The importance of the reliability of industrial automation equipment is growing with the increase in use of electronic modules. Modern relay or solid-state relay interfaces perform a wide range of tasks. Whether in production engineering, for the electrical equipment of machines or in control engineering for energy distribution, building automation and materials processing – the main aim is to guarantee the exchange of signals between the process peripherals and the superior, central control systems. This exchange must provide reliable operation, be floating and electrically unambiguous. Safe electrical interface modules that meet the requirements of modern system concepts must include the following features:

– Coupling of different signal levels
– Safe electrical isolation between input and output
– High interference insensitivity.

In practice, a relay interface comes into use with a flexible interface configuration with a large switching capacity range and the possibility of combining different types of contact. Further important features of relay interfaces are:

– Electrical isolation between open contacts
– Switching of independent switching current types
– High short-term overload resistance in the event of a short circuit or voltage peaks
– Practically impervious to electromagnetic fields
– Easy handling.

Solid-state relay modules are used when an interface between the process peripherals and electronics is subject to the following requirements:

– Low control power
– High switching frequencies
– Wear-free switching with no contact bounce
– Resistance to vibration and impacts
– Long service life.
Relay modules

Product overview

**RIFLINE complete**

- **RIF-0** for miniature and solid-state relays
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- **RIF-1** for miniature and solid-state relays
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- **RIF-2** for industrial relays
  - Page 290
- **RIF-3** for octal relays
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**PLC series**

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  - As sensor/actuator version
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- For high inrush/continuous currents
  - Resistant to interference currents/voltages
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**Safety devices**

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**Monitoring relays**

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Relay modules
Product overview

PR series

PR1 for miniature or solid-state relays
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Special relay and solid-state relay modules

Relay terminal blocks with switch
Page 403

Interference-free relays and solid-state relays
Page 404

Relays for switching lamp loads
Page 407

Solid-state power relays with 400 V AC/400 V AC/3 A output
Page 408
In the case of a pure DC input, the most important addition to the circuit is a freewheeling diode. This limits the voltages induced on the coil on circuit interruption to a value of approximately 0.7 V, which does not pose a danger to any connected control electronics.

Essentially, electromechanical relays can be divided into two main groups: monostable and bistable relays.

With monostable DC or AC relays, the contacts automatically return to the release state as soon as they are de-energized.

In the case of bistable relays, the contacts remain in their present switch position when the excitation current is switched off.

Coil side

Input circuits and voltage types

There are various kinds of input circuit depending on the type of relay used and the nature of the control voltage.

If pure AC relays are used (AC input), the input circuit is generally nothing more than a visual switching status indicator.

Unless otherwise specified, the frequency of the control voltage is 50/60 Hz.

In the case of a pure DC input, the most important addition to the circuit is a freewheeling diode. This limits the voltages induced on the coil on circuit interruption to a value of approximately 0.7 V, which does not pose a danger to any connected control electronics.

As the freewheeling diode can only perform its required function if the polarity of the voltage connection is correct, a reverse polarity protection diode is also integrated into the input circuit.

To allow DC or AC voltage operation, a bridge rectifier is connected in the input circuit. The diodes are simultaneously responsible for performing rectification, freewheeling, and polarity reversal protection functions. The interrupting voltage of the coil is limited to approximately 1.4 V.

To protect the input circuit against overvoltages, a varistor is also connected (depending on the type) upstream of the bridge rectifier.

Operating voltage range

The ambient temperature prevailing at the location of use has a major impact on certain relay operating parameters.

As the ambient temperature increases, the coil winding heats up, causing the operate and release voltages to rise. At the same time, the maximum permissible coil voltage decreases, which means that the usable working range becomes restricted as a result.

The diagram below illustrates how the operating voltage behaves as a function of the ambient temperature.
The following values are recommended for the purpose of dimensioning the RC element:
- \( R = 100 \ldots 220 \, \Omega \)
- \( C = 220 \ldots 470 \, nF \)

The SO46 series have been developed to provide even higher levels of immunity to interference. These products already contain an integrated RCZ filter. See, for example, PLC...SO46.

### Contact side, contact materials

Given the wide variety of potential applications in the different industrial sectors, the relays used must be matched to the various tasks that need to be performed by selecting the right kind of contact material.

The voltage, current, and power values play an important role when determining the suitability of contact materials. Other criteria include:
- Contact resistance
- Erosion resistance
- Material migration
- Welding tendency
- Chemical influences

In this way, the various contact materials (generally noble metal alloys) can be matched to the relevant areas of application. The adjacent table provides details of some of the key materials.

#### Contact protection circuit

Every electrical load constitutes a mixed load with ohmic, capacitive, and inductive components.

When these loads are switched, the switching contact is in turn subjected to a load, to either a lesser or greater extent. This load can be reduced by including a suitable contact protection circuit.

In view of the fact that loads with a large inductive component are predominantly used in practice (e.g., contactors, solenoid valves, motors, etc.), these application scenarios are worth considering in more detail.

On interruption, voltage peaks with values of up to several thousand volts occur due to the energy stored in the coil.

These high voltages cause an arc on the switching contact which can destroy the contact due to material vaporization and material migration. The electrical service life is reduced considerably as a result. In extreme cases, the relay may fail in the very first cycle with DC voltage and a static arc.

A protective circuit must be used to suppress the formation of an arc. With optimum dimensioning, almost the same number of cycles can be achieved as with an ohmic load.
In principle, there are a number of possible ways of achieving an effective circuit:

1. Contact wiring
2. Load wiring
3. Combination of both wiring methods

In principle, protective measures should intervene directly at the source of the interference.

Wiring a load should therefore be given priority over wiring the contact.

The following points are advantageous for the load circuit (image on right):

1. The circuit is only loaded with the induction voltage during interruption. By contrast, the sum of the operating voltage and the induction voltage is applied to the contact circuit.
2. When the contact is open, the load is electrically isolated from the operating voltage.
3. It is not possible for the load to be activated or “stick” due to undesired operating currents, e.g., from RC elements.
4. Cut-off peaks of the load cannot be coupled into parallel control lines.

