC digital output | 5069-OB8     | 23   |
|                   | 5069-OB16    | 28   |
|                   | 5069-OB16F   | 28   |
| Relay output      | 5069-OW4I    | 33   |
|                   | 5069-OW16    | 38   |
|                   | 5069-OX4I    | 43   |

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

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

#### 5069-IA16 Wiring Diagram

##### 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
- 5069-AENTR or 5069-AEN2TR EtherNet/IP adapter
- 5069-FPD Field Potential Distributor

##### IMPORTANT: Remember the following:

- 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 COMPACT 5000 I/O system that use AC SA power and DC SA power, you must install them on separate SA Power buses.

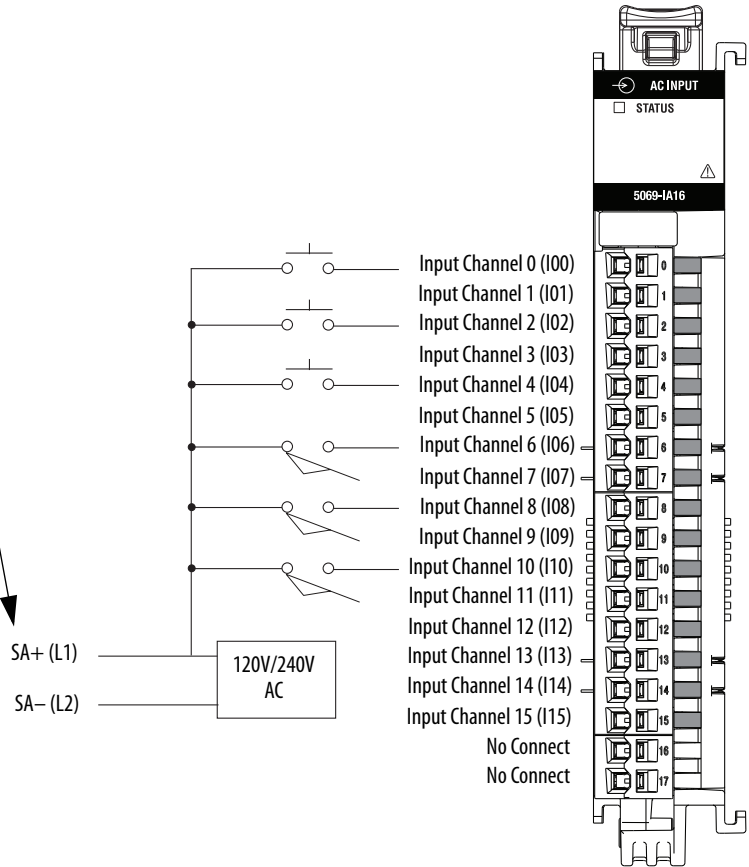
You use the 5069-FPD field potential distributor to establish a new SA Power bus in a COMPACT 5000 I/O system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete the following steps.

1. Install the modules that use one type of SA power, for example AC, 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 DC, on the second SA Power bus.

##### Channel Connections

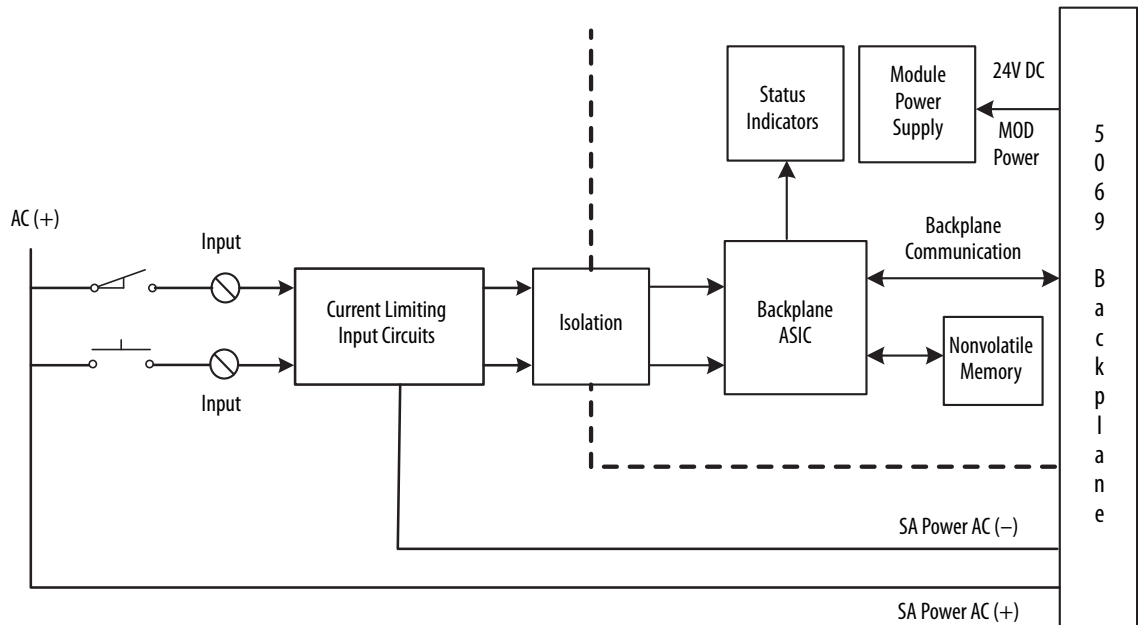
The example shows devices that are connected to channels 0, 2, 4, 6, 8, and 10. You are not restricted to using only those channels.

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



This 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<br>3 mA @ 164V AC  |
| On-state current, nom          | 5 mA @ 120V AC/50 Hz<br>6 mA @ 120V AC/60 Hz<br>9 mA @ 240V AC/50 Hz<br>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<br>20 kΩ @ 120V AC/60 Hz<br>27 kΩ @ 240V AC/50 Hz<br>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)  |
| Input filter times             |  |
| Off to On                      | Hardware delay: 10 ms (typ) + filter time<br>User-selectable filter times:<br>• 120V AC input - 1 ms<br>• 240V AC input - 1 ms, 2 ms, 5 ms           |
| On to Off                      | Hardware delay: 10 ms (typ) + filter time<br>User-selectable filter times:<br>• 120V AC input - 10 ms, 20 ms<br>• 240V AC input - 5 ms, 10 ms, 20 ms |

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 5000 Series Digital I/O Modules in Logix5000 Control Systems User Manual, publication 5000-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) <sup>(1)</sup>   | 9.55 A @ 18...32V DC  |
| SA Power   | 240 mA @ 79...264V AC   |
| SA Power (Passthrough) <sup>(2)</sup>  | 9.975 A @ 79...264V AC  |
| Do not exceed 10 A MOD or SA Power (Passthrough) current draw.<br>The 5069-IA16 module complies to ATEX/IECEx when used at or below 125V AC. |   |
| Power dissipation  | 3.5 W   |
| Thermal dissipation  | 11.9 BTU/hr   |
| Isolation voltage  | 300V (continuous), Basic Insulation Type<br>Type tested at 1800V AC for 60 s<br>No isolation between individual channels  |
| Module keying  | Electronic keying via programming software  |
| Indicators   | 1 green/red module status indicator<br>16 yellow I/O status indicators  |
| Slot width   | 1   |
| Dimensions (HxWxD)   | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)  |
| DIN rail   | Compatible zinc-plated, chromate-passivated steel DIN rail.<br>EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)  |
| RTB  | One of the following RTB types.<br><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. |
| Terminal screw torque (5069-RTB18-SCREW RTB only)  | 0.4 N-m (3.5 lb-in)   |
| RTB keying   | None  |
| Wire category  | 2 - input ports<br>2 - power ports<br>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.  |

**General Specifications - 5069-IA16**

| Attribute                     | 5069-IA16         |
|-------------------------------|-------------------|
| 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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

**Environmental Specifications - 5069-IA16**

| Attribute  | 5069-IA16  |
|--|--|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold),<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)   |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing  |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g   |
| Emissions  | IEC 61000-6-4  |
| ESD immunity<br>IEC 61000-4-2  | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC 61000-4-3  | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4  | ±4 kV @ 5 kHz on power ports<br>±4 kV @ 5 kHz on signal ports  |

**Environmental Specifications - 5069-IA16**

| Attribute                                 | 5069-IA16   |
|---|---|
| Surge transient immunity<br>IEC 61000-4-5 | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports |
| Conducted RF immunity<br>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**

| Certification <sup>(1)</sup> | 5069-IA16   |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>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> |
| 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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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 and 5069-IB16F Digital 16-point Sinking Input Modules

This figure shows a wiring diagram for the 5069-IB16 and 5069-IB16F modules.

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

##### 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 5000 I/O EtherNet/IP adapter
- 5069-FPD Field Potential Distributor

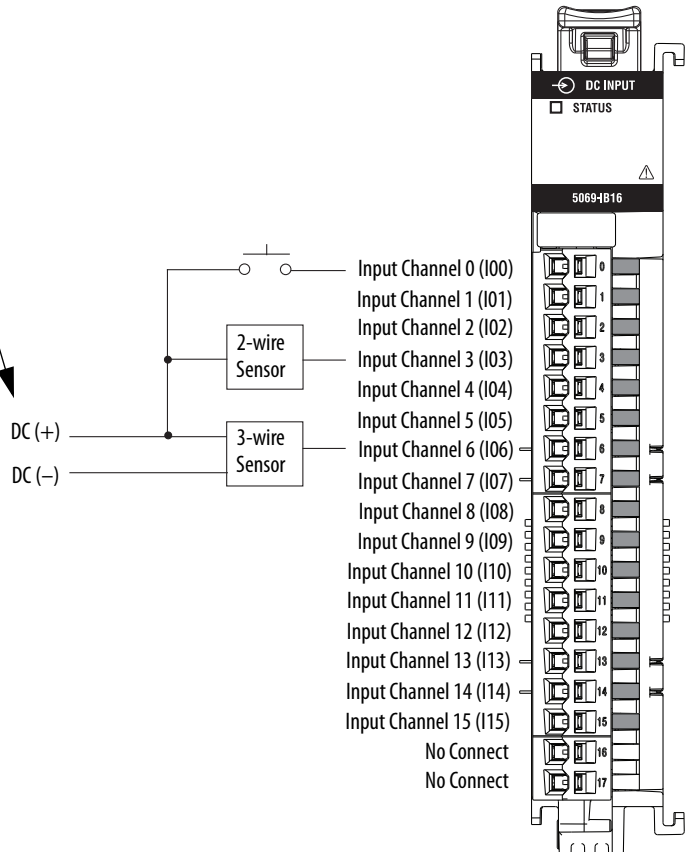
**IMPORTANT:** Remember the following:

- The 5069-IB16 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 COMPACT 5000 I/O 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 COMPACT 5000 I/O 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 AC, 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 DC, on the second SA Power bus.

##### Channel Connections

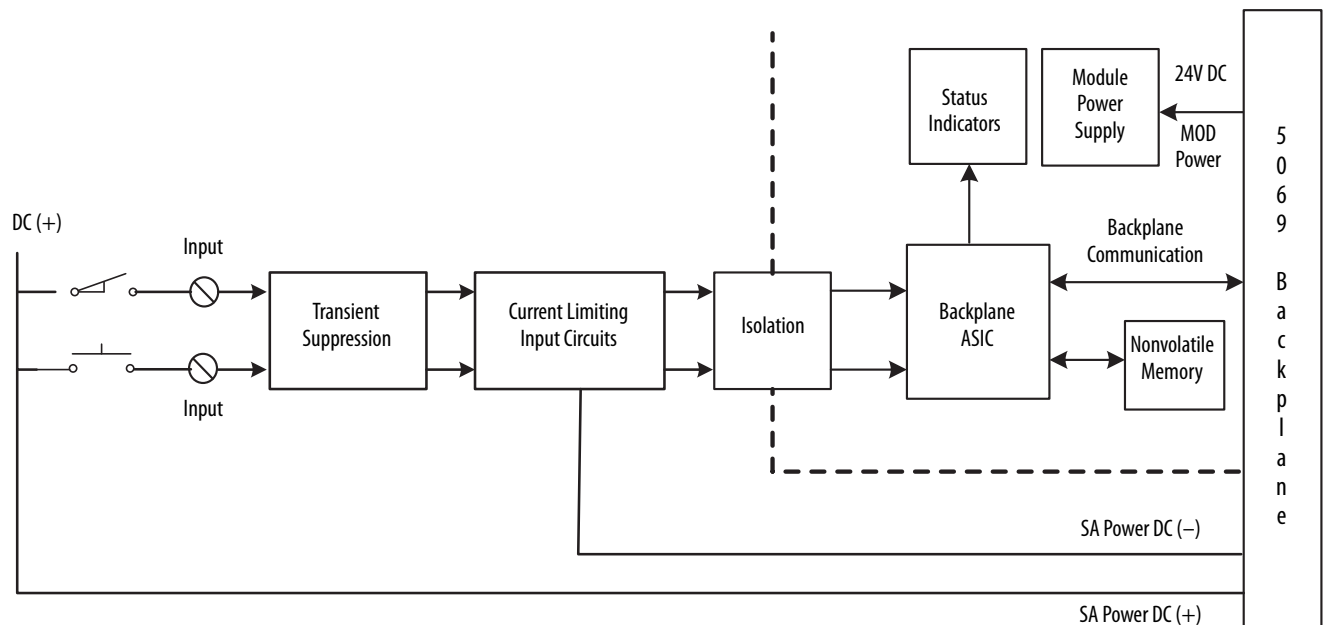
The example shows devices connected to channels 0, 3, and 6. You are not restricted to using only those channels.

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



This figure shows a functional block diagram for the 5069-IB16 and 5069-IB16F modules.

#### 5069-IB16 and 5069-IB16F Functional Block Diagram





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

| Attribute                             | 5069-IB16   | 5069-IB16F   |
|---------------------------------------|---|--|
| 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 current, min <sup>(1)</sup>  | 5 mA @ 10V  |  |
| On-state current, nom <sup>(1)</sup>  | 6 mA @ 24V DC   |  |
| On-state current, max <sup>(1)</sup>  | 7.4 mA @ 32V DC   |  |
| Off-state voltage, max <sup>(1)</sup> | 5V DC   |  |
| Off-state current, min <sup>(1)</sup> | 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                             | ≤ 100 μs, ±10 μs @ 25 °C (77 °F)  | ≤ 10 μs, ±10 μs @ 25 °C (77 °F)  |
| On to Off                             | ≤ 100 μs, ±10 μs @ 25 °C (77 °F)  | ≤ 10 μs, ±10 μs @ 25 °C (77 °F)  |
| Input drift                           | 10 ns/°C (°F)   | < 10 ns/°C (°F)  |
| Input drift over temperature span     | ±100 ns/°C (°F) 0...60 °C (32...140 °F)                                       | ±10 ns/°C (°F) 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   |
| Input filter time                     |   |  |
| Off to On                             | Hardware delay: 50 μs + filter time<br>User-selectable filter time: 0...50 ms | Hardware delay: 2 μs + filter time<br>User-selectable filter time: 0...50 ms |
| On to Off                             | Hardware delay: 50 μs + filter time<br>User-selectable filter time: 0...50 ms | Hardware delay: 3 μs + filter time<br>User-selectable filter time: 0...50 ms |
| Reverse polarity protection           | Yes   |  |
| Overvoltage protection, max           | 36V (fuse protected)  |  |
| Pulse and period measurements         | Not supported   | ±2 μs  |
| Simple counters<br>Counter frequency  | 0 - f <sub>max</sub> = 500 Hz (inv period 2 ms)                               | 0 - f <sub>max</sub> = 30 kHz (inv period 33.3 μs)                           |
| Frequency counter                     | 0 - f <sub>max</sub> = 500 Hz (inv period 2 ms)                               | 0 - f <sub>max</sub> = 30 kHz (inv period 33.3 μs)                           |
| Timestamp of inputs                   | Not supported   | ±10 μs accuracy<br>1 ns resolution   |
| CIP sync                              | Not supported   | Transport clock, and slave only ordinary clock                               |
| 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   |  |

(1) Sensor Actuator (SA) Power-related attributes.

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

| Attribute   | 5069-IB16  | 5069-IB16F |
|---|--|------------|
| Inputs  | 16 Channels (1 group of 16), sinking   |            |
| Voltage category  | 12/24V DC Sink   |            |
| Voltage and current ratings   |  |            |
| Input voltage range   | 10...32V DC  |            |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |            |
| Module Power bus (MOD Power) current, max                               | 75 mA  |            |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |            |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |            |
| Sensor Actuator Power bus (SA Power) voltage range                      | 10...32V DC  |            |
| Sensor Actuator Power bus (SA Power) current, max                       | 200 mA module  |            |
| Sensor Actuator Power bus (SA Power) Passthrough voltage range          | 10...32V DC  |            |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A   |            |
| Power dissipation, max  | 3.9 W  |            |
| Thermal dissipation, max  | 13.3 BTU/hr  |            |
| Isolation voltage   | 300V (continuous), Basic Insulation Type<br>No isolation between SA Power and input ports<br>No isolation between individual input ports   |            |
| Module keying   | Electronic keying via programming software   |            |
| Indicators  | 1 green/red module status indicator<br>16 yellow I/O status indicators   |            |
| Slot width  | 1  |            |
| Dimensions (HxWxD), approx  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |            |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes:<br>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)<br>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.)   |            |
| RTB   | One of the following RTB types.<br>• 5069-RTB18-SPRING RTB<br>• 5069-RTB18-SCREW RTB<br><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. |            |
| Terminal screw 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<br>2 - power ports<br>1 wire per terminal for each signal port   |            |

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

| Attribute                     | 5069-IB16  | 5069-IB16F |
|-------------------------------|--|------------|
| 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.)<br>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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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 and 5069-IB16F**

| Attribute  | 5069-IB16, 5069-IB16F                          |
|--|--|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold),<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)                   |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing                          |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz                            |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g   |
| Emissions  | IEC 61000-6-4                                  |
| ESD immunity<br>IEC 61000-4-2  | 6 kV contact discharges<br>8 kV air discharges |

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

| Attribute                                 | 5069-IB16, 5069-IB16F   |
|---|---|
| Radiated RF immunity<br>IEC 61000-4-3     | 10V/m with 1 kHz sine-wave 80% AM from 80. . .2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000 . . .2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4           | ±4 kV @ 5 kHz on power ports<br>±3 kV @ 5 kHz on input ports  |
| Surge transient immunity<br>IEC 61000-4-5 | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±1 kV line-line (DM) and ±2 kV line-earth (CM) on input ports  |
| Conducted RF immunity<br>IEC 61000-4-6    | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz. . .80 MHz   |
| Voltage variation<br>IEC 61000-4-29       | 10 ms interruption on MOD Power port  |

**Certifications - 5069-IB16 and 5069-IB16F**

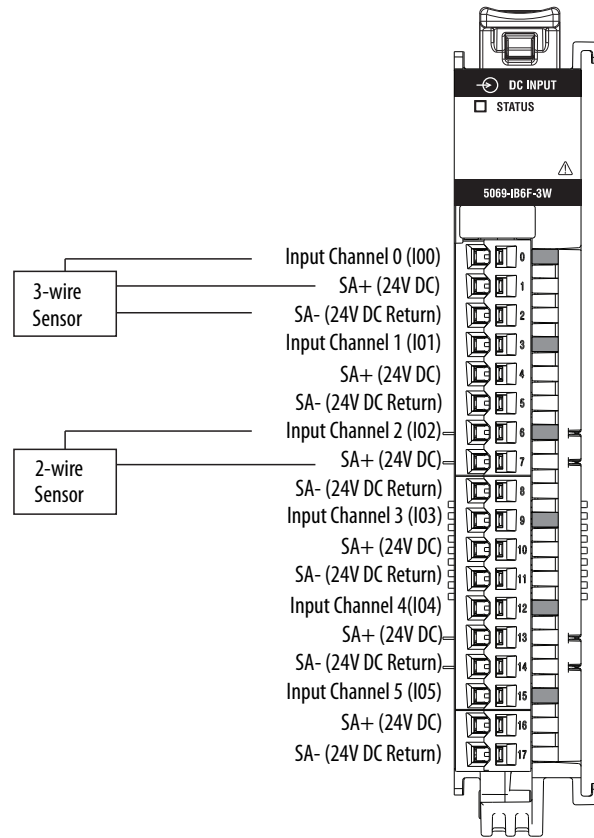
| Certification <sup>(1)</sup> | 5069-IB16, 5069-IB16F   |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for 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> |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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

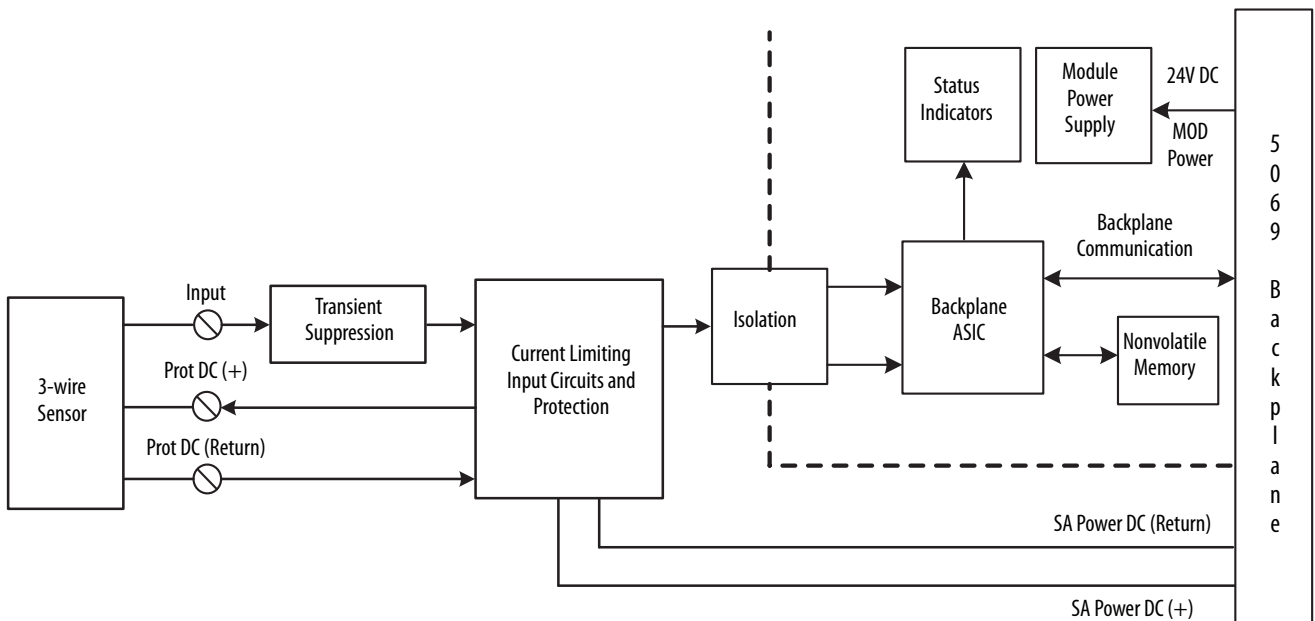
This figure shows a wiring diagram for the 5069-IB6F-3W module.

