



# Relays for use in hazardous locations

Class I, Division 2, ATEX, and IECEx

# Hazardous location relays

The industry has imposed stringent requirements on the reliability and safety of the switching components in potentially explosive areas. In order to protect against explosion, all equipment that could be exposed to the flammable or combustible atmospheres in hazardous (classified) locations must be of a type suitable for installation in these areas. The classes and groups for which equipment has been certified are shown in the individual certifications under the respective categories and are marked on the equipment itself.

Phoenix Contact offers triple-rated hazardous location relays in our slim PLC Relay series that have the required approvals for industrial control equipment. The triple rating includes approvals for:

- Class I, Division 2 (CID2) UL/cUL Listed (for use in the Americas)
- ATEX is certified through UL/DEMKO (for use in Europe)
- IECEx is a certification scheme championed by the IEC (for countries outside Europe)

The IECEx scheme is a very positive step toward a world certification system. When combined with ATEX and Class I, Division 2 as a triple rating, it will help you make a more informed decision during the process of designing, building, or purchasing products for hazardous area applications. Having a hazardous-location-approved triple rating will be beneficial in simplifying the export process.



# Class I, Division 2 (CID2) relays

## PLC-INTERFACE for hazardous areas

Relay modules with ATEX, IECEx, and Class I, Division 2 approval for potentially explosive applications as well as solid-state relays with Class I, Division 2 approval.

The advantages:

- Slim design
- Functional jumpers
- Integrated input and interference suppression circuit
- RTIII-sealed relays
- Safe isolation according to DIN EN 50178 between coil and contact

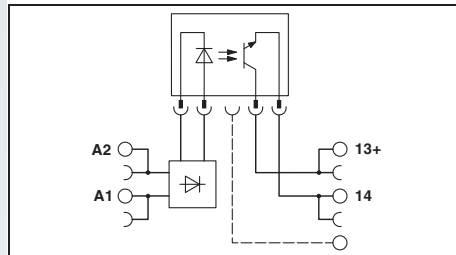


Solid-state relay module, DC output max. 3 A

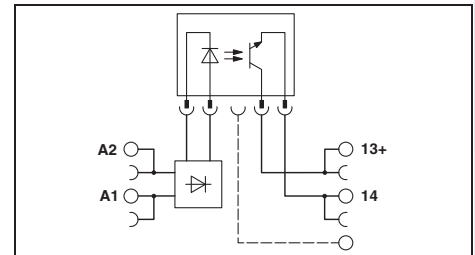


Solid-state relay module, DC output max. 100 mA

Ex:



Ex:



<b>Notes:</b>	
Type of insulating housing:	Polyamide PBT, non-reinforced, color: green.
Marking systems and mounting material	
Separating plate PLC-ATP must be installed for voltages larger than 250 V (L1, L2, L3) between identical terminal blocks in adjacent modules. Potential bridging is then carried out with FBST 8-PLC... or FBST 500....	
1) Ambient temperature (operation): -40°C ... 55°C (ATEX / IECEx)	

Input data	
Permissible range (with reference to $U_N$ )	
Switching level (with reference to $U_N$ )	1 signal ("H") 0 signal ("L")
Typical input current at $U_N$	[mA]
Typical response time/switch-on time at $U_N$	[ms]
Typical release time/switch-off time at $U_N$	[ms]
Transmission frequency $f_{limit}$	[Hz]
Input circuit DC	
Input circuit AC/DC	
Output data	
Contact material	
Max. switching voltage	
Minimum switching voltage	
Limiting continuous current	
Maximum switch-on current	
Minimum switching current	
Output protection	
Voltage drop at maximum limiting continuous current	
General data	
Test voltage input/output	
Ambient temperature (operation)	
Mechanical service life	
Standards/regulations	
Degree of pollution/surge voltage category	
Connection data solid/stranded/AWG	
Dimensions	W / H / D
EMC note	
Conformance/approvals	
Conformance	
ATEX	
IECEX	
UL, USA	
UL, USA/Canada	
UL, Canada	

Description	Input voltage $U_N$
<b>PLC INTERFACE, with screw connection</b>	
①	12 V DC
②	24 V DC
③	120 V AC / 110 V DC
④	230 V AC / 220 V DC
<b>PLC-INTERFACE, with push-in connection</b>	
①	12 V DC
③	24 V DC
④	120 V AC / 110 V DC
⑤	230 V AC / 220 V DC