Nowadays, solenoid valves are usually connected using valve plugs that are also supplied with LEDs and components that limit the induction voltage. Valve plugs with an RC element, varistor or Zener diode often do not quench the arc and only serve to comply with legislation governing EMC. Only valve plugs with an integrated 1N4007 freewheeling diode quench the arc quickly and safely, thereby increasing the service life of the relay by a factor of 5 to 10. Valve plugs with LED, integrated 1N4007, and free cable end can be supplied on request as part of the SAC range.

### Switching small loads

Small loads must be processed mainly in applications where signals must be forwarded to control inputs (e.g., of a PLC).

With these loads, no switching sparks (arcs) occur on the contacts in the small load range.

In addition to the constant cleaning effect due to contact friction, this switching spark assumes the function of penetrating non-conductive contamination layers that are formed on the contact surfaces of power contacts.
These contamination layers are usually oxidation or sulfidation products of the contact materials silver (Ag) or silver alloys such as silver nickel (AgNi) or silver tin oxide (AgSnO). As a result, the contact resistance may rise so considerably within a short time that reliable switching is no longer possible in the case of small loads.

Due to these properties, the high-performance contact materials mentioned are not suitable for small load applications.

Gold (Au) has become accepted as the contact material of choice for these areas of application mainly on account of its low and constant contact resistances even with small loads and its insensitivity to sulfurous atmospheres.

For the smallest of loads and even greater contact reliability, double contact relays with gold contacts are used.

The slotted contact spring in this design provides two parallel contact points with even lower contact resistances and considerably higher contact reliability.

Switching large DC loads

A basic distinction must be made between switching DC and AC loads.

Switching large AC loads

When switching large AC loads, the relay can be operated up to the corresponding maximum values for switching voltage, current, and power. The arc that occurs during interruption depends on the current, voltage, and phase angle. This cut-off arc usually disappears automatically the next time the load current passes through zero.

In applications with an inductive load, an effective protective circuit must be provided, otherwise the service life of the system will be reduced considerably.

Switching DC and AC loads

If higher DC loads than those documented are to be switched or if the electrical service life is to be increased, several contacts of a relay can be connected in series. See, for example, REL-IR... industrial relays.

Alternatively, solid-state relays with DC voltage output can also be used.

Switching lamps and capacitive loads

Regardless of the type of voltage, all kinds of lamps and loads with a capacitive component impose extreme requirements on the switching contacts. The moment it is switched on, in other words precisely in the dynamic chattering phase of the relay, extremely powerful current peaks occur.

These are often in the region of several tens of amps, and not infrequently are known to exceed 100 A, which results in welding of the contact. This can be remedied by using specially optimized “lamp load relays” that can cope with these inrush peaks. See, for example, PLC...IC type.

Switching capacity in accordance with utilization categories AC15 and DC13 (IEC 60947)

In practice, both the maximum interrupting rating for AC loads and the DC interruption values taken from the load limit curves provide only a rough guide for the choice of relay. In reality, this is insufficient, since real loads in the vast majority of industrial applications have inductive or capacitive components and the wiring of the loads can be totally different. As already described, this sometimes leads to considerable variations in terms of service life.

The IEC 60947 contactor standard seeks to avoid these disadvantages by dividing the loads into various utilization categories (DC13, AC15, etc.). This standard is also partly applied to relays. However, users must be aware of the fact that these values are only applicable in practice to a limited extent as well, since all DC13 and AC15 test loads are highly inductive and are also operated without any protective circuit at all (see “Contact protection circuits” section). Moreover, the switching capacity test in accordance with IEC 60947 only requires 6060 cycles to be performed by way of a minimum requirement.

A much more reliable way to determine the switching capacity and the anticipated service life is to refer to the specific application data. Using a comprehensive data bank, the service life can be accurately estimated for most applications and, if necessary, suggestions for improvement can be made. In the case of critical applications, the user is advised to gather service life information based on empirical data.
Relay modules

Basics of solid-state relay technology

Control side

Solid-state relays for various voltage and power levels are available from Phoenix Contact for use as interface modules designed to match process I/O devices to control, signaling, and regulating devices. The solid-state relay element which is actually located in the module is limited to one defined voltage range by virtue of its design. The current consumption on the input side fluctuates depending on the circuit architecture and voltage level.

To accommodate all industrial voltages between 5 V and 230 V, an input circuit is provided. The inputs for DC voltage and AC voltage must always be differentiated.

DC input

Adjustments are made in accordance with the various voltage levels by adding electronics which have been specially adapted to the desired voltage range. In the case of most modules, a polarity protection diode provides reliable protection against destruction in the event of a control voltage being connected incorrectly. Specially coordinated filters reliably suppress possible high-frequency noise emissions.

Figure 1: block diagram for DC input

Load side

Depending on the application and the type of load, the solid-state relay output must meet various requirements. The following are crucial:
- Power amplification
- Matching the switching voltage and the switching current (AC/DC)
- Short-circuit protection

For these different applications, the solid-state relay element must also be processed using additional electronics on the output side.

Figure 2: block diagram for AC input

AC output

The solid-state relay element requires a stable control voltage to ensure reliable operation. In the case of the AC input, this is achieved by connecting a rectifier and filter capacitor upstream. Rectifying is followed, in principle, by the same circuit architecture as the DC input.

Figure 3: 2-conductor output

Figure 4: 3-conductor output

DC output

In order to achieve the necessary output power, the solid-state relay element is supplemented by one or more semiconductor components.

The on-site user should nevertheless simply regard the connection terminal blocks of the output as conventional switch connections. Observing the specified polarity is the only essential requirement.

For practical reasons, the following criteria should be taken into account when selecting a suitable solid-state relay:
1. Operating voltage range (e.g., 12 ... 60 V DC)
   This determines the minimum or maximum voltage to be switched. The lower value must be observed in order to ensure reliable operation. In order to protect the output transistor, the upper value must not be exceeded.
2. Maximum continuous current (e.g., 1 A)
   This value indicates the maximum continuous current. If this value is exceeded continuously, the output semiconductor will be destroyed. The dependence of the output current on the ambient temperature of the solid-state relay should also be taken into consideration. A derating curve is therefore generally specified for solid-state power relays. This shows the maximum load current as a function of the ambient temperature.