**5069-IB6F-3W Wiring Diagram**



This 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 <sup>(1)</sup>  | 10V DC   |
| On-state voltage, nom <sup>(1)</sup>  | 24V DC   |
| On-state voltage, max <sup>(1)</sup>  | 32V DC   |
| Off-state voltage, max <sup>(1)</sup> | 5V DC  |
| On-state current, min <sup>(1)</sup>  | 5 mA @ 10V DC  |
| On-state current, nom <sup>(1)</sup>  | 6 mA @ 24V DC  |
| On-state current, max <sup>(1)</sup>  | 7.4 mA @ 32V DC  |
| Off-state current, min <sup>(1)</sup> | 1.5 mA   |
| Input impedance, nom                  | 4.1 kΩ   |
| Input impedance, input, 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, ±10 μs @ 25 °C (77 °F)  |
| On to Off                             | ≤ 10 μs, ±10 μs @ 25 °C (77 °F)  |
| Input drift                           | <10 ns/°C (°F)   |
| Input drift over temperature span     | ±10 ns/°C (°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   |
| Input filter time                     |  |
| Off to On                             | Hardware delay: 2 μs + filter time<br>User-selectable filter time: 0...50 ms |
| On to Off                             | Hardware delay: 3 μs + filter time<br>User-selectable filter time: 0...50 ms |
| Reverse polarity protection           | Yes  |
| Overvoltage protection, max           | 36V (fuse protected)   |
| Pulse width and period measurements   | ±2 μs  |
| Simple counters<br>Counter frequency  | 0 - f <sub>max</sub> = 30 kHz (inv period 33.3 μs)                           |
| Frequency counter                     | 0 - f <sub>max</sub> = 30 kHz (inv period 33.3 μs)                           |
| Timestamp of inputs                   | ±10 μs accuracy<br>1 ns resolution   |
| CIP sync (PTPO clock)                 | Transport clock, and slave only ordinary clock                               |
| Overrides                             | Not supported  |
| Pulse latching                        | Supported  |
| Events                                | 4 events supported (triggered by any input or simple counters)               |
| Pattern matching                      | Supported  |
| Extended counters                     | Not supported  |

(1) Sensor Actuator (SA) Field Power related attributes.

**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 voltage range   | 10...32V DC  |
| Module Power bus (MOD Power) voltage range                              | 18V...32V DC   |
| Module Power bus (MOD Power) current, max                               | 75 mA  |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |
| Sensor Actuator Power bus (SA Power) voltage range                      | 10...32V DC  |
| Sensor Actuator Power bus (SA Power) current, max                       | 150 mA per channel<br>900 mA module  |
| Sensor Actuator Power bus (SA Power) Passthrough voltage range          | 10...32V DC  |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A   |
| Power dissipation, max  | 2.4 W  |
| Thermal dissipation, max  | 8.1 BTU/hr   |
| Isolation voltage   | 300V (continuous), Basic Insulation Type<br>No isolation between SA Power and input ports<br>No isolation between individual input ports   |
| Module keying   | Electronic, module keying, software configurable   |
| Indicators  | 1 green/red module status indicator<br>6 yellow I/O status indicators  |
| Slot width  | 1  |
| Dimensions (HxWxD), approx  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes:<br>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)<br>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.)   |
| RTB   | One of the following RTB types.<br>• 5069-RTB18-SPRING RTB<br>• 5069-RTB18-SCREW RTB<br><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. |
| Terminal screw 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<br>2 - power ports<br>1 wire per terminal for each signal port   |

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

| Attribute                                  | 5069-IB6F-3W  |
|--|---|
| 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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)                 |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing                        |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz                          |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g   |
| Emissions  | IEC 61000-6-4                                |
| ESD immunity<br>IEC 61000-4-2  | 6 kV contact discharge<br>8 kV air discharge |



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

| Attribute                                 | 5069-IB6F-3W   |
|---|--|
| Radiated RF immunity<br>IEC 61000-4-3     | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM @ 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4           | ±4 kV @ 5 kHz on power ports<br>±3 kV @ 5 kHz on input ports   |
| Surge transient immunity<br>IEC 61000-4-5 | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±1 kV line-line (DM) and ±2 kV line-earth (CM) on input ports   |
| Conducted RF immunity<br>IEC 61000-4-6    | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz  |
| Voltage variation<br>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.<br>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:<br><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:<br><ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>EN 61000-6-4; Industrial Emissions   |
| Ex                           | European Union 2014/34/EU ATEX Directive, compliant with:<br><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:<br><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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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-OA16 Digital 16-point 120/240V AC Output Module

This figure shows a wiring diagram for the 5069-OA16 module.

### 5069-OA16 Wiring Diagram

#### 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 5000 I/O EtherNet/IP adapter
- 5069-FPD Field Potential Distributor

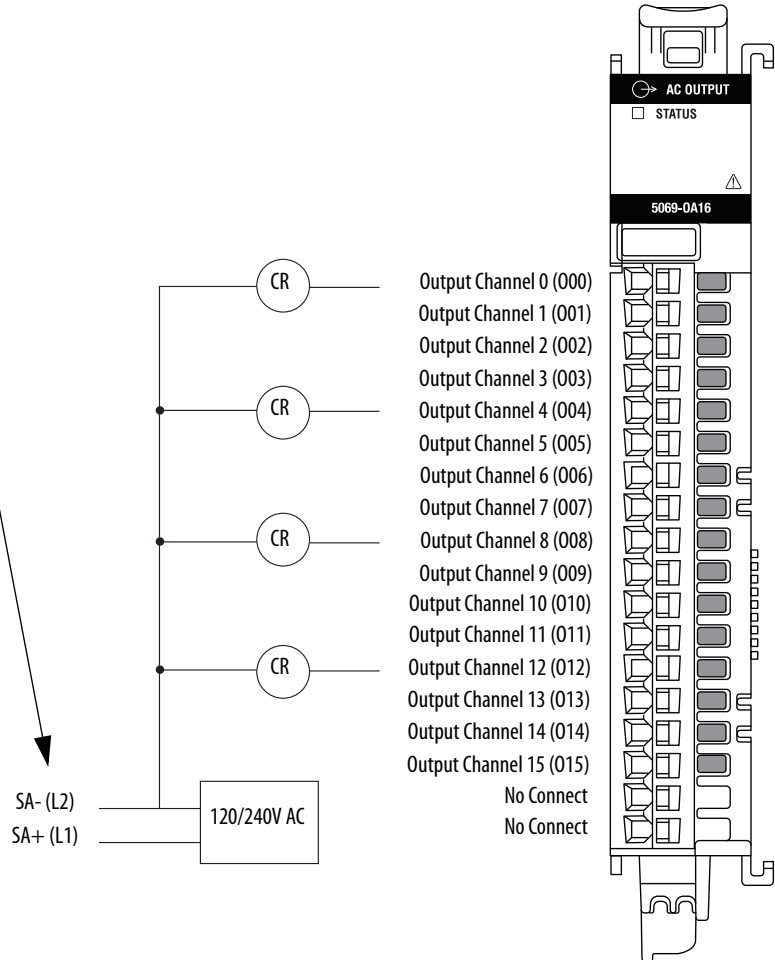
#### IMPORTANT: Remember the following:

- The 5069-OA16 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 COMPACT 5000 I/O 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 COMPACT 5000 I/O 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 AC, 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 DC, on the second SA Power bus.

#### Channel Connections

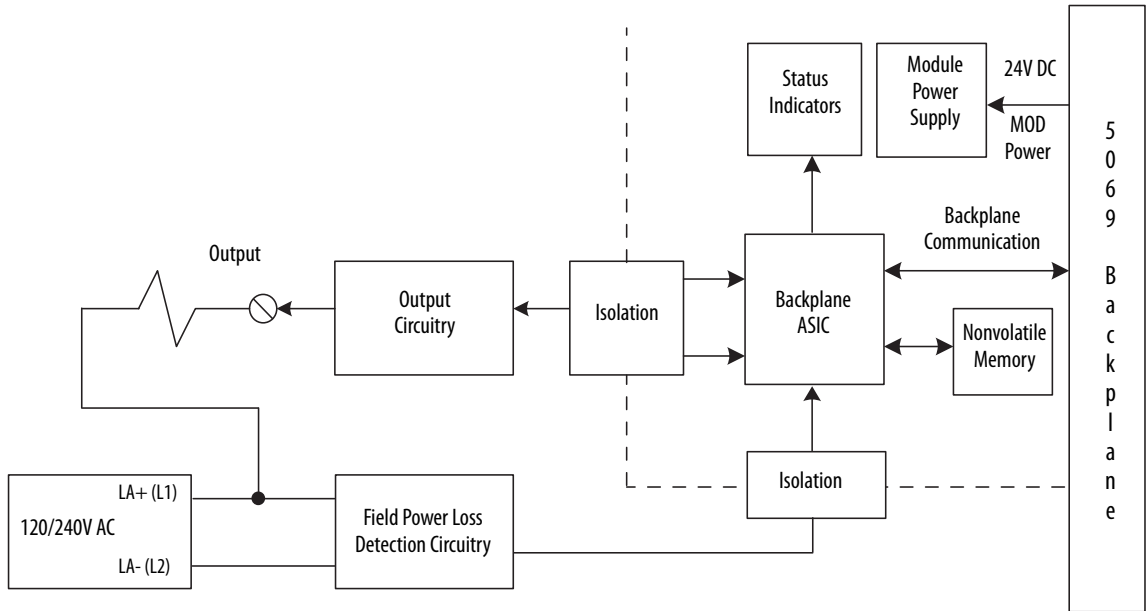
The example shows devices connected to channels 0, 4, 8, and 12. You are not restricted to using only those channels.

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



This figure shows a functional block diagram for the 5069-OA16 module.

**5069-OA16 Functional Block Diagram**



**Technical Specifications - 5069-OA16**

| Attribute  | 5069-OA16  |
|--|--|
| 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  |
| Open load detection diagnostics                  | Not supported  |
| Output short circuit/overload/overtemp 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<br>0.5 A pilot duty   |
| Increased output current capability              | 16 outputs can be paralleled to increase current capability by 0.25 A per channel<br>8 outputs can be paralleled to increase current capability by 0.5 A 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 - 5069-0A16**

| 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) <sup>(1)</sup>   | 9.55 A @ 18...32V DC   |
| LA Power   | 4 A @ 85...264V AC   |
| SA Power (Passthrough) <sup>(2)</sup>  | 9.975 A @ 85...264V AC   |
| Do not exceed 10 A MOD or SA Power (Passthrough) current draw.<br>The 5069-0A16 module complies to ATEX/IECEx when used at or below 125V AC. |  |
| Power dissipation  | 3.4 W  |
| Thermal dissipation  | 11.6 BTU/hr  |
| Isolation voltage  | 300V (continuous), Basic Insulation Type<br>Type tested at 1800V AC for 60 s<br>No isolation between individual channels   |
| Module keying  | Electronic keying via programming software   |
| Indicators   | 1 green/red module status indicator<br>16 yellow I/O status indicators   |
| Slot width   | 1  |
| Dimensions (HxWxD)   | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |
| DIN rail   | Compatible zinc-plated, chromate-passivated steel DIN rail.<br>EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)   |
| RTB  | One of the following 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. |
| Terminal screw torque (5069-RTB18-SCREW RTB only)  | 0.4 N-m (3.5 lb-in)  |
| RTB keying   | None   |
| Wire category  | 2 - output ports<br>2 - power ports<br>1 wire per terminal for each signal port  |

**General Specifications - 5069-0A16**

| Attribute                     | 5069-0A16  |
|-------------------------------|--|
| 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.)<br>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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

**Environmental Specifications - 5069-0A16**

| Attribute  | 5069-0A16  |
|--|--|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold),<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)   |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing  |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g   |
| Emissions  | IEC 61000-6-4  |
| ESD immunity<br>IEC 61000-4-2  | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC 61000-4-3  | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4  | ±4 kV @ 5 kHz on power ports<br>±4 kV @ 5 kHz on signal ports  |

**Environmental Specifications - 5069-0A16**

| Attribute                                 | 5069-0A16   |
|---|---|
| Surge transient immunity<br>IEC 61000-4-5 | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports |
| Conducted RF immunity<br>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**

| Certification <sup>(1)</sup> | 5069-0A16   |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>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> |
| 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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>Russian Customs Union TR CU 004/2011 LV Technical Regulation   |

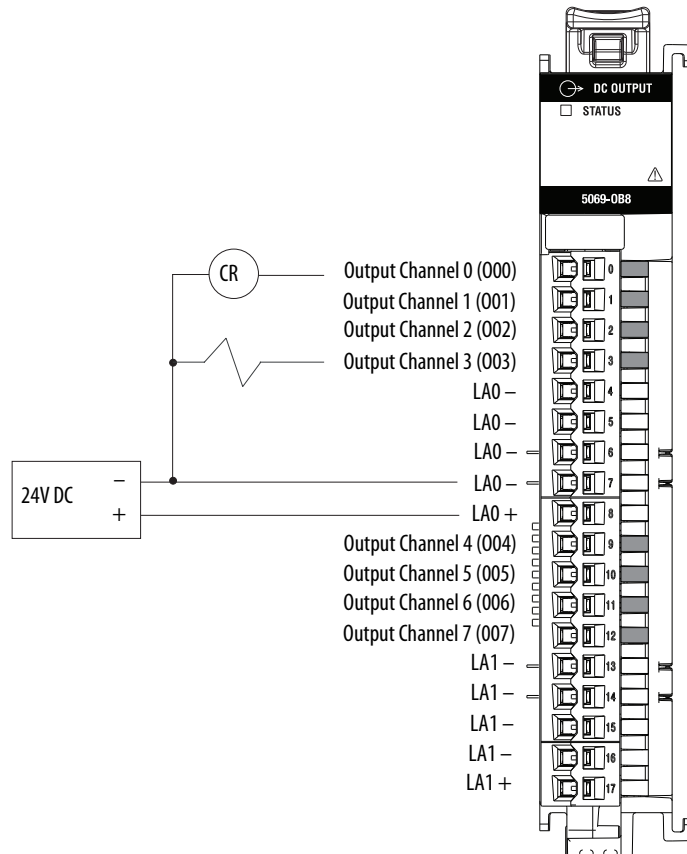
(1) See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

### 5069-OB8 Digital 8-point 24V DC Output Module

This figure shows a wiring diagram for the 5069-OB8 module.

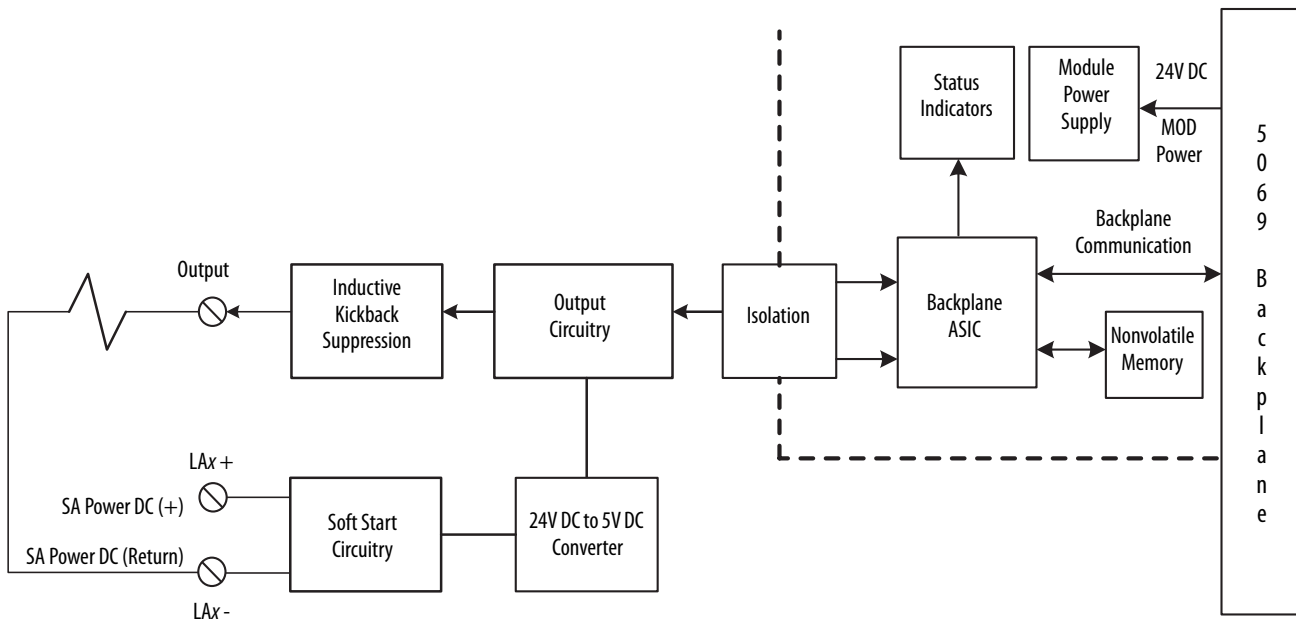
#### 5069-OB8 Wiring Diagram

**IMPORTANT:** The Local Actuator (LA+ and LA-) connections are used to supply field-side power to the module. The module does not draw current from the SA power bus that is internal to the system. Output channels 0...3 use LA0 +/-, and output channels 4...7 use LA1 +/-.



This figure shows a functional block diagram for the 5069-OB8 module.