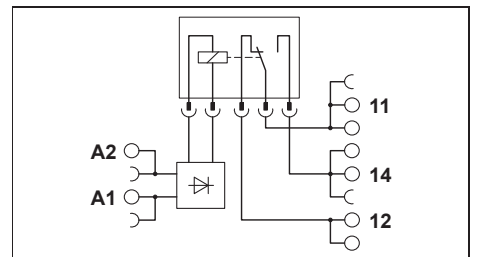
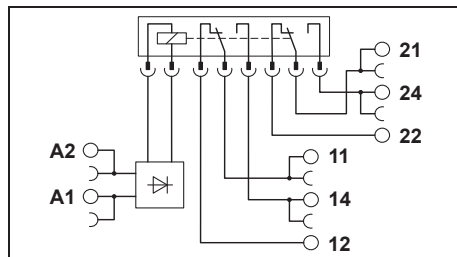
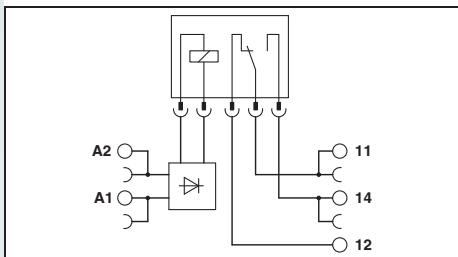
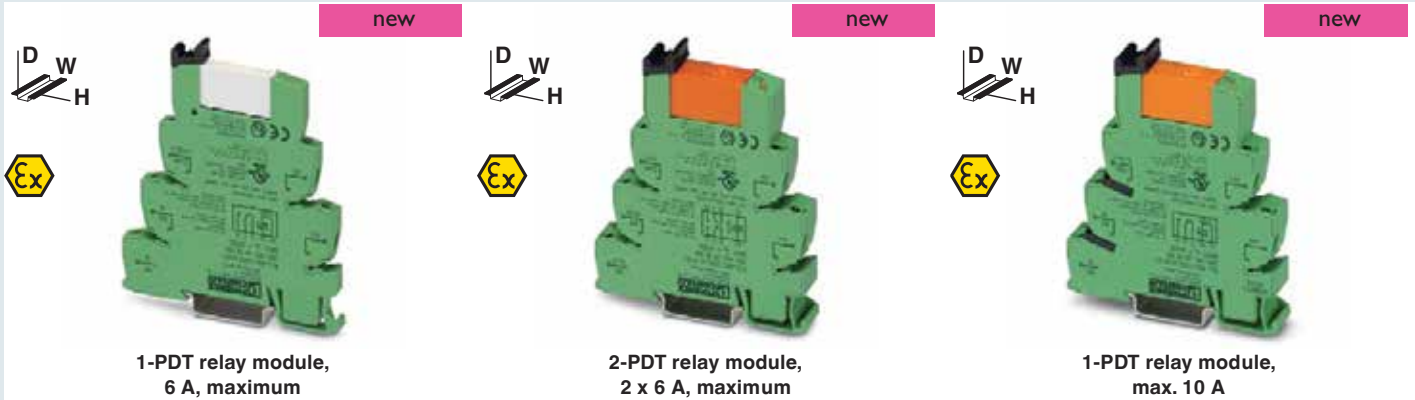
Technical data	
②	③
0.8 - 1.2	0.9 - 1.1
≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.3
8.5	3.5
0.02	3.5
0.3	7
300	10
Yellow LED, Reverse polarity protection, Free-wheeling diode	
Yellow LED, Bridge rectifier	
-	
33 V DC	
3 V DC	
3 A	
15 A (10 ms)	
-	
Reverse polarity protection, Surge protection	
≤ 200 mV	
2.5 kV (50 Hz, 1 min.)	
-20 °C ... 60 °C	
-	
IEC 60664, EN 50178	
2 / III	
0.14 - 2.5 mm <sup>2</sup> / 0.14 - 2.5 mm <sup>2</sup> / 26 - 14	
6.2 mm / 80 mm / 94 mm	
Class A product, see page 605	
CE-compliant	
-	
-	
Class I, Zone 2, AEx nA nC IIC T6	
Class I, Div. 2, Groups A, B, C, D	
Class I, Zone 2, Ex nA nC IIC Gc T6 X	

Ordering data		
Type	Order no.	Replacement relay order no.
PLC-OSC- 24DC/ 24DC/ 2/C1D2	5603260	2966595
PLC-OSC-120UC/ 24DC/ 2/C1D2	5603262	2966605