Output circuit

The 2-conductor output is similar to a mechanical contact. Only the polarity of the connections is specified and must be observed.

The 3-conductor output is non-isolated and requires both potentials from the voltage source on the output side to be connected if it is to operate reliably.

When switched off, a permanent reference to ground (negative potential) is established. In addition, this output circuit offers the advantage of an almost constant internal resistance.

AC output

In order to control the switching and control devices for AC voltage, a semiconductor for AC voltage (TRIAC or thyristor) is connected downstream of the solid-state relay element.

As with the DC output, it is particularly important to consider the maximum operating voltage range and the maximum continuous load current as a function of the ambient temperature.
In addition, the maximum peak reverse voltage of the TRIAC (e.g., 600 V) is crucial with AC outputs. This must not be exceeded even in the case of voltage fluctuations or interference voltage peaks in order to prevent destruction. That is why the AC outputs of all solid-state relays from Phoenix Contact have an internal RC protective circuit to protect against interference voltage peaks.

**Protective circuits**

The moment inductive loads (contactors, solenoid valves, motors) are switched off, surge voltages occur and these can reach very high amplitudes. Electronic components and switching elements are particularly susceptible to these. A protective circuit should therefore always be provided to prevent destruction.

A parallel connection to the load effectively reduces the switching surge voltage to a harmless level. Depending on the solid-state relay output and type of load:

- A freewheeling diode-suppressor diode (DC only)
- A varistor (AC and DC)
- Or an RC element (AC only)

can provide the necessary protection.

**Application notes**

Input solid-state relays acting in the direction from the I/O devices to the controller (signaling, controlling, monitoring)

Plug-in version:
- PLC-O...

Modular version:
- DEK-OE...
- EMG 10-OE...
- SIM-EI...
- OPT...

Output (power) solid-state relays acting in the direction from the controller to the I/O devices (switching, amplifying, controlling)

Plug-in version:
- PLC-O...

Modular version:
- DEK-OV...
- EMG 10-OV
- EMG 12-OV
- EMG 17-OV
- OV...
- OPT...

**Remarks:**

1) Ground (negative) potential from the input and output of the solid-state relay must not be connected.
2) DC loads must be provided with an effective protective circuit (e.g., diode).
3) AC loads must be protected with a varistor or an RC element.
RIFLINE complete is an inexpensive relay system with various accessories. It consists of DIN rail bases, electromechanical or solid-state relays, plug-in input/interference suppression modules, marking material, and bridging material. The range of accessories is rounded off with a timer module. This can be used to transform a basic relay into a timer relay with three different functions.

The RIFLINE complete relay range consists of seven different base versions from RIF-0 to RIF-4 – these range from one N/O contact up to four PDT contacts. The field of application of this product group ranges from coupling relay applications with switching currents of one milliamp to replacement for miniature contactors with currents up to 16 A.

The relay bases feature push-in connection technology, which enables quick and tool-free conductor contacting. The RIF-1 to RIF-4 bases offer double the contact options on both the input and output side.

On the input side of all bases, the negative potential (A2) can be bridged – regardless of the base size. On the output side, the grouped contact (11) can be bridged within the RIF-0 base version. This connection can also be bridged within the RIF-1 base size.

To offer diverse marking options, the engagement lever can be fitted with a zack marker strip. In addition, marker carriers can be mounted on the bases so that additional marking surfaces are available.

RIFLINE complete can be extended using many elements from the CLIPLINE complete accessories range. This includes marking material, bridges, and test adapters.

To make ordering and management easy, RIFLINE complete modules are provided in the most popular voltages as complete modules with relay and input/interference suppression module. For individual assembly, tailored to the requirements of the application, additional voltage levels are offered in the modular system.
RIF-0
The narrow 6.2 mm RIF-0 base series is designed for miniature relays with one contact. Switching currents up to 6 A are implemented here. Two base versions are available: 1 N/O contact and 1 PDT contact. RIF-0 is therefore a good choice for all coupling applications.

RIF-1
The narrow 16 mm RIF-1 base series is designed for miniature relays with 2 contacts. Currents up to 13 A can be switched when using the FBS 2-8 plug-in bridge. This is the ideal relay for applications that require coupling, power switching, and signal duplication.

RIF-2
The 31 mm wide RIF-2 base series is designed for industrial relays with up to 4 contacts. Currents up to 12 A are no problem for these bases. This relay is ideal for applications that require power and signal multiplication.

RIF-3
The 40 mm wide RIF-3 base series is designed for octal relays with up to 3 contacts. Switching currents up to 10 A can be implemented here. Two base versions are available: 2 PDT contacts and 3 PDT contacts. RIF-3 bases are ideal for all applications that require power and signal multiplication.

RIF-4
The 43 mm wide RIF-4 base series is designed for power relays with up to 3 contacts. Currents up to 16 A can be switched. RIF-4 bases are a good choice for applications that require power and signal multiplication, e.g., in miniature contactor applications.

Accessories
A wide range of accessories are available for the RIFLINE complete relay system that round off the range. These include bridges, professional marking material, special function modules, test plugs, and end brackets.
Relay modules

RIFLINE complete

Modular RIF-0 relay base

Relay base that can be fitted with miniature power relays or solid-state relays with a nominal voltage of 12 to 24 V DC.

The advantages:
- Integrated freewheeling diode for input circuit and interference suppression circuit
- LED for status display
- Safe isolation according to DIN EN 50178 between coil and contact
- Professional marking material
- Holders for test plugs
- Professional bridging of adjacent modules saves wiring time (A2 and 11/13)
- FBS 2-6 plug-in bridges for the input and output side

Notes:
- Type of insulating housing: Polyamide PA non-reinforced, color: gray.
- For further marking systems and mounting material, see Catalog 5.