#### 5069-OB8 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   |
| 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  | ±100 ns/°C (°F) from 0...60 °C (32...140 °F) @ 2 A   |
| Field power loss detection                              | Yes  |
| Open 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                                       | Resistive/General Pilot Duty<br>2 A pilot duty   |
| Increased output current capability                     | Outputs can be paralleled to increase current capability by 2 A 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>                         |
| 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 KΩ, 0.5W 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) <sup>(1)</sup>                         | 9.55 A @ 18...32V DC   |
| LA Power   | 2 A per channel @ 10...32V DC<br>8 A per group @ 10...32V DC<br>16 A per module @ 10...32V DC  |
| SA Power (Passthrough) <sup>(2)</sup>                          | 9.95 A @ 10...32V DC   |
| Do not exceed 10 A MOD or SA Power (Passthrough) current draw. |  |
| Power dissipation  | 3.2 W  |
| Thermal dissipation  | 10.9 BTU/hr  |
| Isolation voltage  | 300V (continuous), Basic Insulation Type<br>Type tested at 1800V AC for 60 s<br>No isolation between LA power and output ports<br>No isolation between individual output ports   |
| Module keying  | Electronic keying via programming software   |
| Indicators   | 1 green/red module status indicator<br>8 yellow I/O status indicators  |
| Slot width   | 1  |
| Dimensions (HxWxD)   | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |
| DIN rail   | Compatible zinc-plated, chromate-passivated steel DIN rail.<br>EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)   |
| RTB  | One of the following 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. |
| Terminal screw torque (5069-RTB18-SCREW RTB only)              | 0.4 N-m (3.5 lb-in)  |
| RTB keying   | None   |
| Wire category  | 2 - output ports<br>2 - power ports<br>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.)   |

**General Specifications - 5069-0B8**

| Attribute   | 5069-0B8            |
|---|---------------------|
| Terminal screw 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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

**Environmental Specifications - 5069-0B8**

| Attribute  | 5069-0B8   |
|--|--|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold),<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)   |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing  |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g   |
| Emissions  | IEC 61000-6-4  |
| ESD immunity<br>IEC 61000-4-2  | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC 61000-4-3  | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4  | ±4 kV @ 5 kHz on power ports<br>±4 kV @ 5 kHz on signal ports  |
| Surge transient immunity<br>IEC 61000-4-5  | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports  |
| Conducted RF immunity<br>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**

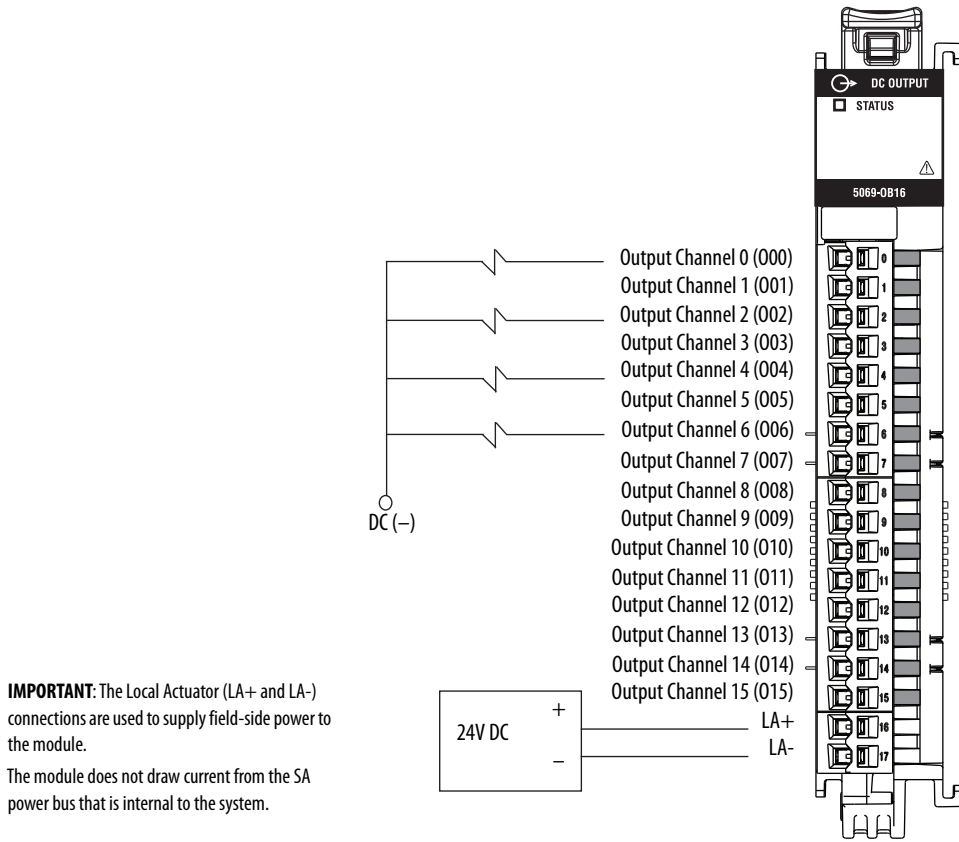
| Certification <sup>(1)</sup> | 5069-0B8  |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. 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> |
| 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<br>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 and 5069-OB16F Digital 16-point Sourcing Output Modules

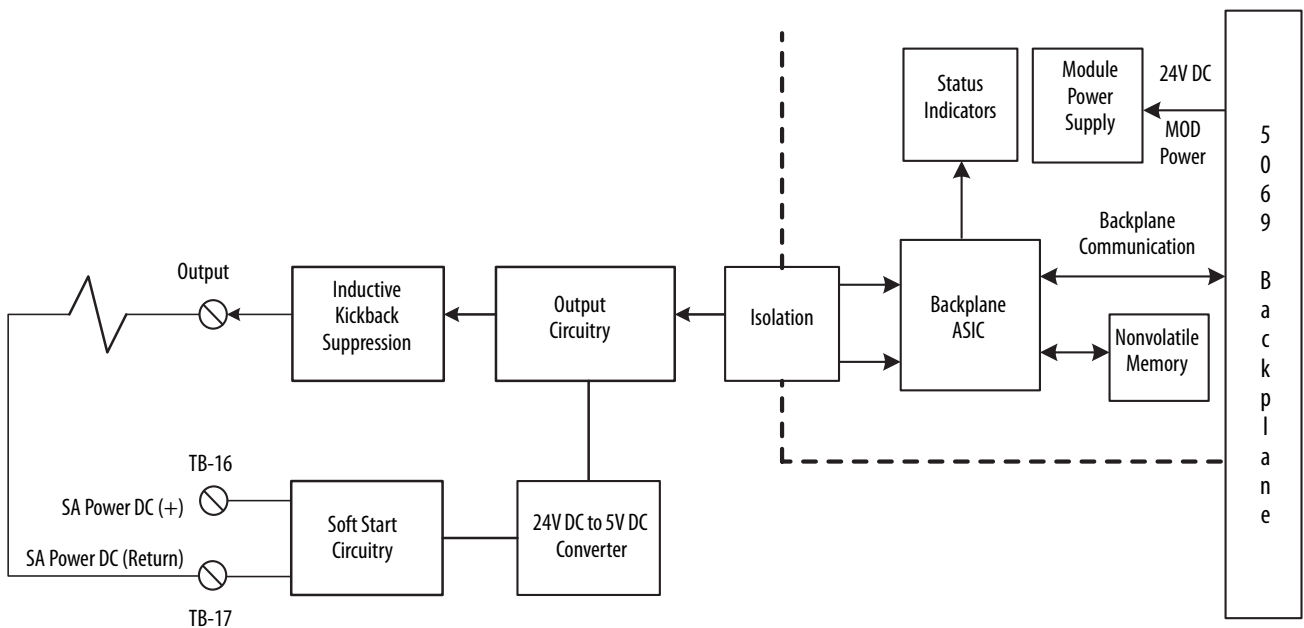
This figure shows a wiring diagram for the 5069-OB16 and 5069-OB16F modules.

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



This figure shows a functional block diagram for the 5069-OB16 and 5069-OB16F modules.

#### 5069-OB16 and 5069-OB16F Functional Block Diagram



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

| Attribute   | 5069-OB16  | 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 per channel<br>8 A per module, 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 @ 25 °C (77 °F) @ 0.5 A  |
| On to Off   | ≤ 100 μs, ±10 μs @ 25 °C (77 °F) @ 0.5 A   | ≤ 10 μs, @ 25 °C (77 °F) @ 0.5 A   |
| Pulse width, min  | ≤ 200 μs T <sub>on</sub> min + T <sub>off</sub> min @ 0.5 A @ 25 °C (77 °F)  | ≤ 20 μs T <sub>on</sub> min + T <sub>off</sub> min @ 0.5 A @ 25 °C (77 °F) |
| Output drift  | ±100 ns/°C (°F) from 0...60 °C (32...140 °F) @ 0.5 A   | ±10 ns/°C (°F) from 0...60 °C (32...140 °F) @ 0.5 A                        |
| Open 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  | 0.5 A pilot duty rating per channel @ 10...32V DC  |  |
| Increased output current capability                     | Outputs can be paralleled to increase current capability by 0.5 A 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>                         |  |
| 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<br>1 ns resolution   |
| CIP sync  | Not supported  | Supported  |

(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-OB16 and 5069-OB16F**

| Attribute   | 5069-OB16  | 5069-OB16F |
|---|--|------------|
| Outputs   | 16 Channels (1 group of 16), sourcing  |            |
| Voltage category  | 12/24V DC source   |            |
| Voltage and current ratings   |  |            |
| Output voltage range  | 10...32V DC  |            |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |            |
| Module Power bus (MOD Power) current, max                               | 75 mA  |            |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |            |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |            |
| Local Actuator Power bus (LA Power) voltage range                       | 10...32V DC  |            |
| Local Actuator Power bus (LA Power) current, max                        | 0.5 A per channel<br>8 A module  |            |
| Sensor Actuator Power bus (SA Power) Passthrough voltage range          | 10...32V DC  |            |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A   |            |
| Power dissipation, max  | 3.25 W (16 channels @ 0.5 A)   |            |
| Thermal dissipation, max  | 11.09 BTU/hr   |            |
| Isolation voltage   | 300V (continuous), Basic Insulation Type<br>No isolation between LA power and output ports<br>No isolation between individual output ports   |            |
| Module keying   | Electronic, module keying, software configurable   |            |
| Indicators  | 1 green/red module status indicator<br>16 yellow/red I/O status indicators   |            |
| Slot width  | 1  |            |
| Dimensions (HxWxD), approx  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |            |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes:<br>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)<br>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.)   |            |
| RTB   | One of the following RTB types.<br>• 5069-RTB18-SPRING RTB<br>• 5069-RTB18-SCREW RTB<br><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. |            |
| Terminal screw torque (5069-RTB18-SCREW)                                | 0.4 N·m (3.5 lb·in)  |            |
| RTB keying  | None   |            |
| Wire category <sup>(3)</sup>  | 2 - output ports<br>2 - power ports<br>1 wire per terminal for each signal port  |            |

**General Specifications - 5069-OB16 and 5069-OB16F**

| Attribute                                  | 5069-OB16   | 5069-OB16F |
|--|---|------------|
| 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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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 and 5069-OB16F**

| Attribute  | 5069-OB16, 5069-OB16F        |
|--|------------------------------|
| Temperature, operating<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing        |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz          |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g                         |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g                         |
| Emissions  | IEC 61000-6-4                |

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

| Attribute                                 | 5069-OB16, 5069-OB16F  |
|---|--|
| ESD immunity<br>IEC 61000-4-2             | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC 61000-4-3     | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4           | ±4 kV @ 5 kHz on power ports<br>±3 kV @ 5 kHz on output ports  |
| Surge transient immunity<br>IEC 61000-4-5 | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±1 kV line-line (DM) and ±2 kV line-earth (CM) on output ports  |
| Conducted RF immunity<br>IEC 61000-4-6    | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz  |
| Voltage variation<br>IEC 61000-4-29       | 10 ms interruption on MOD power port   |

**Certifications - 5069-OB16 and 5069-OB16F**

| Certification <sup>(1)</sup> | 5069-OB16, 5069-OB16F   |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>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> |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>Russian Customs Union TR CU 004/2011 LV Technical Regulation   |

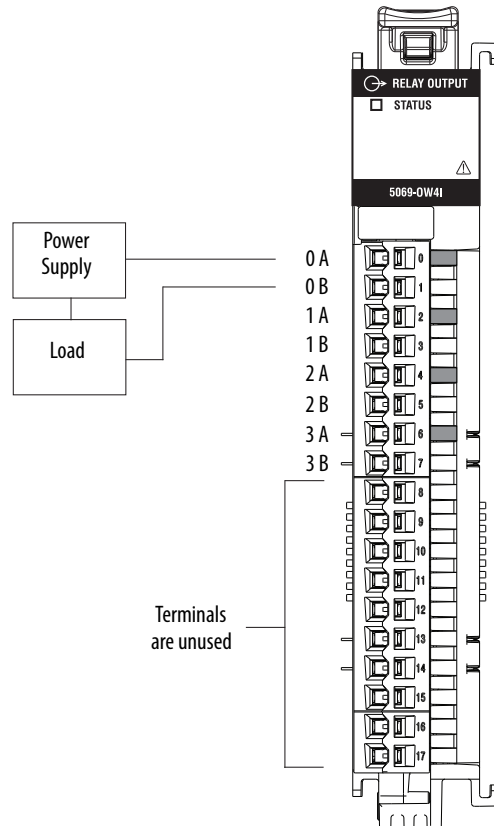
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.



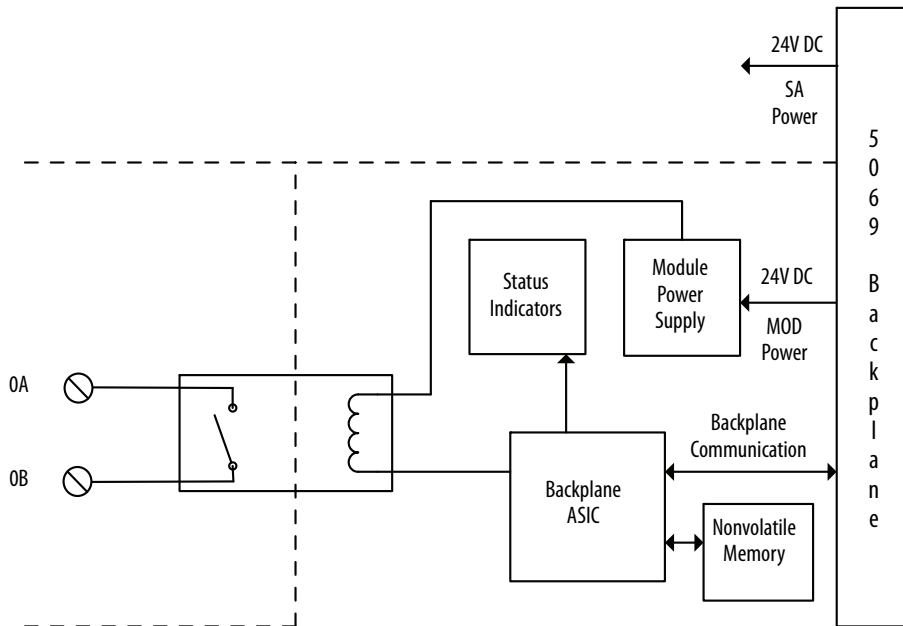
### 5069-OW4I Digital 4-point Isolated Relay Output Module

This figure shows a wiring diagram for the 5069-OW4I module.  
**5069-OW4I Wiring Diagram**

**IMPORTANT:** The 5069-OW4I module does not use SA power. That is, it does not draw current from the SA Power bus. The module passes it through to the next COMPACT 5000 I/O module in the system.



This figure shows a functional block diagram for the 5069-OW4I module.  
**5069-OW4I Functional Block Diagram**



**Technical Specifications - 5069-0W4I**

| Attribute                               | 5069-0W4I  |
|---|--|
| Relay rating <sup>(1)</sup>             | 5...30V DC, 2 A resistive/channel<br>5...264V AC, 50/60 Hz, 2 A resistive/channel<br>5...250V AC, 50/60 Hz, 2 A general use/channel<br>5...125V AC, 50/60 Hz, 2 A ATEX/IECEX<br>8 A maximum per module |
| Off-state leakage                       | 0 mA (dry contact, no onboard snubbers)  |
| Output current rating                   | 2 A per channel<br>8 A per module, max   |
| 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  |
| 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<br>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](#).

**General Specifications - 5069-0W4I**

| Attribute   | 5069-0W4I  |
|---|--|
| Outputs   | 4 - Form A (normally open)   |
| Voltage and current ratings   |  |
| Output voltage range  | 5...125V DC<br>5...264V AC   |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |
| Module Power bus (MOD Power) current, max                               | 75 mA  |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |
| Sensor Actuator Power bus (SA Power) Passthrough voltage range          | 0...32V DC   |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A   |
| Power dissipation, max  | 2.3 W  |
| Thermal dissipation, max  | 7.85 BTU/hr  |
| Isolation voltage   | 300V (continuous), Basic Insulation Type   |
| Slot width  | 1  |
| Dimensions (HxWxD), approx  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes: <ul style="list-style-type: none"> <li>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)</li> <li>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.)</li> </ul>  |
| RTB   | One of the following 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. |
| Terminal screw torque (5069-RTB18-SCREW)                                | 0.4 N•m (3.5 lb•in)  |
| RTB keying  | None   |
| Wire category <sup>(3)</sup>  | 1 - relay ports<br>2 - power ports<br>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<br>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<br>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)  |

**General Specifications - 5069-0W4I**

| Attribute                | 5069-0W4I |
|--------------------------|-----------|
| North American temp code | T4        |
| ATEX temp code           | T4        |
| IECEx temp code          | T4        |

- (1) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)   |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)   | 5...95% noncondensing  |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)   | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 50 g   |
| Emissions   | IEC 61000-6-4  |
| ESD immunity<br>IEC 61000-4-2   | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC 61000-4-3   | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4   | ±4 kV @ 5 kHz on power ports<br>±4 kV @ 5 kHz on relay ports   |
| Surge transient immunity<br>IEC 61000-4-5   | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±1 kV line-line (DM) and ±2 kV line-earth (CM) on relay ports   |
| Conducted RF immunity<br>IEC 61000-4-6  | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz  |
| Voltage variation<br>IEC 61000-4-29   | 10 ms interruption on MOD Power port   |

**Certifications - 5069-0W4I**

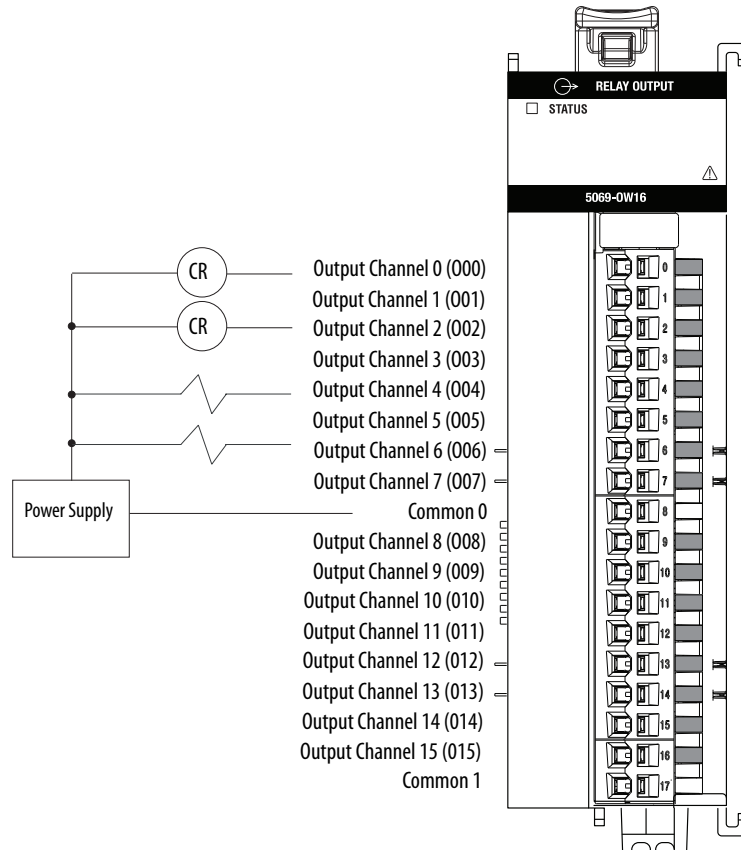
| Certification <sup>(1)</sup> | 5069-0W4I   |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and 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> |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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-OW16 Digital 16-point Relay Output Module

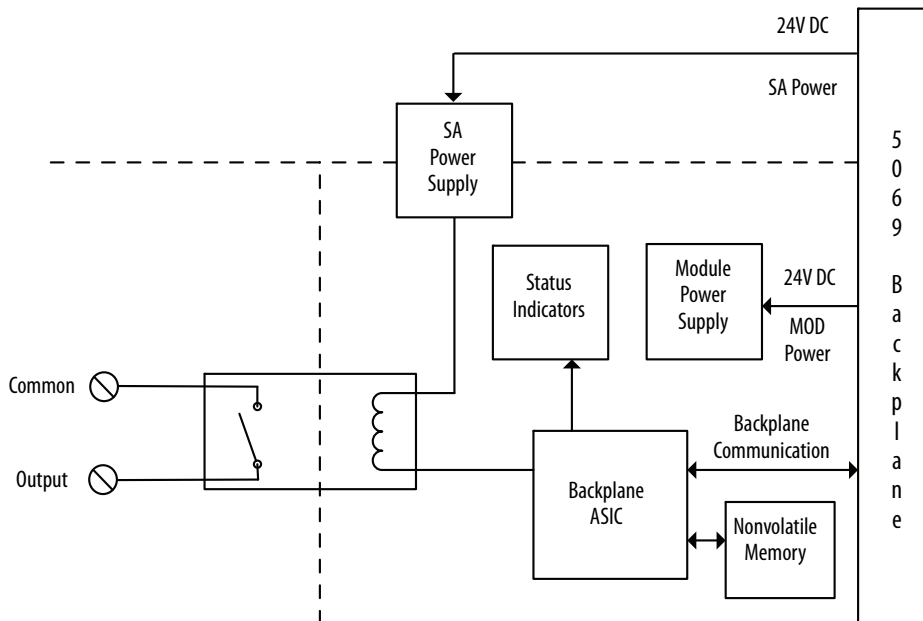
This figure shows a wiring diagram for the 5069-OW16 module.

#### 5069-OW16 Wiring Diagram



This figure shows a functional block diagram for the 5069-OW16 module.