Technical data	
②	③
0.8 - 1.2	0.9 - 1.1
≥ 0.8	≥ 0.8
≤ 0.4	≤ 0.3
8.5	3.5
0.02	3
0.3	4
300	10
Yellow LED, Reverse polarity protection, Free-wheeling diode	
Yellow LED, Bridge rectifier	
-	
48 V DC	
3 V DC	
100 mA	
-	
Reverse polarity protection, Surge protection	
≤ 1 V	
2.5 kV (50 Hz, 1 min.)	
-20 °C ... 60 °C	
-	
IEC 60664, EN 50178	
2 / III	
0.14 - 2.5 mm <sup>2</sup> / 0.14 - 2.5 mm <sup>2</sup> / 26 - 14	
6.2 mm / 80 mm / 94 mm	
Class A product, see page 605	
CE-compliant	
-	
-	
Class I, Zone 2, AEx nA nC IIC T6	
Class I, Div. 2, Groups A, B, C, D	
Class I, Zone 2, Ex nA nC IIC Gc T6 X	

Ordering data		
Type	Order no.	Replacement relay order no.
PLC-OSC- 24DC/ 48DC/100/C1D2	5603261	2966618
PLC-OSC-120UC/ 48DC/100/C1D2	5603263	2966621

# Triple-rated relays: Class I, Division 2 (CID2), ATEX, and IECEx



## Technical data

①	②	③	④
Upon request			
15.3	9	3.5	3.2
5	5	6	7
8	8	15	15

Yellow LED, Reverse polarity protection, Free-wheeling diode  
Yellow LED, Bridge rectifier

AgSnO  
250 V AC/DC  
5 V (at 100 mA)  
6 A  
10 A (4 s)  
10 mA (at 12 V)  
-  
-

4 kV AC (50 Hz, 1 min.)  
-20 °C ... 60 °C (UL), -40 °C ... 60 °C (ATEX / IECEx)  
2 x 10<sup>7</sup> cycles  
IEC 60664, EN 50178, EN 60079-0, -7, -15  
3 / III  
0.14 - 2.5 mm<sup>2</sup> / 0.14 - 2.5 mm<sup>2</sup> / 26 - 14  
6.2 mm / 80 mm / 94 mm

CE-compliant  
Ex II 3G Ex ec nC IIC T4 Gc ( IBE XU16ATEXB015 X )  
Ex ec nC IIC T4 Gc ( IECEx IBE 16.0029X )  
Class I, Zone 2, AEx nA nC IIC T6  
Class I, Div. 2, Groups A, B, C, D  
Class I, Zone 2, Ex nA nC IIC Gc T6 X

## Technical data

①	②	③	④
Upon request			
33	18	4.5	4.5
8	8	7	7
10	10	10	10

Yellow LED, Reverse polarity protection, Free-wheeling diode  
Yellow LED, Bridge rectifier

AgNi  
250 V AC/DC  
5 V AC/DC (at 10 mA)  
6 A  
15 A (300 ms)  
10 mA (At 5 V)  
-  
-

4 kV AC (50 Hz, 1 min.)  
-20 °C ... 60 °C (UL), -40 °C ... 60 °C (ATEX / IECEx)  
3 x 10<sup>7</sup> cycles  
IEC 60664, EN 50178, EN 60079-0, -7, -15  
2 / III  
0.14 - 2.5 mm<sup>2</sup> / 0.14 - 2.5 mm<sup>2</sup> / 26 - 14  
14 mm / 80 mm / 94 mm

CE-compliant  
Ex II 3G Ex ec nC IIC T4 Gc ( IBE XU16ATEXB015 X )  
Ex ec nC IIC T4 Gc ( IECEx IBE 16.0029X )  
Class I, Zone 2, AEx nA nC IIC T6  
Class I, Div. 2, Groups A, B, C, D  
Class I, Zone 2, Ex nA nC IIC Gc T6 X

## Technical data

①	②	③	④
Upon request			
33	18	4.5	4.5
8	8	7	7
10	10	10	10

Yellow LED, Reverse polarity protection, Free-wheeling diode  
Yellow LED, Bridge rectifier