Technical data

<table>
<thead>
<tr>
<th>Nominal voltage $U_{\text{N}}$</th>
<th>230 V AC (Contact side)</th>
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<tbody>
<tr>
<td>Nominal current at $U_{\text{N}}$ max.</td>
<td>8 A (Depends on application/assembly)</td>
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</tbody>
</table>

General data

<table>
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<tr>
<th>Ambient temperature (operation)</th>
<th>-40°C ... 85°C (Depends on application/assembly)</th>
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</thead>
<tbody>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16</td>
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</table>

Dimensions

| Width | 6.2 mm |
| Depth | 78 mm |
| Height | 93 mm |

Ordering data

<table>
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<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
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<tbody>
<tr>
<td>RIF-0 relay base, PDT version, safe isolation I/O With push-in connection</td>
<td>RIF-0-BPT/21</td>
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Accessories

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<td>2-pos. red</td>
<td>3030336 50</td>
</tr>
<tr>
<td>2-pos. blue</td>
<td>3036932 50</td>
</tr>
<tr>
<td>2-pos. gray</td>
<td>3032237 50</td>
</tr>
<tr>
<td>5-pos. red</td>
<td>3030349 50</td>
</tr>
<tr>
<td>10-pos. red</td>
<td>3030271 10</td>
</tr>
<tr>
<td>20-pos. red</td>
<td>3030365 10</td>
</tr>
<tr>
<td>50-pos. red</td>
<td>3032224 10</td>
</tr>
</tbody>
</table>

| End clamp, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8/27, KLM... | |
| Test plug, consisting of: | |
| Insulating sleeve, for MPS metal part | |
| red | |
| white | |
| blue | |
| yellow | |
| green | |
| gray | |
| black | |

Zack marker strip, 10-section, unprinted: pack contains enough to label 100 terminal blocks

<table>
<thead>
<tr>
<th>10-section</th>
<th>Order No.</th>
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<tr>
<td>ZB 6:UNBEDRUCKT</td>
<td>1051003 10</td>
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</table>
Relay modules
RIFLINE complete

Technical data
230 V AC
max. 8 A (Depends on application/assembly)

-40°C ... 85°C (Depends on application/assembly)
0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16

6.2 mm
66 mm
93 mm

Ordering data

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Accessories

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<td>FBS 2-6 GY</td>
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<tr>
<td>FBS 5-6</td>
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<td>FBS 10-6</td>
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<td>CLIPFIX 35</td>
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<td>MPS-MT</td>
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<td>MPS-IH RD</td>
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<td>MPS-IH WH</td>
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<td>ZB 6-UNBEDRUCKT</td>
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</tr>
</tbody>
</table>

1 N/O contact relay base for miniature power relay
Plug-in miniature power relays suitable for RIF-0 and PLC-INTERFACE relay bases.

The advantages:
- Power contacts up to 6 A
- Multi-layer gold contact or power contact
- High degree of protection RT III (comparable with IP67)
- Safe isolation according to DIN EN 50178 between coil and contact
- Can be soldered in on PCB

Notes:
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

For dimensional drawings and perforations for assembly, see page 544

<table>
<thead>
<tr>
<th>Input data</th>
<th>①</th>
<th>②</th>
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</thead>
<tbody>
<tr>
<td>Permissible range (with reference to $U_n$)</td>
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<td></td>
</tr>
<tr>
<td>Typ. input current at $U_n$</td>
<td>mA</td>
<td>mA</td>
</tr>
<tr>
<td>Typ. response time at $U_n$</td>
<td>ms</td>
<td>ms</td>
</tr>
<tr>
<td>Typ. release time at $U_n$</td>
<td>ms</td>
<td>ms</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Output data</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Contact type</td>
<td>Single contact, 1-PDT</td>
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<tr>
<td>Contact material</td>
<td>Single contact, 1-PDT</td>
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<tr>
<td>Max. switching voltage</td>
<td>AgSnO, hard gold-plated</td>
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<tr>
<td>Min. switching voltage</td>
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<td>5 V (at 100 mA)</td>
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<td>100 mV (at 10 mA)</td>
<td>30 V AC / 36 V DC</td>
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<tr>
<td>Limiting continuous current</td>
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<td>Max. inrush current (on request)</td>
<td>50 mA</td>
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<tr>
<td>Min. switching current</td>
<td>10 mA (at 12 V)</td>
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<tr>
<td>1 mA (at 24 V)</td>
<td>10 mA</td>
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<tr>
<td>General data</td>
<td>4 kV AC (50 Hz, 1 min.)</td>
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<tr>
<td>Test voltage (winding / contact)</td>
<td>-40°C ... 85°C</td>
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<tr>
<td>Ambient temperature (operation)</td>
<td>2 x 10⁷ cycles</td>
</tr>
<tr>
<td>Nominal operating mode</td>
<td>100% operating factor</td>
</tr>
<tr>
<td>Mechanical service life</td>
<td>5 mm / 28 mm / 15 mm</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>Any / In rows with zero spacing</td>
</tr>
<tr>
<td>Mounting position/mounting</td>
<td>IEC 60664, EN 50178, IEC 62103</td>
</tr>
<tr>
<td>Dimensions W / H / D</td>
<td>5 mm / 28 mm / 15 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ordering data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Input voltage $U_n$</td>
</tr>
<tr>
<td>Plug-in miniature power relays</td>
<td>12 V DC</td>
</tr>
<tr>
<td>with power contact</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Plug-in miniature power relays</td>
<td>12 V DC</td>
</tr>
<tr>
<td>with gold contact</td>
<td>24 V DC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-MR- 12DC/21</td>
<td>2961150</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 12DC/21AU</td>
<td>2961163</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 24DC/21</td>
<td>2961105</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 24DC/21AU</td>
<td>2961121</td>
<td>10</td>
</tr>
</tbody>
</table>
Plug-in solid-state relays suitable for RIF-0 and PLC-INTERFACE relay bases.