#### 5069-OW16 Functional Block Diagram



**Technical Specifications - 5069-0W16**

| <b>Attribute</b>                         | <b>5069-0W16</b>  |
|--|---|
| Relay ratings                            | 2 A resistive per channel @ 5...30V DC<br>2 A resistive per channel @ 5...264V AC, 50/60 Hz<br>2 A general use per channel @ 5...250V AC, 50/60 Hz<br>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<br>5...125V DC, R150 pilot duty per channel  |
| Increased output current capability      | 16 outputs can be paralleled to increase current capability by 1 A per channel<br>8 outputs can be paralleled to increase current capability by 2 A 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>  |
| 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>  |

**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<br>5...264V AC   |
| MOD Power  | 75 mA @ 18...32V DC  |
| MOD Power (Passthrough) <sup>(1)</sup>   | 9.55 A @ 18...32V DC   |
| SA Power   | 150 mA @ 18...32V DC   |
| SA Power (Passthrough) <sup>(2)</sup>  | 9.95 A @ 18...32V DC   |
| Do not exceed 10 A MOD or SA Power (Passthrough) current draw.<br>The 5069-0W16 module complies with ATEX/IECEx when used at or below 125V AC or 30V DC. |  |
| Power dissipation  | 3.0 W  |
| Thermal dissipation  | 10.2 BTU/hr  |
| Isolation voltage  | 300V (continuous), Basic Insulation Type<br>Type tested at 1800V AC for 60 s<br>No isolation between individual channels   |
| Module keying  | Electronic keying via programming software   |
| Indicators   | 1 green/red module status indicator<br>16 yellow I/O status indicators   |
| Slot width   | 1.5  |
| Dimensions (HxWxD), approx   | 138 x 36 x 105 mm (5.43 x 1.42 x 4.15 in.)   |
| DIN rail   | Compatible zinc-plated, chromate-passivated steel DIN rail.<br>EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)   |
| RTB  | One of the following 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. |
| Terminal screw torque (5069-RTB18-SCREW RTB only)  | 0.4 N·m (3.5 lb-in)  |
| RTB keying   | None   |
| Wire category  | 1 - relay ports<br>2 - power ports<br>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.<br>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.<br>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.)   |



**General Specifications - 5069-0W16**

| Attribute                | 5069-0W16         |
|--------------------------|-------------------|
| 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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

**Environmental Specifications - 5069-0W16**

| Attribute  | 5069-0W16  |
|--|--|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold),<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)   |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing  |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g   |
| Emissions  | IEC 61000-6-4  |
| ESD immunity<br>IEC 61000-4-2  | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC 61000-4-3  | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4  | ±4 kV @ 5 kHz on power ports<br>±3 kV @ 5 kHz on relay ports   |
| Surge transient immunity<br>IEC 61000-4-5  | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±1 kV line-line (DM) and ±2 kV line-earth (CM) on relay ports   |
| Conducted RF immunity<br>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**

| Certification <sup>(1)</sup> | 5069-0W16   |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>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> |
| 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 IICT4 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 IICT4 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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>Russian Customs Union TR CU 004/2011 LV Technical Regulation   |

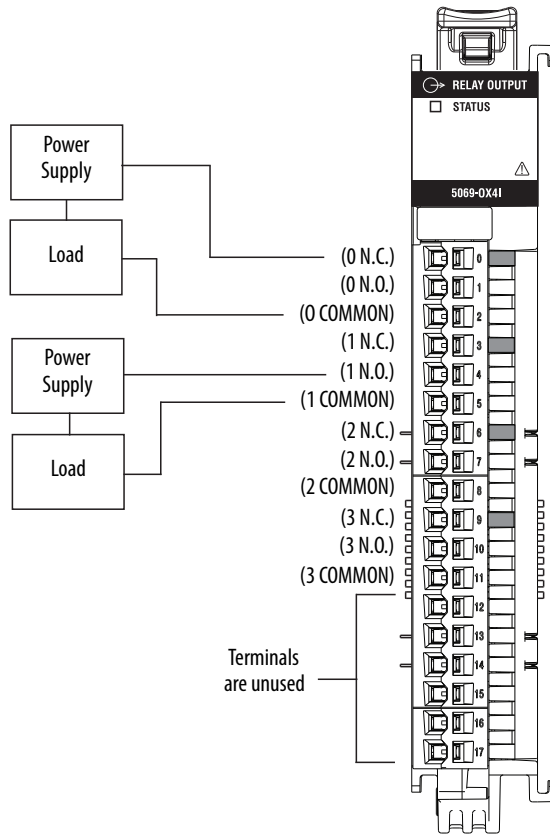
(1) See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

### 5069-OX4I Digital 4-point Isolated Normally-open/Normally-closed Output Module

This figure shows a wiring diagram for the 5069-OX4I module.

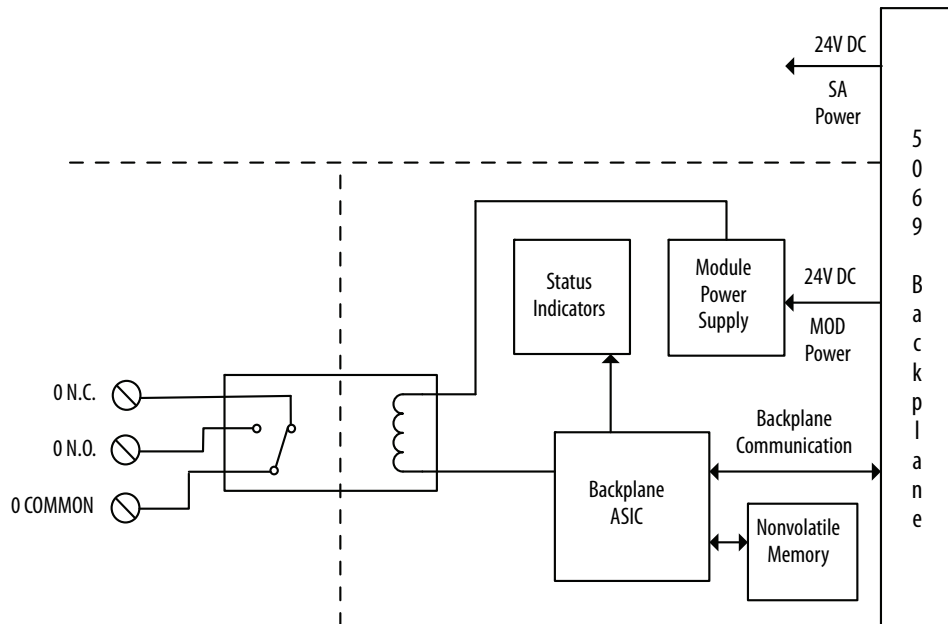
**5069-OX4I Wiring Diagram**

**IMPORTANT:** The 5069-OX4I module does not use SA power. That is, it does not draw current from the SA Power bus. The module passes it through to the next COMPACT 5000 I/O module in the system.



This figure shows a functional block diagram for the 5069-OX4I module.

**5069-OX4I Functional Block Diagram**



**Technical Specifications - 5069-0X4I**

| Attribute  | 5069-0X4I  |
|--|--|
| Contact current rating <sup>(1)</sup>            | 5...30V DC, 2 A resistive/channel<br>5...264V AC, 50/60 Hz, 2 A resistive/channel<br>5...250V AC, 50/60 Hz, 2 A general use/channel<br>5...125V AC, 50/60 Hz, 2 A ATEX/IECEX<br>8 A maximum per module |
| Off-state leakage                                | 0 mA (dry contact, no onboard snubbers)  |
| Output current rating                            | 2 A per channel<br>8 A per module, max   |
| Output delay time, max<br>Off to On<br>On to Off | 15 ms<br>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>   |
| 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<br>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](#).

**General Specifications - 5069-0X4I**

| Attribute   | 5069-0X4I  |
|---|--|
| Outputs   | 4 - Form C (SPDT)  |
| Voltage and current ratings   |  |
| Output voltage range  | 5...125V DC<br>5...264V AC   |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |
| Module Power bus (MOD Power) current, max                               | 75 mA  |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |
| Sensor Actuator Power bus (SA Power) Passthrough voltage range          | 0...32V DC   |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A   |
| Power dissipation, max  | 2.6 W  |
| Thermal dissipation, max  | 8.88 BTU/hr  |
| Isolation voltage   | 300V (continuous), Basic Insulation Type   |
| Slot width  | 1  |
| Dimensions (HxWxD), approx  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes: <ul style="list-style-type: none"> <li>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)</li> <li>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.)</li> </ul>  |
| RTB   | One of the following 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. |
| Terminal screw torque (5069-RTB18-SCREW)                                | 0.4 N•m (3.5 lb•in)  |
| RTB keying  | None   |
| Wire category <sup>(3)</sup>  | 1 - relay ports<br>2 - power ports<br>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<br>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<br>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.)   |

**General Specifications - 5069-0X4I**

| Attribute                | 5069-0X4I         |
|--------------------------|-------------------|
| 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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)   |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat):  | 5...95% noncondensing  |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)   | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 50 g   |
| Emissions   | IEC 61000-6-4  |
| ESD immunity<br>IEC 61000-4-2   | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC 61000-4-3   | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4   | ±4 kV @ 5 kHz on power ports<br>±4 kV @ 5 kHz on relay ports   |
| Surge transient immunity<br>IEC 61000-4-5   | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±1 kV line-line (DM) and ±2 kV line-earth (CM) on relay ports   |
| Conducted RF immunity<br>IEC 61000-4-6  | 10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz   |
| Voltage variation<br>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.<br>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> |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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

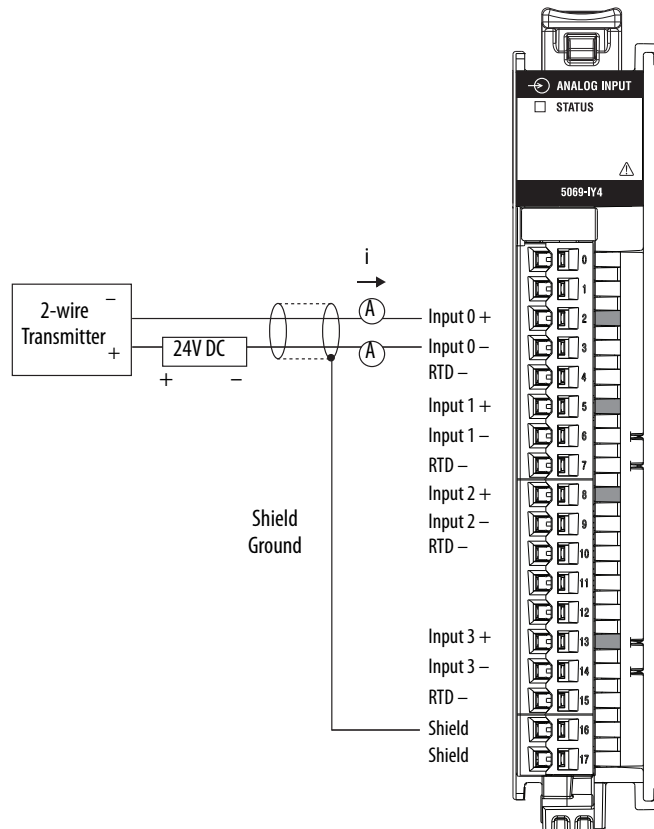
| I/O Type      | Cat. No.             | Page |
|---------------|----------------------|------|
| Analog input  | 5069-IY4             | 48   |
|               | 5069-IF8             | 58   |
| Analog output | 5069-OF4<br>5069-OF8 | 64   |

### 5069-IY4 Analog Input Module

This figure shows a wiring diagram for the 5069-IY4 module when used in current mode.

#### 5069-IY4 Wiring Diagram - Current Mode

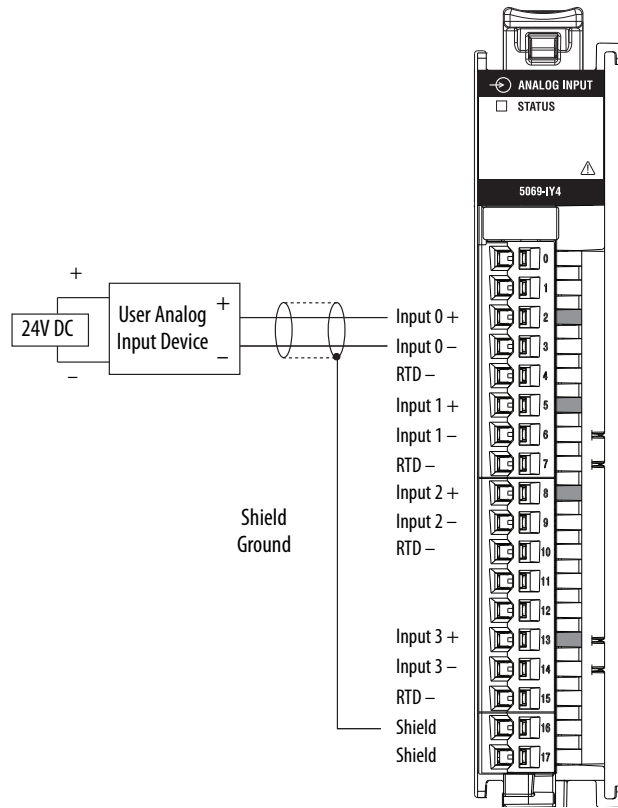
Place additional loop devices, for example, strip chart recorders, at either **A** location in the current loop.





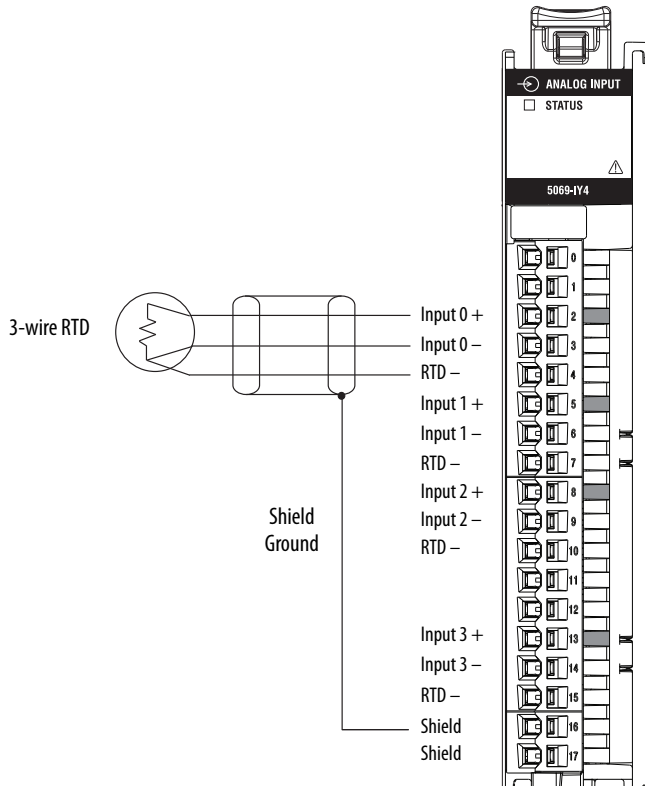
This figure shows a wiring diagram for the 5069-IY4 module when used in voltage mode.

**5069-IY4 Wiring Diagram - Voltage Mode**



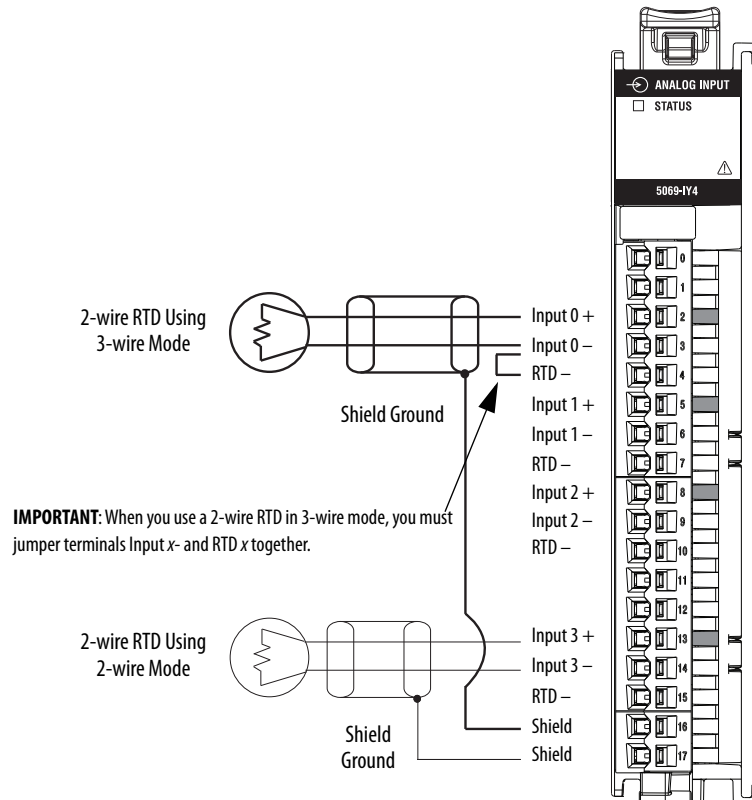
This figure shows a wiring diagram for the 5069-IY4 module when used in 3-wire RTD mode.

**5069-IY4 Wiring Diagram - 3-wire RTD**



This figure shows a wiring diagram for the 5069-IY4 module when used in 2-wire RTD mode.

**5069-IY4 Wiring Diagram - 2-wire RTD**

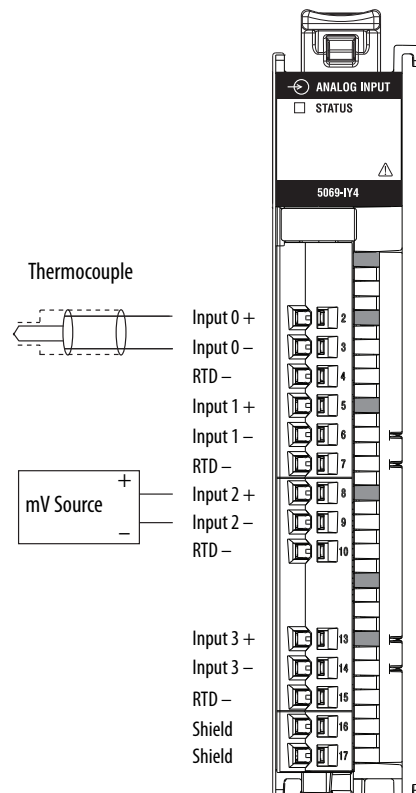


This figure shows a wiring diagram for the 5069-IY4 module when used in thermocouple mode.

**5069-IY4 Wiring Diagram - Thermocouple Input**

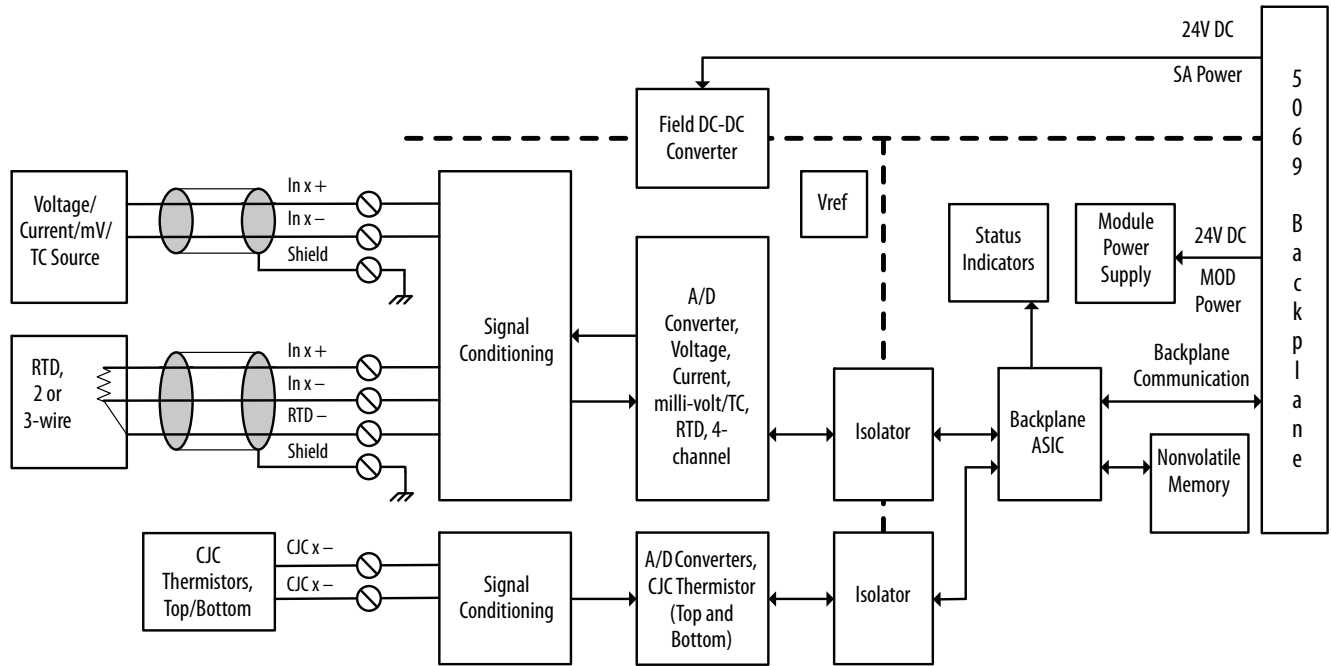
**IMPORTANT:** When you use the 5069-IY4 analog input module in Thermocouple mode, you must use one of the following CJC type RTBs:

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



This figure shows a functional block diagram for the 5069-IY4 module.