AgNi  
250 V AC/DC  
12 V AC/DC  
10 A  
30 A (300 ms)  
100 mA  
-  
-

4 kV AC (50 Hz, 1 min.)  
-20 °C ... 60 °C (UL), -40 °C ... 60 °C (ATEX / IECEx)  
3 x 10<sup>7</sup> cycles  
IEC 60664, EN 50178, EN 60079-0, -7, -15  
2 / III  
0.14 - 2.5 mm<sup>2</sup> / 0.14 - 2.5 mm<sup>2</sup> / 26 - 14  
14 mm / 80 mm / 94 mm

CE-compliant  
Ex II 3G Ex ec nC IIC T4 Gc ( IBE XU16ATEXB015 X )  
Ex ec nC IIC T4 Gc ( IECEx IBE 16.0029X )  
Class I, Zone 2, AEx nA nC IIC T6  
Class I, Div. 2, Groups A, B, C, D  
Class I, Zone 2, Ex nA nC IIC Gc T6 X

## Ordering data

Type	Order No.	Replacement relay order no.
PLC-RSC-12DC/21/EX	2909522	2961150
PLC-RSC-24DC/21/EX	2909524	2961105
PLC-RSC-120UC/21/EX	2909525	2961118
PLC-RSC-230UC/21/EX <sup>1</sup>	2909526	2961118
PLC-RPT-12DC/21/EX	2909527	2961150
PLC-RPT-24DC/21/EX	2909528	2961105
PLC-RPT-120UC/21/EX	2909529	2961118
PLC-RPT-230UC/21/EX <sup>1</sup>	2909530	2961118

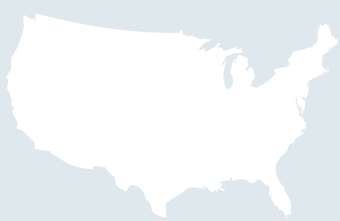
## Ordering data

Type	Order No.	Replacement relay order no.
PLC-RSC-12DC/21-21/EX	2909517	2906988
PLC-RSC-24DC/21-21/EX	2909509	2906213
PLC-RSC-120UC/21-21/EX	2909511	2908824
PLC-RSC-230UC/21-21/EX <sup>1</sup>	2909512	2908824
PLC-RPT-12DC/21-21/EX	2909513	2906988
PLC-RPT-24DC/21-21/EX	2909514	2906213
PLC-RPT-120UC/21-21/EX	2909515	2908824
PLC-RPT-230UC/21-21/EX <sup>1</sup>	2909516	2908824

## Ordering data

Type	Order no.	Replacement relay order no.
PLC-RSC-12DC/21HC/EX	2909518	2908821
PLC-RSC-24DC/21HC/EX	2909519	2908822
PLC-RSC-120UC/21HC/EX	2909520	2908823
PLC-RSC-230UC/21HC/EX <sup>1</sup>	2909521	2908823
PLC-RPT-12DC/21HC/EX	2909531	2908821
PLC-RPT-24DC/21HC/EX	2909532	2908822
PLC-RPT-120UC/21HC/EX	2909533	2908823
PLC-RPT-230UC/21HC/EX <sup>1</sup>	2909534	2908823

# Areas of explosion protection



## North America

Hazardous (classified) locations, as defined in the National Electric Code (NEC), are locations where fire or explosion hazards may exist due to the presence of flammable gases, vapors, flammable liquids, combustible dusts, ignitable fibers or flying matter. Article 500 of the NEC divides all hazardous (classified) locations into Classes, Divisions and Groups.

Phoenix Contact's hazardous-location relays have been tested and approved for Class I, Division 2; Groups A, B, C, D; and Class I, Zone 2.