The advantages:
- Switching capacity of up to 24 V DC/3 A
- RT III wash tight (comparable to IP67)
- Vibration- and shock-resistant
- Wear-free and long-lasting
- Zero voltage switch at AC output
- Can be soldered in on PCB

**Technical data**

<table>
<thead>
<tr>
<th>Input data</th>
<th>Output data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to ( U_{\text{UN}} ))</td>
<td>Max. switching voltage</td>
</tr>
<tr>
<td>0.8 - 1.2</td>
<td>33 V DC</td>
</tr>
<tr>
<td>Switching level</td>
<td>Min. switching voltage</td>
</tr>
<tr>
<td>1 signal (&quot;H&quot;) [V DC] ( \geq ) 16</td>
<td>3 V DC</td>
</tr>
<tr>
<td>0 signal (&quot;L&quot;) [V DC] ( \leq ) 10</td>
<td>Min. load current</td>
</tr>
<tr>
<td>Typ. input current at ( U_{\text{UN}} ) [mA]</td>
<td>7</td>
</tr>
<tr>
<td>Typ. switch-on time at ( U_{\text{UN}} ) [µs]</td>
<td>20</td>
</tr>
<tr>
<td>Typ. switch-off time at ( U_{\text{UN}} ) [µs]</td>
<td>300</td>
</tr>
<tr>
<td>Transmission frequency ( f_{\text{lim}} ) [Hz]</td>
<td>300</td>
</tr>
</tbody>
</table>

**Output data**

<table>
<thead>
<tr>
<th>Limiting continuous current 3 A (see derating curve)</th>
<th>Min. inrush current 15 A (10 ms)</th>
</tr>
</thead>
</table>

**General data**

<table>
<thead>
<tr>
<th>Rated surge voltage Basic insulation</th>
<th>Test voltage input/output 2.5 kV (50 Hz, 1 min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature (operation) -25°C - 60°C</td>
<td>Nominal operating factor 100% operating factor</td>
</tr>
<tr>
<td>Nominal operating mode 2/III</td>
<td>Standards/regulations IEC 60664, EN 50178, IEC 62103</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category - Not specified</td>
<td>Mounting position/mounting Any / In rows with zero spacing</td>
</tr>
<tr>
<td>Dimensions W / H / D 5 mm / 28 mm / 15 mm</td>
<td>Mounting position/mounting 5 mm / 28 mm / 15 mm</td>
</tr>
</tbody>
</table>

**Ordering data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage ( U_{\text{UN}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in solid-state relays</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Solid-state power relays</td>
<td></td>
</tr>
<tr>
<td>Solid-state input relays</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT-24DC/ 24DC/ 2</td>
<td>2966595</td>
<td>10</td>
</tr>
</tbody>
</table>

Notes:
For dimensional drawings and perforations for assembly, see page 345
Max. DC voltage output of 100 mA

Max. AC voltage output of 750 mA

**Technical data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<tbody>
<tr>
<td>OPT-24DC/48DC/100</td>
<td>2966618</td>
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**Ordering data**

<table>
<thead>
<tr>
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<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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</thead>
<tbody>
<tr>
<td>OPT-24DC/230AC/1</td>
<td>2967950</td>
<td>10</td>
</tr>
</tbody>
</table>
Relay modules

RIFLINE complete

Modular RIF-1 relay base

Relay base that can be fitted with 1 or 2 PDT relays or solid-state relays.
Range of accessories includes:
– Plug-in input and interference suppression module
– Plug-in timer module
– Relay retaining bracket with ejector function and holder for marking material
– Comprehensive range of marking material
– Test plug
– FBS 2-6 plug-in bridges for the input side (A2)
– FBS 2-8 plug-in bridges for the output side (11/21)

Notes:
Type of insulating housing: Polyamide PA non-reinforced, color: gray.
For further marking systems and mounting material, see Catalog 5.

Technical data

<table>
<thead>
<tr>
<th>Nominal voltage U&lt;sub&gt;N&lt;/sub&gt;</th>
<th>230 V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal current at U&lt;sub&gt;N&lt;/sub&gt; max.</td>
<td>13 A (Depends on application/assembly)</td>
</tr>
</tbody>
</table>

General data

<table>
<thead>
<tr>
<th>Ambient temperature (operation)</th>
<th>-40°C ... 85°C (Depends on application/assembly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16</td>
</tr>
</tbody>
</table>

Dimensions

<table>
<thead>
<tr>
<th>Width</th>
<th>16 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth with retaining bracket</td>
<td>75 mm</td>
</tr>
<tr>
<td>Height</td>
<td>93 mm</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-1 relay base, plug-in option for input/interference suppression module, safe isolation I/O with push-in connection</td>
<td>RIF-1-BPT/2X21</td>
<td>2900931</td>
<td>10</td>
</tr>
<tr>
<td>Relay retaining bracket, with ejector function and holder for marking material, suitable for RIF-1 relay base</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Plug-in bridge</th>
<th>FBS 2-6</th>
<th>3030336</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-pos. red</td>
<td>FBS 2-6 BU</td>
<td>3036932</td>
<td>50</td>
</tr>
<tr>
<td>2-pos. blue</td>
<td>FBS 2-6 GY</td>
<td>3032237</td>
<td>50</td>
</tr>
<tr>
<td>2-pos. gray</td>
<td>FBS 2-8</td>
<td>3030284</td>
<td>10</td>
</tr>
<tr>
<td>2-pos. red</td>
<td>FBS 2-8 BU</td>
<td>3032567</td>
<td>10</td>
</tr>
<tr>
<td>2-pos. blue</td>
<td>FBS 2-8 GY</td>
<td>3032541</td>
<td>10</td>
</tr>
<tr>
<td>2-pos. gray</td>
<td>CLIPFIX 35</td>
<td>3022218</td>
<td>50</td>
</tr>
<tr>
<td>End clamp, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8, 27, KLM...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test plug, consisting of:</td>
<td>MPS-MT</td>
<td>0201744</td>
<td>10</td>
</tr>
<tr>
<td>Metal part for 2.3 mm Ø socket hole and</td>
<td>MPS-IH RD</td>
<td>0201676</td>
<td>10</td>
</tr>
<tr>
<td>Insulating sleeve, for MPS metal part</td>
<td>MPS-IH WH</td>
<td>0201663</td>
<td>10</td>
</tr>
<tr>
<td>red</td>
<td>MPS-IH BU</td>
<td>0201689</td>
<td>10</td>
</tr>
<tr>
<td>white</td>
<td>MPS-IH YE</td>
<td>0201692</td>
<td>10</td>
</tr>
<tr>
<td>blue</td>
<td>MPS-IH GN</td>
<td>0201702</td>
<td>10</td>
</tr>
<tr>
<td>yellow</td>
<td>MPS-IH GY</td>
<td>0201728</td>
<td>10</td>
</tr>
<tr>
<td>green</td>
<td>MPS-IH BK</td>
<td>0201731</td>
<td>10</td>
</tr>
<tr>
<td>gray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zack marker strip, unprinted</td>
<td>ZB 5 UNBEDRUCKT</td>
<td>1050004</td>
<td>10</td>
</tr>
<tr>
<td>10-section</td>
<td>ZB 15 UNBEDRUCKT</td>
<td>0811972</td>
<td>10</td>
</tr>
<tr>
<td>5-section</td>
<td>STP 5-2</td>
<td>0800967</td>
<td>100</td>
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</table>
### Technical data