**5069-IY4 Functional Block Diagram**



**Technical Specifications - 5069-IY4**

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

**Technical Specifications - 5069-IY4**

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

**Technical Specifications - 5069-IY4**

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

**Technical Specifications - 5069-IY4**

| Attribute  | 5069-IY4   |
|--|--|
| CJC inputs<br>(for thermocouple mode use only)                                     | Two CJC sensors<br>2 thermistors embedded in 5069-RTB14CJC-(SCREW or SPRING) RTB<br>-or-<br>2 thermistors wired to 5069-RTB18-(SCREW or SPRING) RTB<br>Thermistor type:<br>Measurement Specialties, Inc. 10K3A1A |
| Local CJC sensor accuracy  | ± 0.3 °C   |
| Remote CJC sensor accuracy<br>(Based on specified thermistor)                      | ± 0.3 °C   |
| Calibrated accuracy at 25 °C   | Voltage 0.100% full scale<br>Current 0.100% full scale<br>RTD 0.100% full scale<br>Thermocouple/millivolt 0.100% full scale  |
| Accuracy drift with temperature  | Voltage 0.200% full scale<br>Current 0.300% full scale<br>RTD 0.200% full scale<br>Thermocouple/millivolt 0.200% full scale  |
| Input Total Unadjusted Error (TUE) <sup>(2)</sup><br>(Over full temperature range) | Voltage 0.300% Full Scale<br>Current 0.400% Full Scale<br>RTD 0.300% Full Scale<br>Thermocouple/millivolt 0.300% Full Scale  |
| Scan time<br>• Per channel<br>• Per group (channel group 0 . . . 3)                | 625 µs<br>2.5 ms   |
| Notch filter at minimum RPI<br>(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<br>(Notch filter 10 kHz)                        | 7.5 ms   |
| Input notch filter (Hz) selections   | 5, 10 (50/60 default), 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   | 1st Order Lag,<br>0 ms (Default) - 10,000 ms (10 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:<br>± 30V DC  |
| Overcurrent protection, max  | Current mode: ± 30 mA  |
| Data value during overload condition   | Full scale, overrange flag,<br>Data uncertain / data bad   |
| Open circuit detection time, nom   | Voltage: + full scale, < 2 s<br>Current: 4 . . . 20 mA range, <2 s<br>RTD: <2 s<br>Thermocouple / millivolt: + full scale, <10 s   |
| Onboard data alarming  | Yes  |

**Technical Specifications - 5069-IY4**

| Attribute                    | 5069-IY4                   |
|------------------------------|----------------------------|
| 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**

| Attribute   | 5069-IY4   |
|---|--|
| Voltage and current ratings   |  |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |
| Module Power bus (MOD Power) current, max                               | 75 mA  |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |
| Sensor Actuator (SA) Field Power voltage range                          | 18...32V DC  |
| Sensor Actuator (SA) Field Power current, max                           | 100 mA   |
| Sensor Actuator Power bus (SA Power) Passthrough voltage range          | 0...32V DC   |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A   |
| Power dissipation, max  | Voltage mode: 1.8 W<br>Current mode: 2.1 W<br>RTD mode: 2.1 W<br>Thermocouple / millivolt mode: 1.8 W  |
| Thermal dissipation, max  | Voltage mode: 6.1 BTU/hr<br>Current mode: 7.2 BTU/hr<br>RTD mode: 7.2 BTU/hr<br>Thermocouple/millivolt: 6.1 BTU/hr   |
| Isolation voltage   | 300V (continuous), Basic Insulation Type<br>50V Functional Isolation between SA Power and input ports<br>No isolation between individual input ports                                       |
| Calibration methods   | Factory calibrated<br>User-performed (optional)  |
| Module keying   | Electronic, software configurable  |
| Indicators  | 1 green/red module status indicator<br>4 yellow/red I/O status indicators<br>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  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes:<br>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)<br>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.) |

**General Specifications - 5069-IY4**

| Attribute  | 5069-IY4  |
|--|---|
| RTB  | One of the following 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. |
| Terminal screw torque<br>(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<br>2 - power ports<br>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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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**

| Attribute  | 5069-IY4                     |
|--|------------------------------|
| Temperature, operating<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing        |



**Environmental Specifications - 5069-IY4**

| Attribute   | 5069-IY4   |
|---|--|
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)                   | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)    | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g   |
| Emissions   | IEC 61000-6-4  |
| ESD immunity<br>IEC 61000-4-2                                     | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC 61000-4-3                             | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4                                   | ±4 kV @ 5 kHz on power ports<br>±3 kV @ 5 kHz on shielded input ports  |
| Surge transient immunity<br>IEC 61000-4-5                         | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±2 kV line-earth (CM) on shielded input ports   |
| Conducted RF immunity<br>IEC 61000-4-6                            | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz  |
| Voltage variation<br>IEC 61000-4-29                               | 10 ms interruption on MOD Power port   |

**Certifications - 5069-IY4**

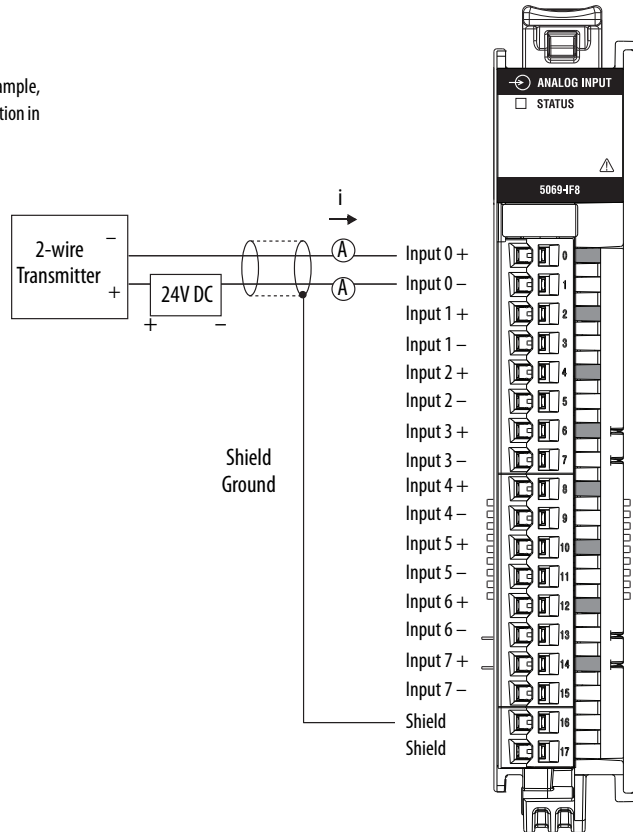
| Certification <sup>(1)</sup> | 5069-IY4  |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.  |
| CE                           | European Union 2014/30/EU EMC Directive, compliant with:<br><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:<br><ul style="list-style-type: none"> <li>EN 61010-2-201; Control Equipment Safety Requirements</li> </ul> |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>EN 61000-6-4; Industrial Emissions   |
| Ex                           | European Union 2014/34/EU ATEX Directive, compliant with:<br><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:<br><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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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-IF8 Analog 8-channel Current/Voltage Input Module

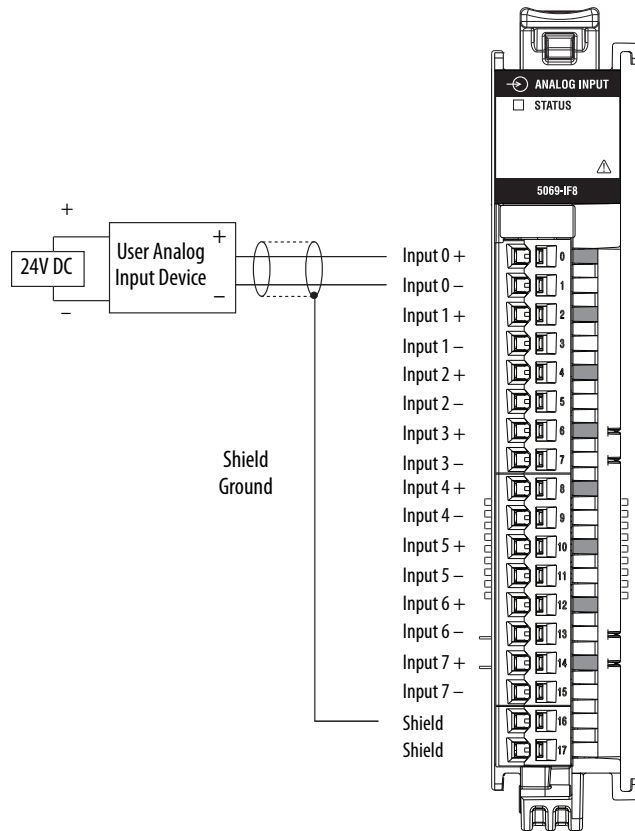
This figure shows a wiring diagram for the 5069-IF8 module when used in current mode.  
**5069-IF8 Wiring Diagram - Current Mode**

Place additional loop devices, for example, strip chart recorders, at either A location in the current loop.



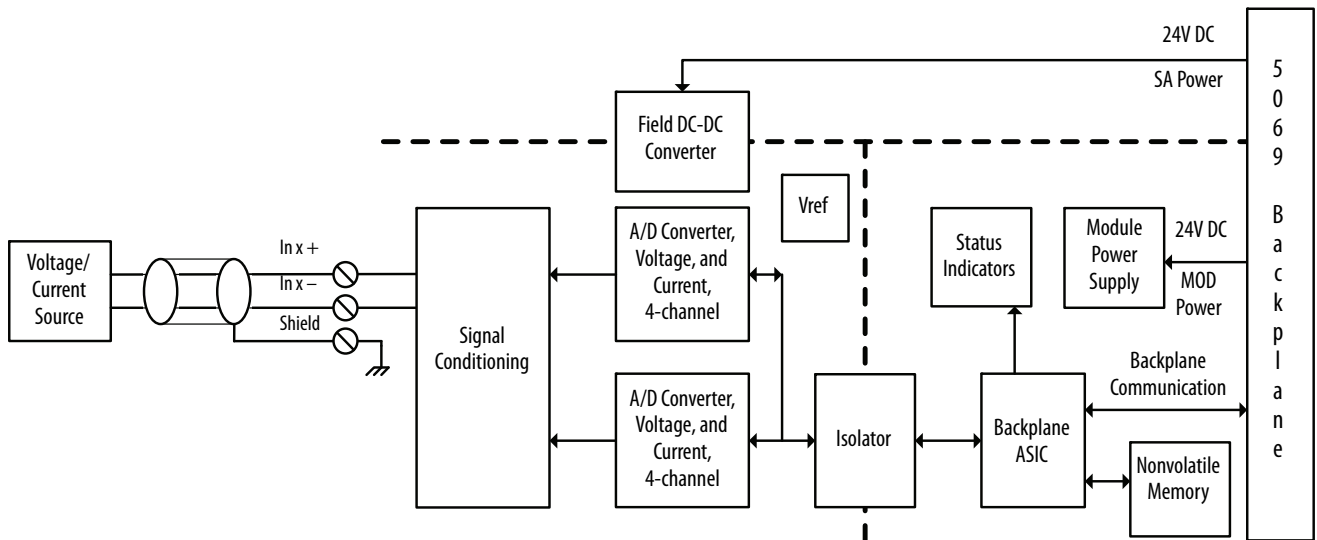
This figure shows a wiring diagram for the 5069-IF8 module when used in voltage mode.

**5069-IF8 Wiring Diagram - Voltage Mode**



This 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<br>0...10V<br>0...5V   |
| Input range, current   | 0...20 mA<br>4...20 mA  |
| Input impedance  | Voltage: >1 MΩ<br>Current: 90 Ω typical, 70...110 Ω range   |
| Common mode voltage (channel to channel)   | ±10V  |
| Module conversion method   | Sigma-Delta,<br>Two 24-bit multiplexed ADC  |
| Resolution, voltage <sup>(1)</sup><br>(16 bits at 10 Hz notch filter)              | ±10.5V: <320 μV/count<br>(15 bits plus sign bipolar)<br>0...10.5V: <160 μV/count<br>(16 bits unipolar)<br>0...5.25V: <80 μV/count<br>(16 bits unipolar) |
| Resolution, current <sup>(1)</sup><br>(16 bits at 10 Hz notch filter)              | 0...21 mA: <0.32 μA/count<br>(16 bits)<br>3.6...21 mA: <0.27 μA/count<br>(16 bits)  |
| Calibrated accuracy at 25 °C   | Voltage 0.100% full scale<br>Current 0.100% full scale  |
| Accuracy drift with temperature  | Voltage 0.200% full scale<br>Current 0.300% full scale  |
| Input Total Unadjusted Error (TUE) <sup>(2)</sup><br>(Over full temperature range) | Voltage 0.300% Full Scale<br>Current 0.400% Full Scale  |
| Scan Time<br>Per channel<br>Per group (channel group 0...3 or channel group 4...7) | 625 μs<br>2.5 ms  |
| Notch filter at minimum RPI<br>(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<br>(Notch filter 10 kHz)                        | 7.5 ms  |
| Input notch filter (Hz) selections   | 5, 10 (50/60 Default), 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   | 1st order lag,<br>0 ms (Default) - 10,000 ms (10 s)   |
| HART handheld compliance   | Add an external 250 Ω resistor into the current loop for HART transmitter compliance.   |
| Overvoltage protection, max  | Voltage and Current modes:<br>± 30V DC  |
| Overcurrent protection, max  | Current mode: ±30 mA  |
| Data value during overload condition   | Full scale, overrange flag,<br>Data uncertain / data bad  |

**Technical Specifications - 5069-IF8**

| Attribute                    | 5069-IF8   |
|------------------------------|--|
| Open circuit detection time  | Voltage: + full scale, < 2 s<br>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   |  |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |
| Module Power bus (MOD Power) current, max                               | 75 mA  |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |
| Sensor Actuator (SA) Field Power voltage range                          | 18...32V DC  |
| Sensor Actuator (SA) Field Power current, max                           | 100 mA   |
| Sensor Actuator Power bus (SA Power) Passthrough voltage range          | 0...32V DC   |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A   |
| Power dissipation, max  | Voltage mode: 2.1 W<br>Current mode: 2.4 W   |
| Thermal dissipation, max  | Voltage mode: 7.2 BTU/hr<br>Current mode: 8.2 BTU/hr   |
| Isolation voltage   | 300V (continuous), Basic Insulation Type<br>50V Functional Isolation between SA power and input ports<br>No isolation between individual Input ports                                       |
| Calibration methods   | Factory calibrated<br>User-performed (optional)  |
| Module keying   | Electronic, software configurable  |
| Indicators  | 1 green/red module status indicator<br>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  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes:<br>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)<br>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.) |

**General Specifications - 5069-IF8**

| Attribute                                  | 5069-IF8   |
|--|--|
| RTB  | One of the following 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. |
| Terminal screw torque (5069-RTB18-SCREW)   | 0.4 N·m (3.5 lb-in)  |
| RTB keying                                 | None   |
| Wire category <sup>(3)</sup>               | 2 - shielded input ports<br>2 - power ports<br>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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing        |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz          |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g                         |

**Environmental Specifications - 5069-IF8**

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

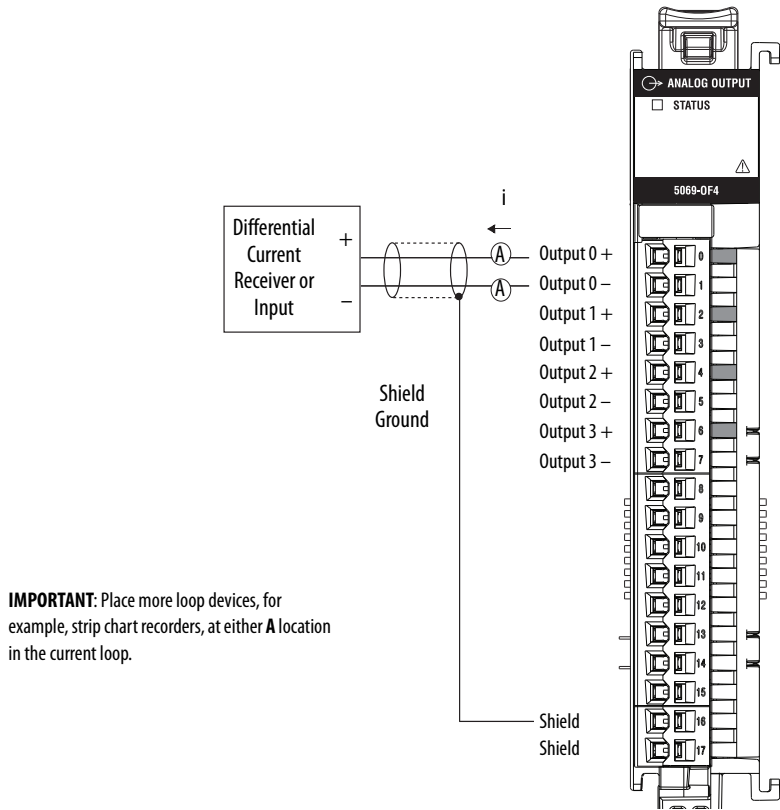
**Certifications - 5069-IF8**

| Certification <sup>(1)</sup> | 5069-IF8  |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>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> |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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 and 5069-OF8 Analog Current/Voltage Output Modules

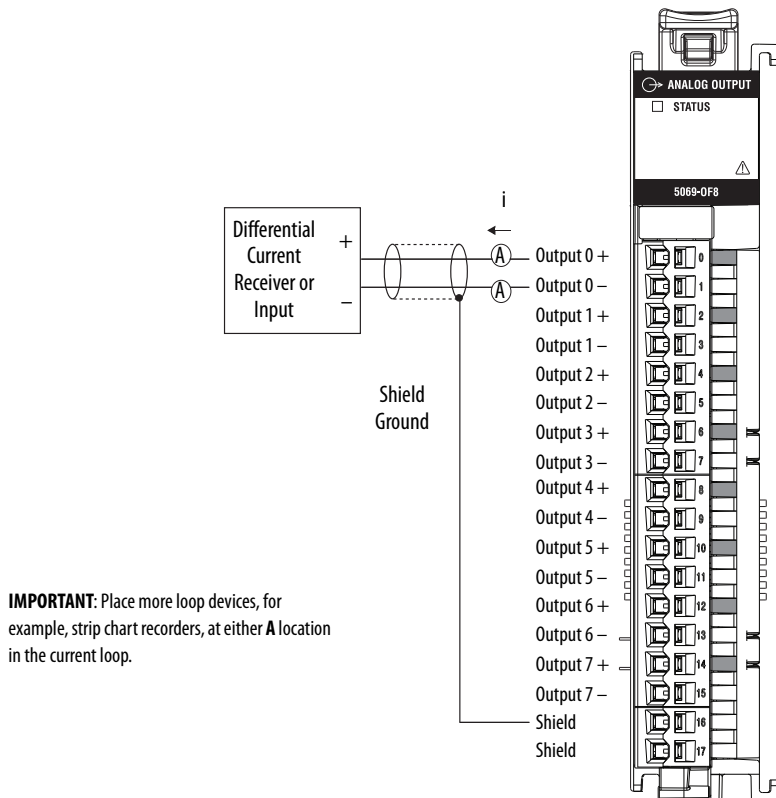
This figure shows a wiring diagram for the 5069-OF4 module when used in current mode.  
**5069-OF4 Wiring Diagram - Current Mode**





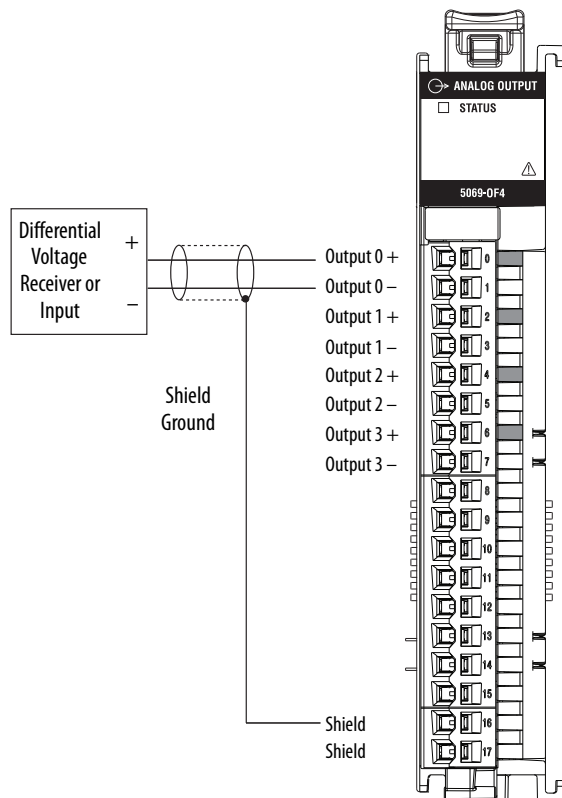
This figure shows a wiring diagram for the 5069-OF8 module when used in current mode.

**5069-OF8 Wiring Diagram - Current Mode**



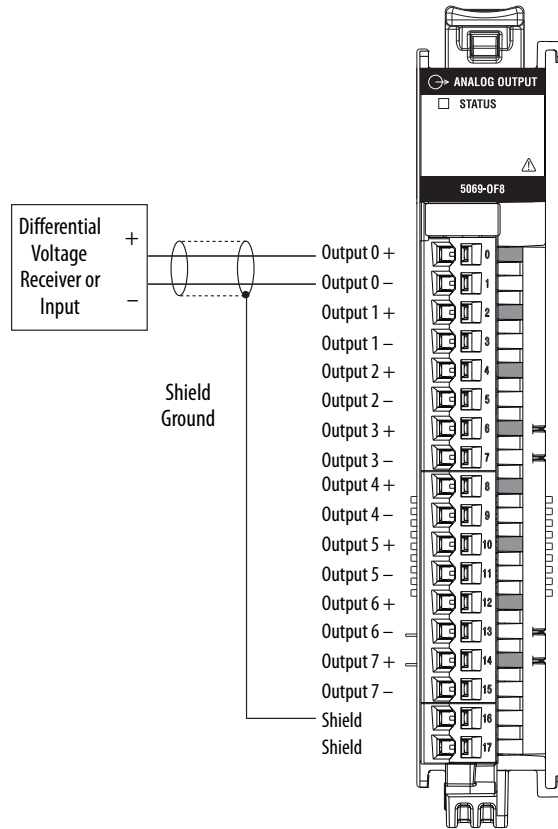
This figure shows a wiring diagram for the 5069-OF4 module when used in voltage mode.