**UL, USA:** Class I, Zone 2, AEx nA nC IIC T6

**UL, USA/Canada:** Class I, Div. 2, Groups A, B, C, D

**UL, Canada:** Class I, Zone 2, Ex nA nC IIC Gc T6 X

- **Class I:** Areas in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures
- **Division 2:** Hazard under abnormal conditions
- **Groups A, B, C, D:** gas mixtures have been grouped on the basis of their characteristics:
  - **Group A** – Atmospheres containing acetylene
  - **Group B** – Atmospheres containing acrolein, butadiene, ethylene oxide, propylene oxide, and hydrogen, as well as fuel and combustible process gases containing more than 30 percent hydrogen by volume
  - **Group C** – Atmospheres containing ethyl ether and ethylene
  - **Group D** – Atmospheres containing acetone, ammonia, benzene, butane, cyclopropane, ethanol, gasoline, hexane, methane, methanol, naphtha, and propane
- **Class I, Zone 2, AEx nA nC IIC T6 (U.S.)**
- **Class I, Zone 2, Ex nA nC IIC T6 (Canada)**
- **Class I:** Areas in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures
- **Zone 2** – Hazard under abnormal conditions
- **AEx** – Conformity to U.S. requirements
- **Ex** – Conformity to Canadian requirements
- **nA** – Nonsparking – Equipment has no normally arcing parts or thermal effects capable of ignition
- **nC** – Sparking with protected contacts – Arcing contacts are in nonincendive circuits or are inside a hermetically sealed container or sealed device
- **IIC** – Gas group
- **T6** – Temperature class 85°C




## Europe

The countries that make up the European Economic Area adopt directives as their national laws. The ATEX Directive is the law in every country in the European Community. Part of the law states that all products for use in explosive atmospheres must meet the Directive.

This means that all manufacturers of mechanical and electrical equipment intended for use in potentially explosive atmospheres and that wish to place these products on the market within the European Union must comply with the ATEX Directive.

The hazardous-location relays are also ATEX approved and classified into device groups and categories. Our triple-rated HAZLOC relays are approved for Device Group II and Category 3G, for use in Zone 2 (gases).

Approval:  II 3G Ex ec nC IIC T4 Gc (IB ExU16ATEXB015 X)

- **II (Equipment group)** – Areas with explosive atmosphere like chemical industries or mills (combustible gases and dusts)
- **3G (Equipment category)** – Equipment suitable for Zone 2, intended for use in areas where an explosive atmosphere is unlikely to occur in normal operation
- **Ex** (Explosion protection)
- **ec (Protection type)** – Increased safety, no arcs, sparks, or hot surfaces
- **nC (Protection type)** – Sealed device
- **II (Device group)** – Surface (non-mining) equipment
- **C (Gas group)** – Atmospheres containing hydrogen or acetylene
- **T4 (Temperature class)** – Maximum surface temperature 135°C (275°F)
- **Gc** (Equipment protection level) – Protection level: assured level of protection against becoming an ignition source in normal operation



## International

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes international standards for all electrical, electronic, and related technologies. IECEx is a single global certification framework based on the IEC's international standards. It caters to countries whose national standards are either identical to those of the IEC or very close to IEC standards. The IECEx approval is truly global in concept and practice, reduces trade barriers caused by different conformity assessment criteria in various countries, and helps industry open up new markets.

Approval: Ex ec nC IIC T4 Gc (IEX Ex IBE 16.0029X)

- **Ex** – Explosion-proof electrical equipment
- **ec (Protection type)** – Increased safety, no arcs, sparks, or hot surfaces
- **nC (Protection type)** – Sealed device
- **II (Device group)** – Surface (non-mining) equipment
- **C (Gas group)** – Atmospheres containing hydrogen, acetylene
- **T4 (Temperature class)** – Maximum surface temperature 135°C (275°F)
- **Gc (Equipment protection level)** – Protection level: assured level of protection against becoming an ignition source in normal operation

## Ongoing communication with customers and partners worldwide

Phoenix Contact is a global, market leader based in Germany. Our group is known for its future-oriented components, systems, and solutions in the fields of electrical engineering, electronics, and automation.

With a global network reaching across more than 100 countries and 14,500 employees, we can stay in close contact with our customers, something we believe is essential to success. The wide variety of our innovative products makes it easy for our customers to find future-oriented solutions for multiple applications and industries. We especially focus on the fields of energy, infrastructure, process, and factory automation.



You will find our complete product range at:  
[www.phoenixcontact.com](http://www.phoenixcontact.com)

### USA

PHOENIX CONTACT  
P.O. Box 4100  
Harrisburg, PA 17111-0100  
Phone: 800-888-7388  
717-944-1300  
Technical Service: 800-322-3225  
Fax: 717-944-1625  
E-mail: [info@phoenixcon.com](mailto:info@phoenixcon.com)  
Website: [www.phoenixcontact.com](http://www.phoenixcontact.com)

### Canada

PHOENIX CONTACT Ltd.  
8240 Parkhill Drive  
Milton, Ontario L9T 5V7  
Toll Free: 800-890-2820  
Phone: 905-864-8700  
Fax: 905-864-7900  
E-mail: [cdinfo@phoenixcontact.ca](mailto:cdinfo@phoenixcontact.ca)