- [ ]

- [ ]

- [ ]

- [ ]

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-RH-1</td>
<td>2900953</td>
<td>10</td>
</tr>
</tbody>
</table>

### Accessories

- [ ]

- [ ]

- [ ]
Plug-in miniature power relays

Plug-in miniature power relays with 1 or 2 PDT contacts, suitable for RIF-1, PR1, and PLC-INTERFACE relay bases.

The advantages:
- Power contacts up to 16 A
- Multi-layer gold contact or power contact
- High degree of protection up to RT III (comparable with IP67) depending on type

Notes:
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

Technical data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage Un</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in miniature power relays</td>
<td></td>
<td>REL-MR- 12DC/21HC</td>
<td>2961309</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>12 V DC</td>
<td>REL-MR- 24DC/21HC</td>
<td>2961312</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>24 V DC</td>
<td>REL-MR- 48DC/21HC</td>
<td>2834821</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>60 V DC</td>
<td>REL-MR- 60DC/21HC</td>
<td>2961325</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>110 V DC</td>
<td>REL-MR- 110DC/21HC</td>
<td>2961338</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>24 V AC</td>
<td>REL-MR- 24AC/21HC</td>
<td>2961406</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>48 V AC</td>
<td>REL-MR- 230AC/21HC</td>
<td>2961422</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>120 V AC</td>
<td>REL-MR-120AC/21HC</td>
<td>2961503</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>230 V AC</td>
<td>REL-MR-230AC/21HC</td>
<td>2961529</td>
<td>10</td>
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</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage Un</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<tbody>
<tr>
<td>Plug-in miniature power relays</td>
<td></td>
<td>REL-MR- 12DC/21HC AU</td>
<td>2961532</td>
<td>10</td>
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<tr>
<td>with gold contact</td>
<td>12 V DC</td>
<td>REL-MR- 24DC/21HC AU</td>
<td>2961545</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>24 V DC</td>
<td>REL-MR- 48DC/21HC AU</td>
<td>2961558</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>48 V DC</td>
<td>REL-MR- 60DC/21HC AU</td>
<td>2961571</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>60 V DC</td>
<td>REL-MR- 110DC/21HC AU</td>
<td>2961584</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>110 V DC</td>
<td>REL-MR- 24AC/21HC AU</td>
<td>2961650</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>24 V AC</td>
<td>REL-MR- 120AC/21HC AU</td>
<td>2961565</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>120 V AC</td>
<td>REL-MR-230AC/21HC AU</td>
<td>2961588</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>230 V AC</td>
<td>REL-MR- 230AC/21HC AU</td>
<td>2961571</td>
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</table>

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage Un</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
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<tbody>
<tr>
<td>Plug-in miniature power relays</td>
<td></td>
<td>REL-MR- 12DC/21HC</td>
<td>2961309</td>
<td>10</td>
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<tr>
<td>with power contact</td>
<td>12 V DC</td>
<td>REL-MR- 24DC/21HC</td>
<td>2961312</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>24 V DC</td>
<td>REL-MR- 48DC/21HC</td>
<td>2834821</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>60 V DC</td>
<td>REL-MR- 60DC/21HC</td>
<td>2961325</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>110 V DC</td>
<td>REL-MR- 110DC/21HC</td>
<td>2961338</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>24 V AC</td>
<td>REL-MR- 24AC/21HC</td>
<td>2961406</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>48 V AC</td>
<td>REL-MR- 230AC/21HC</td>
<td>2961422</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>120 V AC</td>
<td>REL-MR-120AC/21HC</td>
<td>2961503</td>
<td>10</td>
</tr>
<tr>
<td>with power contact</td>
<td>230 V AC</td>
<td>REL-MR-230AC/21HC</td>
<td>2961529</td>
<td>10</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage Un</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in miniature power relays</td>
<td></td>
<td>REL-MR- 12DC/21HC AU</td>
<td>2961532</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>12 V DC</td>
<td>REL-MR- 24DC/21HC AU</td>
<td>2961545</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>24 V DC</td>
<td>REL-MR- 48DC/21HC AU</td>
<td>2961558</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>48 V DC</td>
<td>REL-MR- 60DC/21HC AU</td>
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<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>60 V DC</td>
<td>REL-MR- 110DC/21HC AU</td>
<td>2961584</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>110 V DC</td>
<td>REL-MR- 24AC/21HC AU</td>
<td>2961650</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>24 V AC</td>
<td>REL-MR- 120AC/21HC AU</td>
<td>2961565</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>120 V AC</td>
<td>REL-MR-230AC/21HC AU</td>
<td>2961588</td>
<td>10</td>
</tr>
<tr>
<td>with gold contact</td>
<td>230 V AC</td>
<td>REL-MR- 230AC/21HC AU</td>
<td>2961571</td>
<td>10</td>
</tr>
</tbody>
</table>
Plug-in miniature power relays

Plug-in miniature power relays with 1 or 2 PDT contacts, suitable for RIF-1 and PR1 relay bases.