**5069-OF4 Wiring Diagram - Voltage Mode**



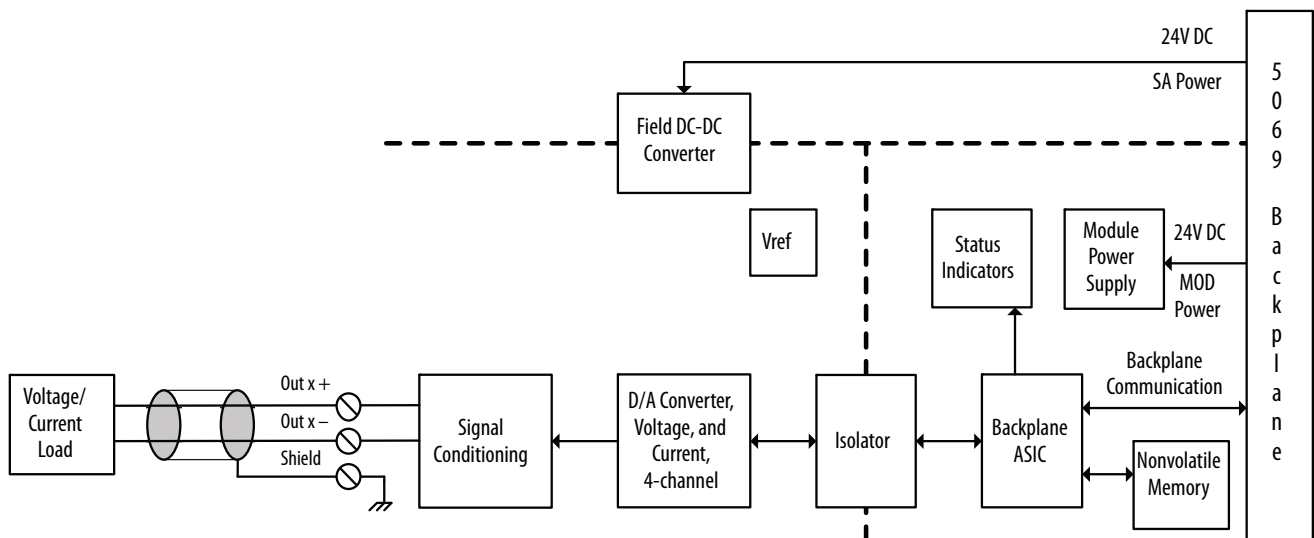
This figure shows a wiring diagram for the 5069-OF8 module when used in voltage mode.

**5069-OF8 Wiring Diagram - Voltage Mode**



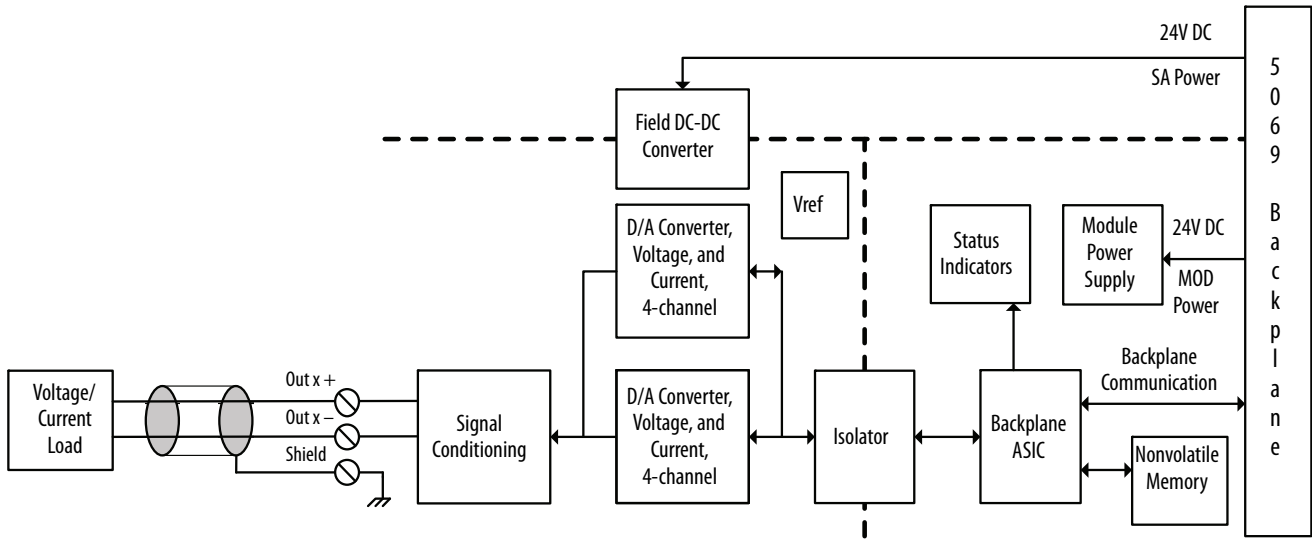
This figure shows a functional block diagram for the 5069-OF4 module.

**5069-OF4 Functional Block Diagram**



This figure shows a functional block diagram for the 5069-OF8 module.

**5069-OF8 Functional Block Diagram**



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

| Attribute                                | 5069-OF4  | 5069-OF8             |
|--|---|----------------------|
| Outputs                                  | 4 voltage or current  | 8 voltage or current |
| Output range, voltage                    | ± 10V<br>0...10V<br>0...5V  |                      |
| Output range, current                    | 0...20 mA<br>4...20 mA  |                      |
| Resolution                               | 16 bits across ± 10.5V - 320 µV/bit<br>16 bits across 10.5V - 160 µV/bit<br>16 bits across 5.25V - 80 µV/bit<br>16 bits across 21 mA - 320 nA/bit |                      |
| Drive capability                         | Voltage - 1000 Ω min<br>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)              | 1.0 ms  |                      |
| • Per group 0...7 (OF8 only)             | 2.0 ms  |                      |
| Step response time to 63% of value       | Voltage mode – 18 µs max<br>Current mode – 1 ms max   |                      |
| Overvoltage protection, max              | 32V DC  |                      |

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

| Attribute                            | 5069-OF4   | 5069-OF8 |
|--------------------------------------|--|----------|
| Repeatability                        | 0.05%  |          |
| Calibrated accuracy at 25 °C (77 °F) | Voltage - 0.10% full scale<br>Current - 0.10% full scale |          |
| Accuracy drift with temperature      | Voltage - 0.30% full scale<br>Current - 0.50% full scale |          |

**General Specifications - 5069-OF4, 5069-OF8**

| Attribute   | 5069-OF4   | 5069-OF8  |
|---|--|---|
| Voltage and current ratings   |  |   |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |   |
| Module Power bus (MOD Power) current, max                               | 75 mA  |   |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |   |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |   |
| Sensor Actuator (SA) Field Power voltage range                          | 18...32V DC  |   |
| Sensor Actuator (SA) Field Power current, max                           | 150 mA   | 250 mA  |
| Sensor Actuator Power bus (SA Power) Passthrough voltage range          | 18...32V DC  |   |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A   |   |
| Power dissipation, max  | 3.3 W  | 5.3 W   |
| Thermal dissipation, max  | 11.3 BTU/hr  | 18.1 BTU/hr   |
| Isolation voltage   | 300V (continuous), Basic Insulation Type<br>50V Functional Isolation between SA power and output ports<br>No isolation between individual output ports   |   |
| Calibration methods   | Factory Calibrated<br>User-performed (optional)  |   |
| Module keying   | Electronic, software configurable  |   |
| Indicators  | 1 green/red module status indicator<br>4 yellow/red I/O status indicators  | 1 green/red module status indicator<br>8 yellow/red I/O status indicators |
| Slot width  | 1  |   |
| Dimensions (HxWxD), approx  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |   |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes:<br>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)<br>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.)   |   |
| RTB   | One of the following RTB types.<br>• 5069-RTB18-SPRING RTB<br>• 5069-RTB18-SCREW RTB<br><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. |   |
| Terminal screw torque (5069-RTB18-SCREW)                                | 0.4 N•m (3.5 lb-in)  |   |
| RTB keying  | None   |   |

**General Specifications - 5069-OF4, 5069-OF8**

| Attribute                                  | 5069-OF4  | 5069-OF8 |
|--|---|----------|
| Wire category <sup>(3)</sup>               | 2 - shielded input ports<br>2 - power ports<br>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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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-OF4, 5069-OF8**

| Attribute  | 5069-OF4, 5069-OF8           |
|--|------------------------------|
| Temperature, operating<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing        |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz          |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g                         |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g                         |
| Emissions  | IEC 61000-6-4                |

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

| Attribute                                 | 5069-OF4, 5069-OF8  |
|---|---|
| ESD immunity<br>IEC 61000-4-2             | 6 kV contact discharges<br>8 kV air discharges  |
| Radiated RF immunity<br>IEC 61000-4-3     | 10V/m with 1 kHz sine-wave 80% AM from 80 . . . 200 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000 . . . 2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4           | ±4 kV @ 5 kHz on power ports<br>±3 kV @ 5 kHz on shielded output ports  |
| Surge transient immunity<br>IEC 61000-4-5 | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±2 kV line-earth (CM) on shielded output ports   |
| Conducted RF immunity<br>IEC 61000-4-6    | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz . . . 80 MHz   |
| Voltage variation<br>IEC 61000-4-29       | 10 ms interruption on MOD Power port  |

**Certifications - 5069-OF4, 5069-OF8**

| Certification <sup>(1)</sup> | 5069-OF4, 5069-OF8  |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>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> |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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.

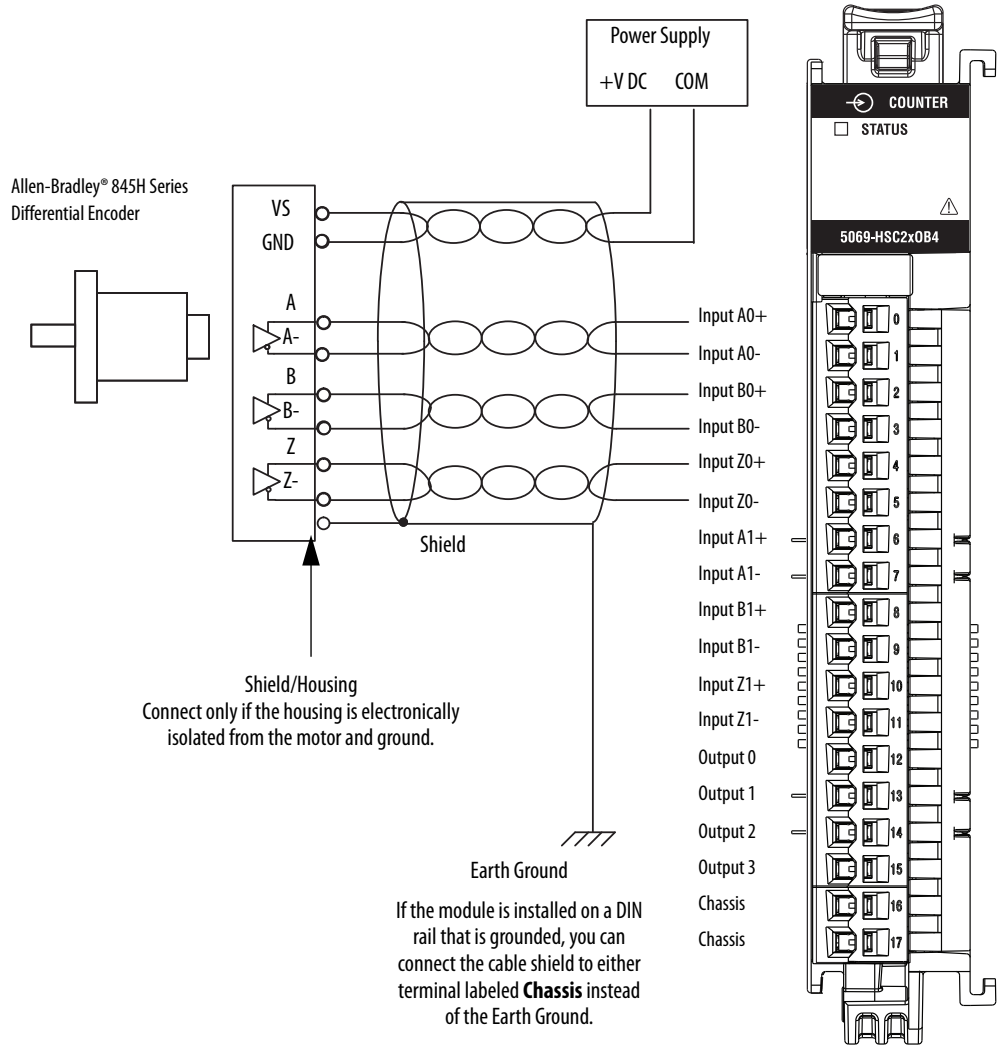
## 5069-HSC2xOB4 High-speed Counter Module

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

### 5069-HSC2xOB4 Wiring Diagram - Differential Encoder

**IMPORTANT:** We recommend that you use twisted pair, individually shielded cable with a maximum length of 300 m (1000 ft) when connecting a differential encoder.

For more information on the cable type to use, see the encoder documentation.

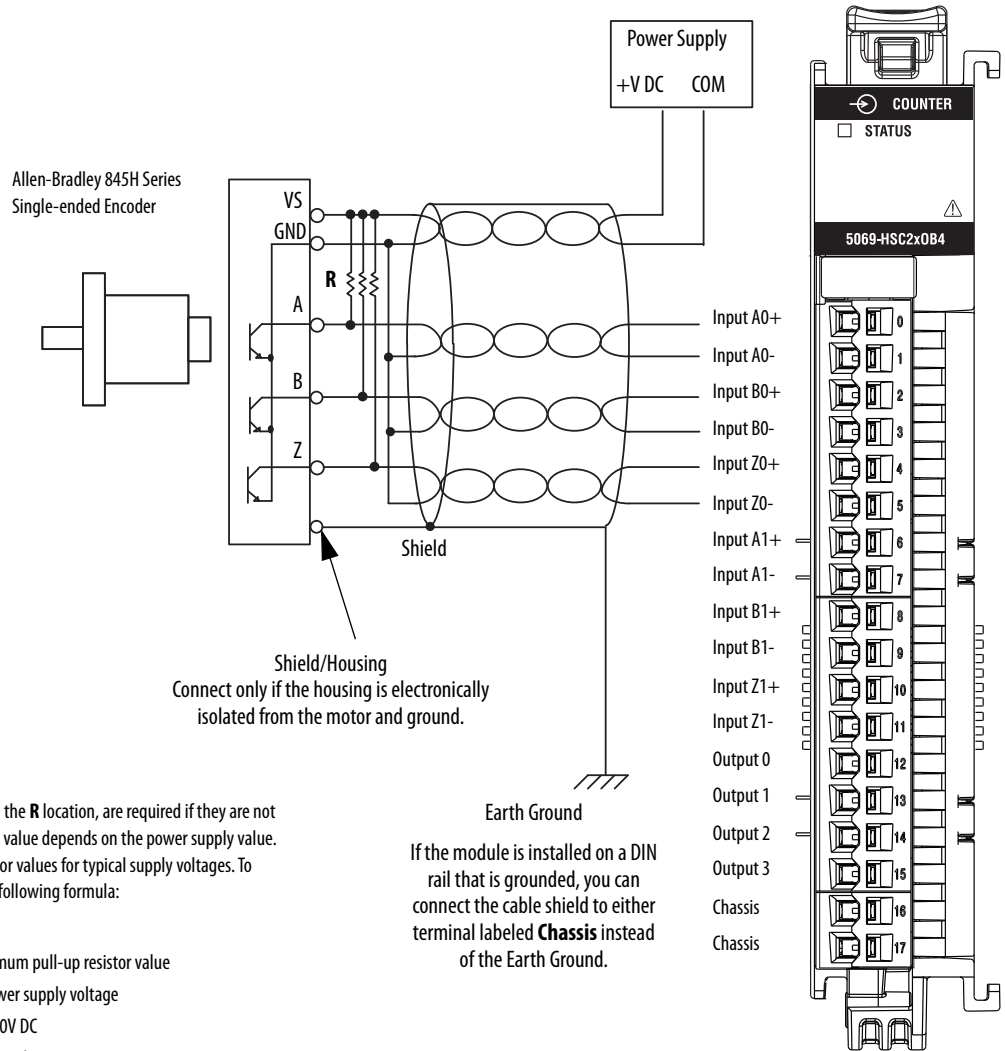


This figure shows a wiring diagram for the 5069-HSC2xOB4 module connected to a single-ended encoder.

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

**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 the following formula:

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

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

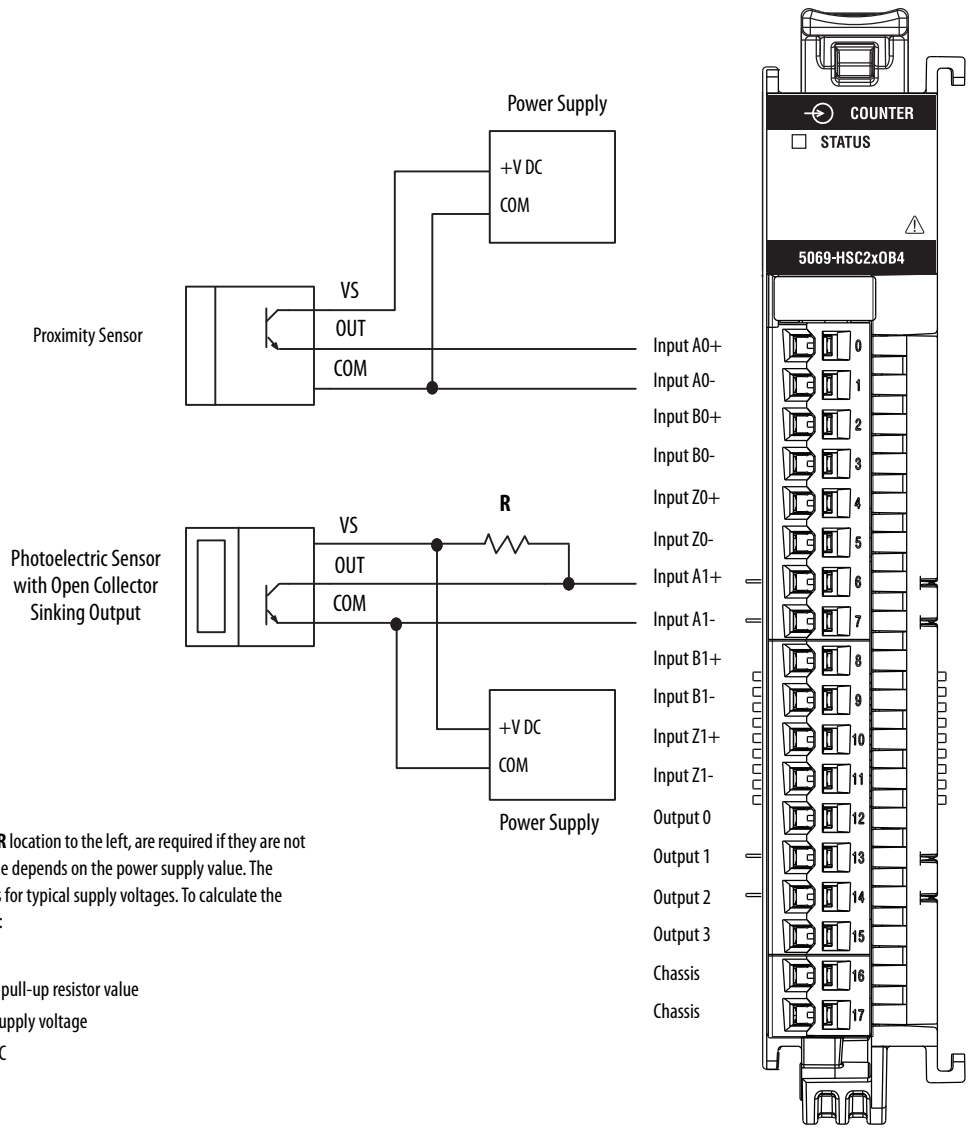
| Power Supply Voltage (V DC) | Pull-up Resistor Value (R), Max <sup>(1)</sup> |
|-----------------------------|--|
| 5                           | 667 Ω  |
| 12                          | 3000 Ω   |
| 24                          | 7000 Ω   |

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



This figure shows a wiring diagram for the 5069-HSC2xOB4 module connected to a discrete input device.