The advantages:
- Switching current of up to 16 A
- With lockable manual operation
- Mechanical switch position indicator
- Integrated status LED
- Multi-layer gold contact or power contact
- DC types with integrated freewheeling diode
- Can be soldered in on PCB

Notes:
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

---

Technical data

<table>
<thead>
<tr>
<th>Contact type</th>
<th>Single contact, 1-PDT</th>
<th>Single contact, 1-PDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact material</td>
<td>AgNi</td>
<td>AgNi hard gold-plated</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>250 V AC/DC</td>
<td>30 V AC / 36 V DC</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>12 V (at 10 mA)</td>
<td>12 V (at 1 mA)</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>16 A</td>
<td>50 mA</td>
</tr>
<tr>
<td>Min. inrush current, AC</td>
<td>32 A (20 ms)</td>
<td>50 mA</td>
</tr>
<tr>
<td>Min. inrush current, DC</td>
<td>32 A (20 ms)</td>
<td>50 mA</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>10 mA (at 12 V)</td>
<td>1 mA (at 12 V)</td>
</tr>
<tr>
<td>General data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test voltage (winding / contact)</td>
<td>5 kV AC (50 Hz, 1 min.)</td>
<td></td>
</tr>
<tr>
<td>Test voltage (contact/contact)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature (operation), AC</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature (operation), DC</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Mechanical service life, AC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical service life, DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standards/regulations</td>
<td></td>
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Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-MR-24DC/21HC/MS</td>
<td>2987888</td>
<td>10</td>
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<tr>
<td>REL-MR-24AC/21HC/MS</td>
<td>2987891</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-120AC/21HC/MS</td>
<td>2987890</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-230AC/21HC/MS</td>
<td>2987914</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-24DC/21HC AU/MS</td>
<td>2987927</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-230AC/21HC AU/MS</td>
<td>2987930</td>
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Ordering data

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<tr>
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<td>2987843</td>
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<tr>
<td>REL-MR-24AC/21-21/MS</td>
<td>2987956</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-120AC/21-21/MS</td>
<td>2987959</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-230AC/21-21/MS</td>
<td>2987972</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-24DC/21-21AU/MS</td>
<td>2987985</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-230AC/21-21AU/MS</td>
<td>2987998</td>
<td>10</td>
</tr>
</tbody>
</table>
REL-MR...21HC...MS (1 PDT)

Operating voltage range

Interruption rating

Electrical service life

Service life reduction factor with various cos phi

REL-MR...21-21...MS (2 PDTs)

Operating voltage range

Interruption rating

Electrical service life

Service life reduction factor with various cos phi
Relay modules

RIFLINE complete

Plug-in solid-state relays

Plug-in solid-state relays suitable for RIF-1, PR1, and PLC-INTERFACE relay bases.

The advantages:
– Switching capacity of up to 24 V DC/5 A
– RT III wash tight (comparable to IP67)
– Vibration- and shock-resistant
– Wear-free and long-lasting
– Zero voltage switch at AC output
– Can be soldered in on PCB

### Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>①</th>
<th>②</th>
<th>③</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to $U_{in}$)</td>
<td>0.8 - 1.2</td>
<td>0.8 - 1.2</td>
<td>0.9 - 1.1</td>
</tr>
<tr>
<td>Switching level</td>
<td>1 V signal (&quot;H&quot;) [V DC] ≥ 2.5</td>
<td>16</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>0 V signal (&quot;L&quot;) [V DC] ≤ 0.8</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Typ. input current at $U_{in}$ [mA]</td>
<td>9</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Typ. switch-on time at $U_{in}$ [µs]</td>
<td>10</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Typ. switch-off time at $U_{in}$ [µs]</td>
<td>400</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Transmission frequency $f_{lim}$ [Hz]</td>
<td>300</td>
<td>300</td>
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<table>
<thead>
<tr>
<th>Output data</th>
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</thead>
<tbody>
<tr>
<td>Max. switching voltage</td>
</tr>
<tr>
<td>Min. switching voltage</td>
</tr>
<tr>
<td>Limiting continuous current</td>
</tr>
<tr>
<td>Min. load current</td>
</tr>
<tr>
<td>Max. inrush current</td>
</tr>
<tr>
<td>Leakage current in off state</td>
</tr>
<tr>
<td>Phase angle (cos $\phi$)</td>
</tr>
<tr>
<td>Output circuit</td>
</tr>
<tr>
<td>Max. load value</td>
</tr>
<tr>
<td>Output protection</td>
</tr>
<tr>
<td>Voltage drop at max. limiting continuous current</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated surge voltage</td>
</tr>
<tr>
<td>Test voltage input/output</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
</tr>
<tr>
<td>Nominal operating mode</td>
</tr>
<tr>
<td>Standards/regulations</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category</td>
</tr>
<tr>
<td>Mounting position/mounting</td>
</tr>
<tr>
<td>Dimensions W / H / D</td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_{in}$</th>
</tr>
</thead>
</table>
| Plug-in solid-state relays | 5 V DC
| | 24 V DC
| | 60 V DC

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT- 5DC/ 24DC/</td>
<td>2982113</td>
<td>10</td>
</tr>
<tr>
<td>OPT-24DC/ 24DC/ 5</td>
<td>2982100</td>
<td>10</td>
</tr>
<tr>
<td>OPT-60DC/ 24DC/ 5</td>
<td>2982126</td>
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</tbody>
</table>

Notes:
For dimensional drawings and perforations for assembly, see page 345
Max. AC voltage output of 2 mA

Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs./Pkt.</th>
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</thead>
<tbody>
<tr>
<td>OPT-5DC/230AC/2</td>
<td>2982168</td>
<td>10</td>
</tr>
<tr>
<td>OPT-24DC/230AC/2</td>
<td>2982171</td>
<td>10</td>
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<tr>
<td>OPT-60DC/230AC/2</td>
<td>2982184</td>
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</tr>
</tbody>
</table>

Derating curve for OPT...DC/24DC/5 solid-state relays

Derating curve for OPT...DC/230AC/2 solid-state relays

Ordering data
**Relay modules**

**RIFLINE complete**

**Modular RIF-2 relay base**

Relay base that can be fitted with 2 or 4 PDT relays.

Range of accessories includes:
- Plug-in input and interference suppression module
- Plug-in timer module
- Relay retaining bracket with ejector function and holder for marking material
- Comprehensive range of marking material
- Test plug
- FBS 2-6 plug-in bridges for the input side (A2)

---

Notes:

Type of insulating housing:
Polyamide PA non-reinforced, color: gray.