**5069-HSC2xOB4 Wiring Diagram - Discrete Input Devices**



**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 the following formula:

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

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

| Power Supply Voltage (V DC) | Pull-up Resistor Value (R), Max <sup>(1)</sup> |
|-----------------------------|--|
| 5                           | 667 Ω  |
| 12                          | 3000 Ω   |
| 24                          | 7000 Ω   |

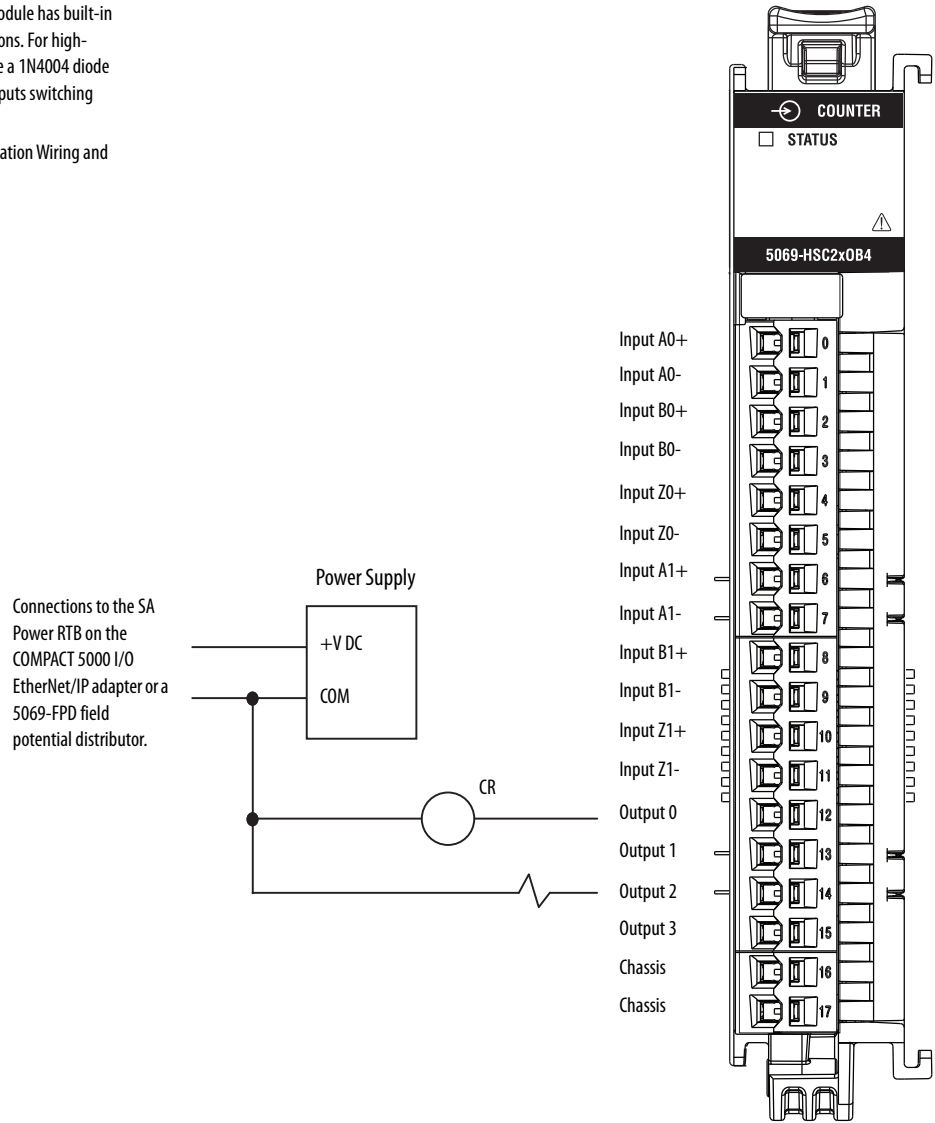
(1) Resistance values can change, depending on your application. The minimum resistor (R) value depends on the current sinking capability of the encoder.

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

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

**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](#).

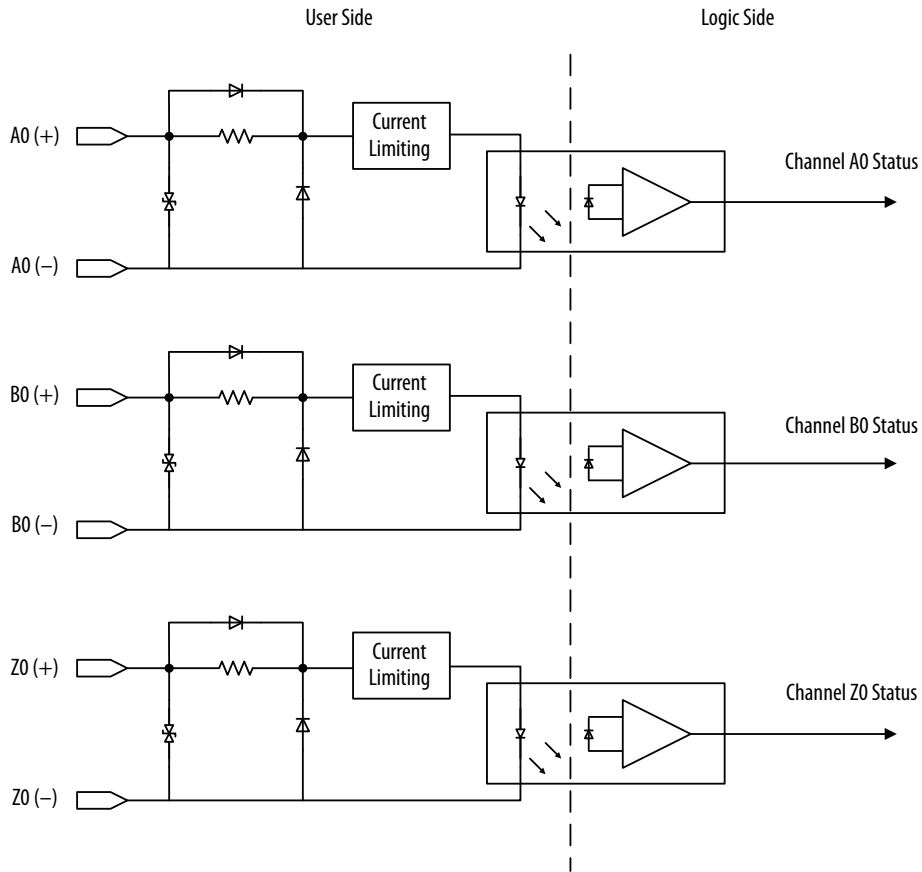


This figure shows functional block diagrams for the 5069-HSC2xOB4 module inputs and outputs.

**5069-HSC2xOB4 Functional Block Diagram**

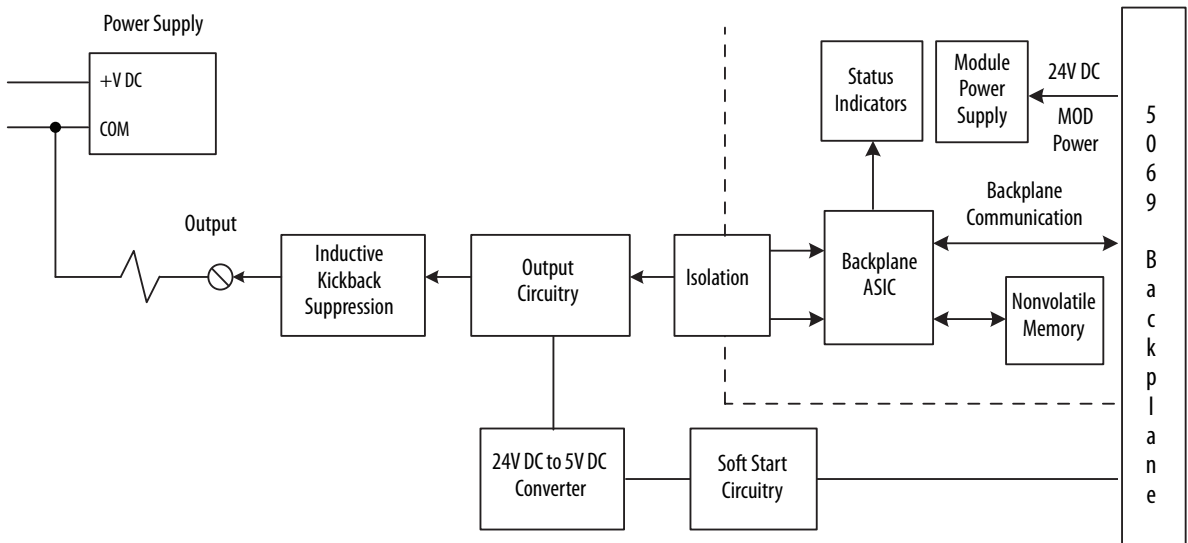
**Module Inputs**

**IMPORTANT:** This graphic shows the diagram for Counter 0. Counter 1 uses the same design.



**Module Outputs**

Connections to the SA Power RTB on the COMPACT 5000 I/O EtherNet/IP adapter or a 5069-FPD field potential distributor.



**Technical Specifications - 5069-HSC2x0B4**

| <b>Attribute</b>                                 | <b>5069-HSC2x0B4</b>   |
|--|--|
| 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   |
| Input current, max                               | 8 mA   |
| Output current rating                            | 1 A per channel<br>3 A per module, max   |
| Pulse width, min                                 | 125 ns   |
| Pulse separation, min                            | 100 ns   |
| Open 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)  |
| Increased output current capability              | Outputs can be paralleled to increase current capability by 1 A per channel.<br>Total current per module is limited to 3 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> |
| CIP sync   | Supported  |

**General Specifications - 5069-HSC2x0B4**

| <b>Attribute</b>  | <b>5069-HSC2x0B4</b>   |
|---|--|
| Inputs  | 2 quadrature (ABZ) differential inputs   |
| Outputs   | 4 Channels (1 group of 4), sourcing  |
| Voltage category  | 12/24V DC source   |
| Voltage and current ratings   |  |
| Input range, voltage  | 3...32V DC   |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |
| Module Power bus (MOD Power) current, max                               | 50 mA  |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |
| Sensor Actuator (SA) Field Power voltage range                          | 18...32V DC  |
| Sensor Actuator (SA) Field Power current, max                           | 3 A  |
| Sensor Actuator Power bus (SA Power) Passthrough voltage range          | 18...32V DC  |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A   |
| Power dissipation, max  | 3 W  |
| Thermal dissipation, max  | 10.2 BTU/hr  |
| Isolation voltage   | 300V (continuous), Basic Insulation Type<br>No isolation between SA Power and I/O ports<br>No isolation between individual I/O ports<br>Type tested at 1500V AC for 60 s   |
| Module keying   | Electronic, software configurable  |
| Indicators  | 1 green/red module status indicator<br>10 yellow/red I/O status indicator  |
| Slot width  | 1  |
| Dimensions (HxWxD), approx  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)   |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes: <ul style="list-style-type: none"> <li>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)</li> <li>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.)</li> </ul>  |
| RTB   | One of the following 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 keying  | None   |
| Terminal screw torque (5069-RTB18-SCREW)                                | 0.4 N•m (3.5 lb•in)  |
| Wiring category <sup>(3)</sup>  | 2 - on shielded output ports<br>2 - on output power ports<br>2 - on shielded counter ports   |

**General Specifications - 5069-HSC2x0B4**

| Attribute                     | 5069-HSC2x0B4  |
|-------------------------------|--|
| 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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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**

| Attribute  | 5069-HSC2x0B4  |
|--|--|
| Temperature, operating<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)   |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95 % noncondensing   |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g   |
| Emissions  | IEC 61000-6-4  |
| ESD immunity<br>IEC 61000-4-2  | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC 61000-4-3  | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |

**Environmental Specifications - 5069-HSC2x0B4**

| Attribute                                 | 5069-HSC2x0B4  |
|---|--|
| EFT/B immunity<br>IEC 61000-4-4           | ±4 kV @ 5 kHz on power ports<br>±2 kV @ 5 kHz on shielded output ports<br>±2 kV @ 5 kHz on shielded counter ports  |
| Surge transient immunity<br>IEC 61000-4-5 | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±2 kV line-earth (CM) on shielded output ports<br>±2 kV line-earth (CM) on shielded counter ports |
| Conducted RF immunity<br>IEC 61000-4-6    | 10Vrms with 1 kHz sine-wave 80% AM from 150 kHz... 80 MHz  |
| Voltage variation<br>IEC 61000-4-29:      | 10 ms interruption on MOD Power port   |

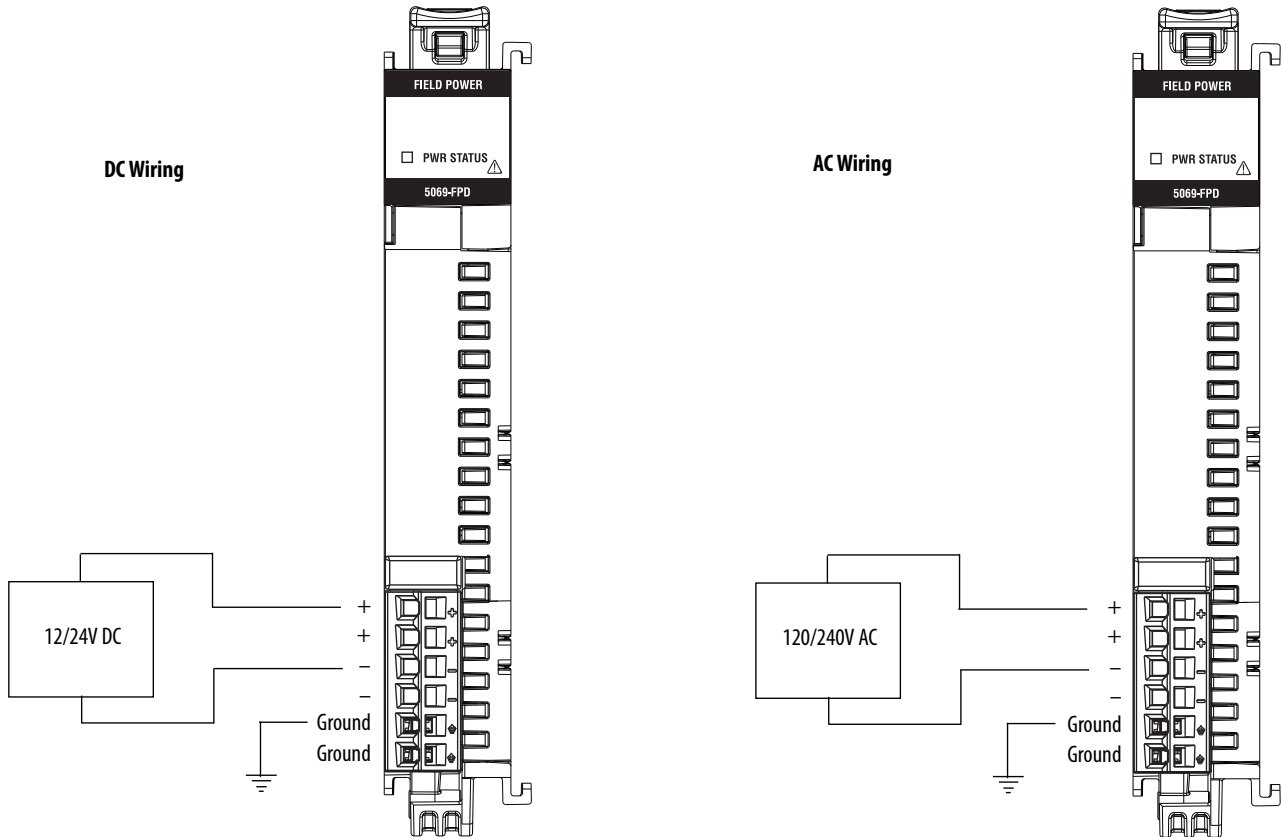
**Certifications - 5069-HSC2x0B4**

| Certification <sup>(1)</sup> | 5069-HSC2x0B4   |
|------------------------------|---|
| c-UL-us                      | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>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> |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                          | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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-FPD Field Potential Distributor

This 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   |  |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |
| Sensor Actuator (SA) Field Power voltage ranges                         | 0...32V DC<br>0...240V AC, 47...63 Hz<br>ATEX/IECEX, 125V AC max |
| Sensor Actuator (SA) Field Power current, max                           | 10 mA (DC power)<br>25 mA (AC power)                             |
| Sensor Actuator Power bus (SA Power) Passthrough voltage ranges         | 0...32V DC<br>0...240V AC, 47...63 Hz<br>ATEX/IECEX, 125V AC max |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.99 A (DC power)<br>9.975 A (AC power)                          |
| Power dissipation, max  | 4.0 W  |
| Thermal dissipation, max  | 13.6 BTU/hr  |



**Technical Specifications - 5069-FPD**

|   |   |
|---|---|
| Isolation voltage                         | 300V (continuous), Basic Insulation Type<br>Type tested at 1500V AC for 60 s  |
| Module keying                             | None  |
| Indicators                                | 1 green module status indicator   |
| Slot width                                | 1   |
| Dimensions (HxWxD), approx                | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)  |
| DIN rail                                  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes: <ul style="list-style-type: none"> <li>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)</li> <li>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.)</li> </ul> |
| RTB                                       | 5069-RTB6-SCREW<br>5069-RTB6-SPRING   |
| Terminal screw torque (5069-RTB4-SCREW)   | 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 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-RTB6-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-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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

(2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

(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**

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

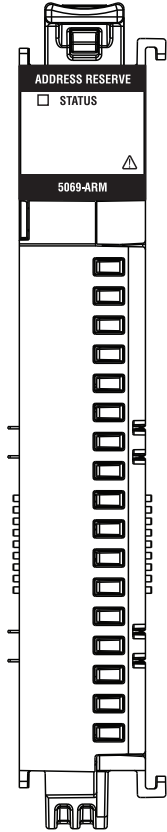
**Certifications - 5069-FPD**

| Certifications <sup>(1)</sup> | 5069-FPD  |
|-------------------------------|---|
| c-UL-us                       | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>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> |
| RCM                           | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                           | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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.

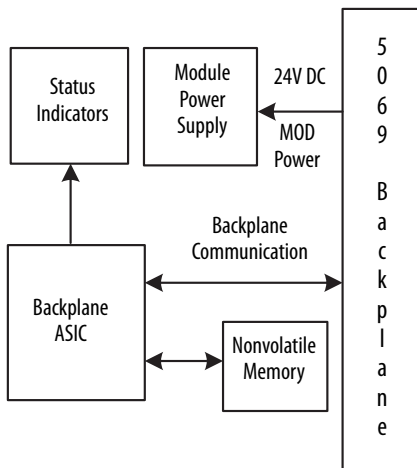
## 5069-ARM Address Reserve Module

This figure shows the 5069-ARM module.  
**5069-ARM Module**



This 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   |   |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC   |
| Module Power bus (MOD Power) current, max                               | 45 mA   |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC   |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A  |
| Sensor Actuator (SA) Field Power voltage ranges                         | Not used  |
| Sensor Actuator (SA) Field Power current, max                           | Not used  |
| Sensor Actuator Power bus (SA Power) Passthrough voltage ranges         | 0...32V DC<br>0...240V AC, 47...63 Hz<br>ATEX/IECEX, 125V AC max  |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A (DC power)<br>9.975 A (AC power)   |
| 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  | 138 x 22 x 105 mm (5.43 x 0.87 x 4.15 in.)  |
| DIN rail  | Compatible zinc-plated, yellow-chromate steel DIN rail. You can use the following DIN rail sizes: <ul style="list-style-type: none"> <li>• EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.)</li> <li>• EN50022 - 35 x 15 mm (1.38 x 0.59 in.)</li> </ul> |
| 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) Maximum level of MOD Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

(2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

**Environmental Specifications - 5069-ARM**

| Attribute   | 5069-ARM                     |
|---|------------------------------|
| Temperature, operating<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): | -40...+85 °C (-40...+185 °F) |

**Environmental Specifications - 5069-ARM**

| Attribute  | 5069-ARM   |
|--|--|
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): | 5...95% noncondensing  |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating):                     | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock):      | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock):   | 50 g   |
| Emissions  | IEC 61000-6-4  |
| ESD immunity<br>IEC61000-4-2:  | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC61000-4-3                                 | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| Voltage variation<br>IEC 61000-4-29:                                 | 10 ms interruption on DC supply ports  |

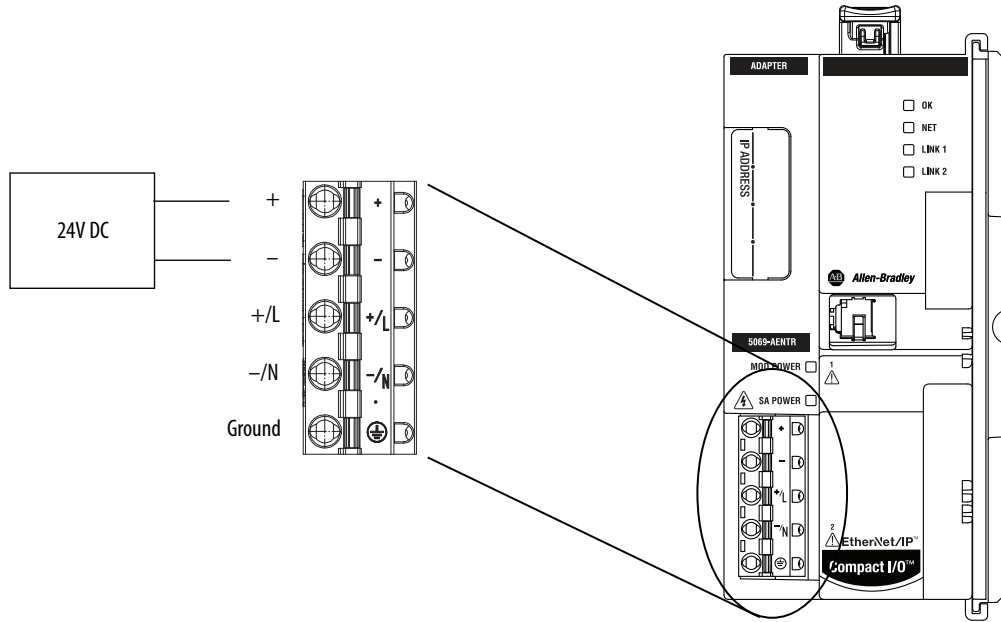
**Certifications - 5069-ARM**

| Certifications <sup>(1)</sup> | 5069-ARM   |
|-------------------------------|--|
| c-UL-us                       | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.<br>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> |
| RCM                           | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3   |
| EAC                           | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>Russian Customs Union TR CU 004/2011 LV Technical Regulation  |

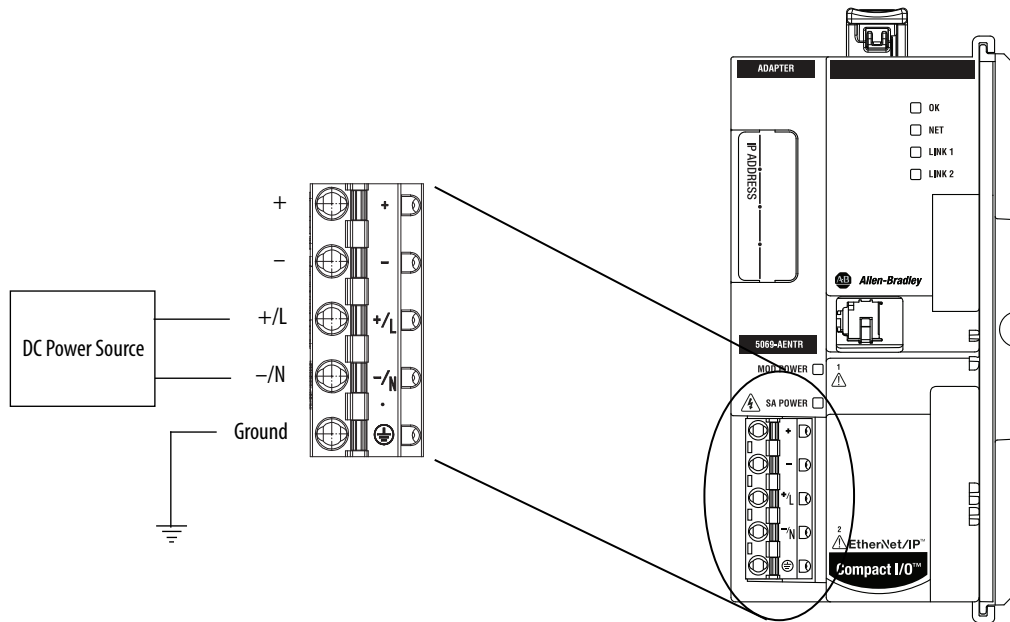
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

### 5069-AENTR EtherNet/IP Adapter

This figure shows a wiring diagram for how to connect MOD power to the 5069-AENTR EtherNet/IP adapter.  
**5069-AENTR Wiring Diagram - MOD Power (DC)**

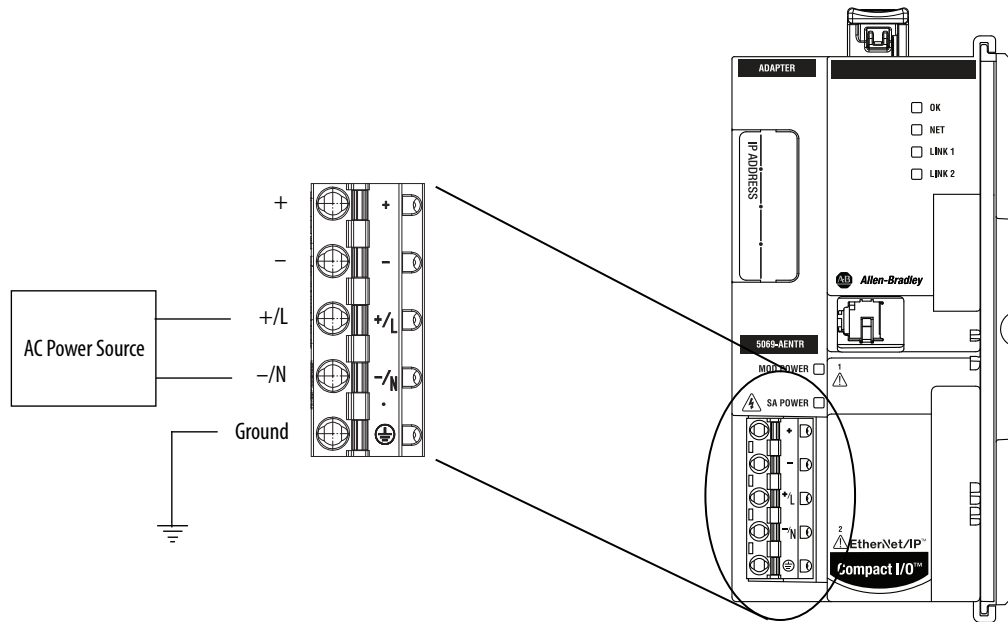


This figure shows a wiring diagram for how to connect SA power (DC) to the 5069-AENTR EtherNet/IP adapter.  
**5069-AENTR Wiring Diagram - SA Power (DC)**



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

**5069-AENTR - Wiring Diagram - SA Power (AC)**



**Technical Specifications - 5069-AENTR**

| Attribute   | 5069-AENTR   |
|---|--|
| Enclosure type rating   | None (open-style)  |
| Voltage and current ratings   |  |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |
| Module Power bus (MOD Power) current, max                               | 220 mA   |
| Module Power bus (MOD Power) inrush                                     | 1750 mA  |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.78 A   |
| Sensor Actuator (SA) Field Power voltage ranges                         | 0...32V DC<br>0...240V AC, 47...63 Hz  |
| Sensor Actuator (SA) Field Power current, max                           | 5 mA (DC power)<br>2 mA (AC power)   |
| Sensor Actuator Power bus (SA Power) Passthrough voltage ranges         | 0...32V DC<br>0...240V AC, 47...63 Hz  |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A (DC power)<br>9.975 A (AC power)  |
| Recommended external overcurrent protection                             | MOD Power: 10...12A @ 22.5...43.2 A2t, Fast Acting<br>SA Power: 20 A @ 250V AC |
| Power dissipation, max  | 8.5 W  |
| Thermal dissipation, max  | 29 BTU/hr  |



**Technical Specifications - 5069-AENTR**

| Attribute                                    | 5069-AENTR  |
|--|---|
| Isolation voltage                            | 300V (continuous), Basic Insulation Type, SA, and MOD Power to Backplane<br>300V (continuous), Basic Insulation Type, SA to MOD Power<br>300V (continuous), Basic Insulation Type, Ethernet to Backplane<br>Type tested at 1500V AC for 60 s<br>300V (continuous), Double Insulation Type, Ethernet to MOD Power<br>300V (continuous), Double Insulation Type, Ethernet to SA Power<br>Type tested at 4242V DC for 60 s<br>No isolation between Ethernet ports  |
| 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. |
| Terminal screw torque (5069-RTB5-SCREW only) | 0.5 . . . 0.6 N·m (4.4 . . . 5.3 lb·in)   |
| Wiring category <sup>(3), (4)</sup>          | 2 - on signal ports<br>1 - on power ports<br>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.<br>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.<br>Ethernet connections: Ethernet Cabling and Installation according to IEC 61918 and IEC 61784-5-2.  |
| Insulation stripping length                  |   |
| 5069-RTB5-SCREW connections                  | 10 mm (0.39 in.)  |
| 5069-RTB5-SPRING 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 module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.
- (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**

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

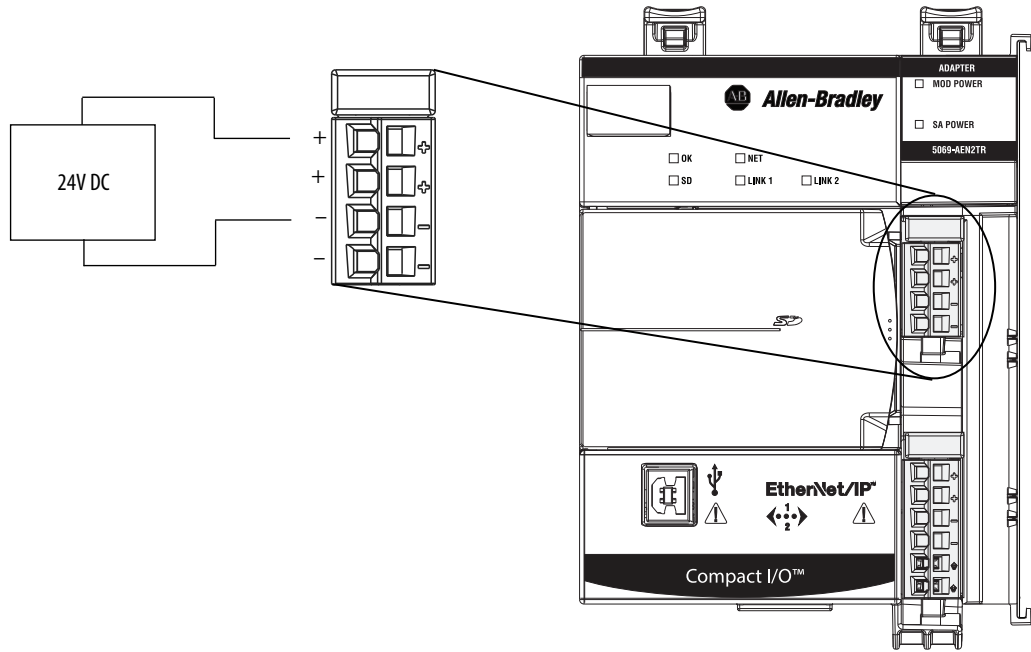
**Certifications - 5069-AENTR**

| Certifications <sup>(1)</sup> | 5069-AENTR  |
|-------------------------------|---|
| c-UL-us                       | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657.<br>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:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                           | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>Russian Customs Union TR CU 004/2011 LV Technical Regulation   |
| EtherNet/IP                   | ODVA conformance tested to EtherNet/IP specifications   |

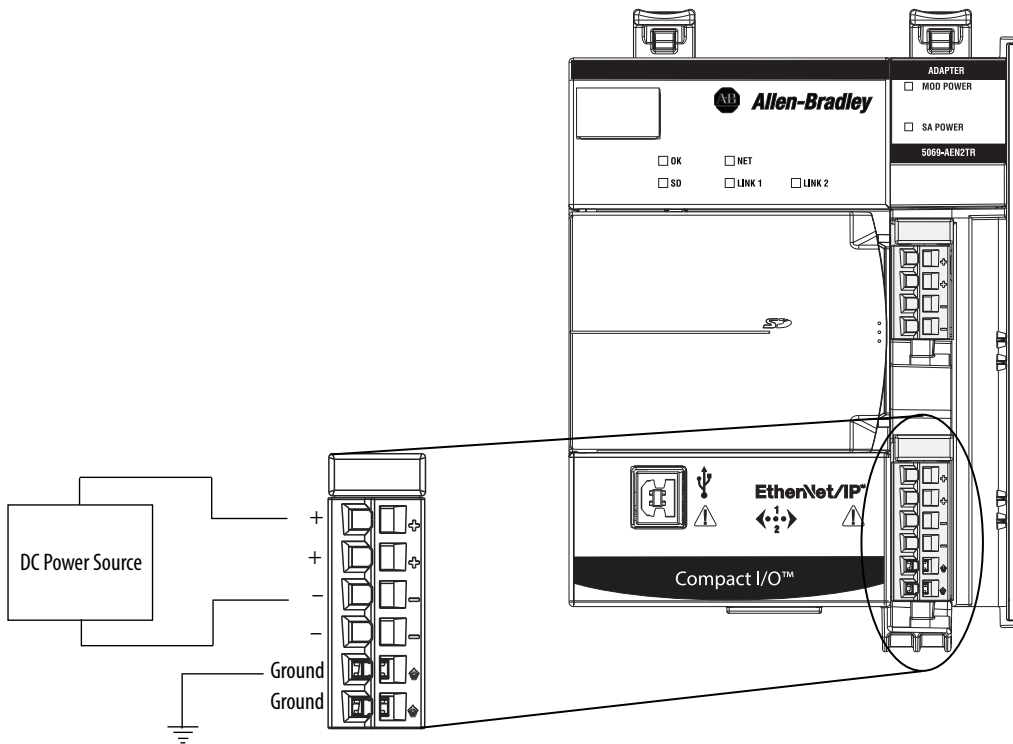
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 5069-AEN2TR EtherNet/IP Adapter

This 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)**

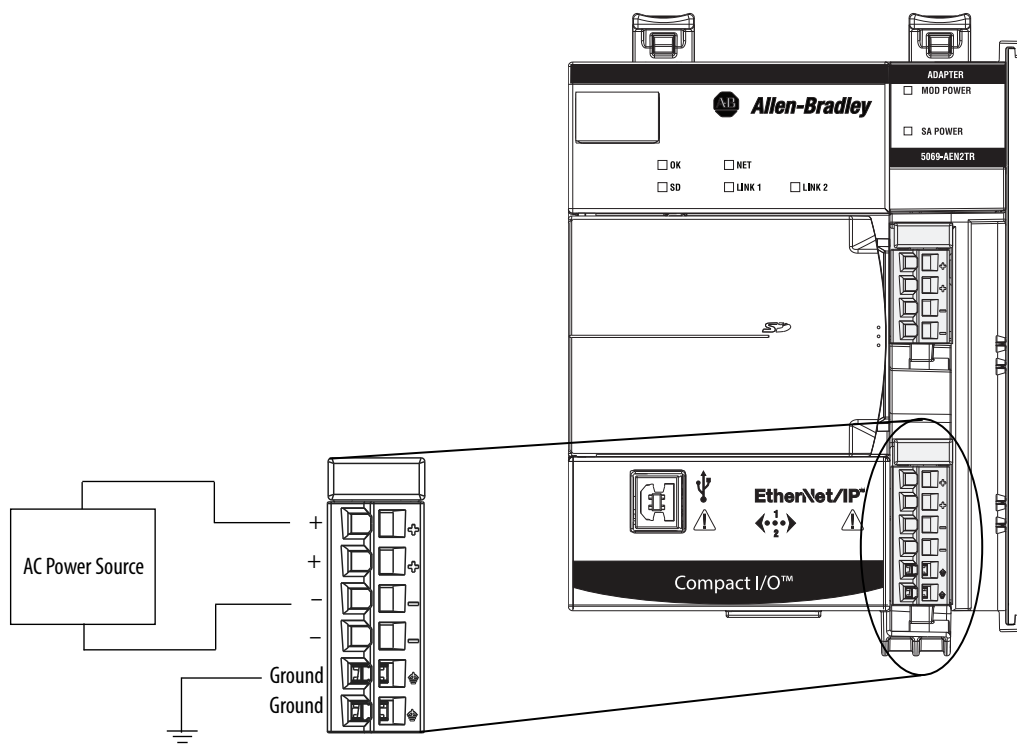


This figure shows a wiring diagram for how to connect SA power (DC) to the 5069-AEN2TR EtherNet/IP adapter.  
**5069-AEN2TR Wiring Diagram - SA Power (DC)**



This 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   |  |
| Module Power bus (MOD Power) voltage range                              | 18...32V DC  |
| Module Power bus (MOD Power) current, max                               | 450 mA   |
| Module Power bus (MOD Power) inrush                                     | 850 mA   |
| Module Power bus (MOD Power) Passthrough voltage range                  | 18...32V DC  |
| Module Power bus (MOD Power) current rating, max <sup>(1)</sup>         | 9.55 A   |
| Sensor Actuator (SA) Field Power voltage ranges                         | 0...32V DC<br>0...240V AC, 47...63 Hz<br>ATEX/IECEX, 125V AC max |
| Sensor Actuator (SA) Field Power current, max                           | 10 mA (DC power)<br>25 mA (AC power)                             |
| Sensor Actuator Power bus (SA Power) Passthrough voltage ranges         | 0...32V DC<br>0...240V AC, 47...63 Hz<br>ATEX/IECEX, 125V AC max |
| Sensor Actuator Power bus (SA Power) current rating, max <sup>(2)</sup> | 9.95 A (DC power)<br>9.975 A (AC power)                          |
| Power dissipation, max  | 8.5 W  |
| Thermal dissipation, max  | 29 BTU/hr  |

**Technical Specifications**

| Attribute  | 5069-AEN2TR  |
|--|--|
| Isolation voltage  | 300V (continuous), basic insulation type, SA, and MOD Power to backplane<br>300V (continuous), basic insulation type, SA to MOD Power<br>300V (continuous), basic insulation type, Ethernet to backplane<br>300V (continuous), double insulation type, Ethernet to MOD Power<br>300V (continuous), double insulation type, Ethernet to SA Power<br>50V (continuous), functional insulation type, Ethernet to USB<br>300V (continuous), basic insulation type, USB to backplane<br>300V (continuous), double insulation type, USB to MOD Power<br>300V (continuous), double insulation type, USB to SA Power<br>No isolation between Ethernet ports<br>Type tested at 1500V AC for 60 s |
| Dimensions (HxWxD), approx                               | 138 x 98 x 137 mm (5.43 x 3.86 x 5.39 in.)   |
| 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.                            |
| Terminal screw torque (5069-RTB4-SCREW, 5069-RTB6-SCREW) | 0.4 N•m (3.5 lb•in)  |
| Wiring category <sup>(3)</sup>                           | 3 - on USB port<br>2 - on power ports<br>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  |
| 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 module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

(2) Maximum level of SA Power current that the module is capable of passing through to the next module in the system. The specific level of current passed through varies based on system configuration.

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

**Environmental Specifications**

| <b>Attribute</b>   | <b>5069-AEN2TR</b>   |
|--|--|
| Temperature, operating<br>IEC 60068-2-1 (Test Ab, Operating Cold),<br>IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat),<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat),<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40...+85 °C (-40...+185 °F)   |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)  | 5...95% noncondensing  |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating)  | 4.6 g @ 10...500 Hz  |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)   | 30 g   |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g   |
| Emissions  | IEC 61000-6-4  |
| ESD immunity<br>IEC61000-4-2   | 6 kV contact discharges<br>8 kV air discharges   |
| Radiated RF immunity<br>IEC61000-4-3   | 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4  | ±4 kV @ 5 kHz on power ports<br>±2 kV @ 5 kHz on Ethernet ports  |
| Surge transient immunity<br>IEC 61000-4-5  | ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports<br>±2 kV line-earth (CM) on Ethernet ports   |
| Conducted RF immunity<br>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<br>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.<br>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> |
| RCM                           | Australian Radiocommunications Act, compliant with:<br>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:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| EAC                           | Russian Customs Union TR CU 020/2011 EMC Technical Regulation<br>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.



## Additional Resources

These documents contain more information about related products from Rockwell Automation.

| Resource  | Description  |
|---|--|
| Replacement Guidelines: Logix5000 Controllers Reference Manual, publication <a href="#">1756-RM100</a>  | Provides guidelines on how to replace the following: <ul style="list-style-type: none"> <li>ControlLogix 5560/5570 controller with a ControlLogix 5580 controller</li> <li>CompactLogix 5370 L3 controllers with a CompactLogix 5380 controller</li> </ul> |
| EtherNet/IP Communication Modules in 5000 Series Systems User Manual, publication <a href="#">ENET-UM004</a>  | Describes how to install, configure, and operate the COMPACT 5000 I/O EtherNet/IP adapters.  |
| COMPACT 5000 Digital I/O Modules in Logix5000 Control Systems User Manual, publication <a href="#">5000-UM004</a>   | Provides information on how to install, configure, and operate COMPACT 5000 digital I/O modules.   |
| COMPACT 5000 Analog I/O Modules in Logix5000 Control Systems User Manual, publication <a href="#">5000-UM005</a>  | Provides information on how to install, configure, and operate COMPACT 5000 analog I/O modules.  |
| COMPACT 5000 High-speed Counter Module in Logix5000 Control Systems User Manual, publication <a href="#">5000-UM006</a>   | Provides information on how to install, configure, and operate COMPACT 5000 high-speed counter modules.  |
| 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/rockwellautomation/certification/overview.page">http://www.rockwellautomation.com/rockwellautomation/certification/overview.page</a> | Provides declarations of conformity, certificates, and other certification details.  |

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

## Rockwell Automation Support

Use the following resources to access support information.

|   |   |  |
|---|---|--|
| <b>Technical Support Center</b>                         | Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.                     | <a href="http://www.rockwellautomation.com/knowledgebase">www.rockwellautomation.com/knowledgebase</a>   |
| <b>Local Technical Support Phone Numbers</b>            | Locate the phone number for your country.   | <a href="http://www.rockwellautomation.com/global/support/get-support-now.page">www.rockwellautomation.com/global/support/get-support-now.page</a> |
| <b>Direct Dial Codes</b>                                | Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer. | <a href="http://www.rockwellautomation.com/global/support/direct-dial.page">www.rockwellautomation.com/global/support/direct-dial.page</a>         |
| <b>Literature Library</b>                               | Installation Instructions, Manuals, Brochures, and Technical Data.  | <a href="http://www.rockwellautomation.com/literature">www.rockwellautomation.com/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://www.rockwellautomation.com/global/support/pcdc.page">www.rockwellautomation.com/global/support/pcdc.page</a>                       |

## Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at [http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002\\_-en-e.pdf](http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf).

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

Allen-Bradley, COMPACT 5000, CompactLogix, LISTEN. THINK. SOLVE, LOGIX 5000, Rockwell Automation, Rockwell Software, and Studio 5000 Logix Designer are trademarks of Rockwell Automation, Inc. Trademarks not belonging to Rockwell Automation are property of their respective companies.

Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

**[www.rockwellautomation.com](http://www.rockwellautomation.com)**

### Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444  
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640  
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 5069-TD001F-EN-P - September 2017

Supersedes Publication 5069-TD001E-EN-P - July 2017

Copyright © 2017 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.