For further marking systems and mounting material, see Catalog 5.

---

**Technical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage $U_{N}$</td>
<td>250 V AC</td>
</tr>
<tr>
<td>Nominal current at $U_{N}$</td>
<td>max. 12 A (Depends on application/assembly)</td>
</tr>
<tr>
<td>General data</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-40°C ... 85°C (Depends on application/assembly)</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16</td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>31 mm</td>
</tr>
<tr>
<td>Depth with retaining bracket</td>
<td>75 mm</td>
</tr>
<tr>
<td>Height</td>
<td>93 mm</td>
</tr>
</tbody>
</table>

---

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs / Pkt</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-2 relay base, plug-in option for input/interference suppression module, safe isolation I/O with push-in connection</td>
<td>RIF-2-BPT/4X21</td>
<td>2900934 10</td>
</tr>
<tr>
<td>Relay retaining bracket, with ejector function and holder for marking material, suitable for RIF-2 relay base</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plug-in bridge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-pos. red</td>
<td>FBS 2-6</td>
<td>3030336 50</td>
</tr>
<tr>
<td>2-pos. blue</td>
<td>FBS 2-6 BU</td>
<td>3036932 50</td>
</tr>
<tr>
<td>2-pos. gray</td>
<td>FBS 2-6 GY</td>
<td>3032237 50</td>
</tr>
<tr>
<td>End clamp, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8, KLM...</td>
<td>CLIPFIX 35</td>
<td>3022218 50</td>
</tr>
<tr>
<td>Test plug, consisting of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal part for 2.3 mm Ø socket hole and</td>
<td>MPS-MT</td>
<td>0201744 10</td>
</tr>
<tr>
<td>Insulating sleeve, for MPS metal part</td>
<td>MPS-IH RD</td>
<td>0201676 10</td>
</tr>
<tr>
<td>red</td>
<td>MPS-IH WH</td>
<td>0201689 10</td>
</tr>
<tr>
<td>white</td>
<td>MPS-IH YE</td>
<td>0201692 10</td>
</tr>
<tr>
<td>blue</td>
<td>MPS-IH GN</td>
<td>0201702 10</td>
</tr>
<tr>
<td>yellow</td>
<td>MPS-IH GY</td>
<td>0201728 10</td>
</tr>
<tr>
<td>green</td>
<td>MPS-IH BK</td>
<td>0201731 10</td>
</tr>
<tr>
<td>gray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>black</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zack marker strip, unprinted</td>
<td>ZB 5 :UNBEDRUCKT</td>
<td>1050004 10</td>
</tr>
<tr>
<td>10-section</td>
<td>ZB 15 :UNBEDRUCKT</td>
<td>0811972 10</td>
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<tr>
<td>Double marker carrier for ZB 5</td>
<td>STP 5-2</td>
<td>0800967 100</td>
</tr>
</tbody>
</table>

---

**Accessories**

**Acknowledgments**

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
### Technical data

- max. 12 A (Depends on application/assembly)
- Ambient temperature (operation) -40°C ... 85°C (Depends on application/assembly)
- Connection data solid / stranded / AWG 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-RH-2</td>
<td>2900954</td>
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</tbody>
</table>

### Accessories

- 
- 
- 
-
### Plug-in industrial relays

Plug-in industrial relays with 2 or 4 PDT contacts, suitable for RIF-2 and PR2 relay bases.

The advantages:
- Detectable manual operation
- Mechanical switch position indicator
- Integrated status LED
- Multi-layer gold contact or power contact
- DC types with integrated freewheeling diode

**Notes:**
For other voltages, see www.phoenixcontact.net/products

#### Technical data

<table>
<thead>
<tr>
<th>Permissible range (with reference to UN)</th>
<th>Typ. input current at UN</th>
<th>Typ. response time at UN</th>
<th>Typ. release time at UN</th>
<th>Typ. release time at UN (depending on phase relation)</th>
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<tbody>
<tr>
<td>---</td>
<td>[mA]</td>
<td>[ms]</td>
<td>[ms]</td>
<td>[ms]</td>
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<tr>
<td>①</td>
<td>78</td>
<td>13</td>
<td>14</td>
<td>14</td>
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<tr>
<td>②</td>
<td>41</td>
<td>13</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>③</td>
<td>22</td>
<td>13</td>
<td>14</td>
<td>14</td>
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<td>④</td>
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<td>⑤</td>
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<td>⑥</td>
<td>70</td>
<td>5 - 15</td>
<td>5 - 20</td>
<td>5 - 20</td>
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<tr>
<td>⑦</td>
<td>13</td>
<td>5 - 15</td>
<td>5 - 20</td>
<td>5 - 20</td>
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<tr>
<td>⑧</td>
<td>6.5</td>
<td>5 - 20</td>
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#### Ordering data

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<th>Input voltage</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<tbody>
<tr>
<td>Plug-in industrial relays, with power contacts</td>
<td></td>
<td>REL-IR2/LDP- 12DC/2X21</td>
<td>2903659</td>
<td>10</td>
</tr>
<tr>
<td>With freewheeling diode</td>
<td>① 12 V DC</td>
<td>REL-IR2/LDP- 24DC/2X21</td>
<td>2903660</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>② 24 V DC</td>
<td>REL-IR2/LDP- 48DC/2X21</td>
<td>2903661</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>③ 48 V DC</td>
<td>REL-IR2/LDP- 60DC/2X21</td>
<td>2903662</td>
<td>10</td>
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<tr>
<td></td>
<td>④ 60 V DC</td>
<td>REL-IR2/LDP- 110DC/2X21</td>
<td>2903663</td>
<td>10</td>
</tr>
<tr>
<td>Plug-in industrial relays, with multi-layer gold contacts</td>
<td></td>
<td>REL-IR2/L-24AC/2X21</td>
<td>2903666</td>
<td>10</td>
</tr>
<tr>
<td>With freewheeling diode</td>
<td>① 12 V DC</td>
<td>REL-IR2/L-230AC/2X21</td>
<td>2903668</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>② 24 V AC</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>③ 120 V AC</td>
<td></td>
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<tr>
<td></td>
<td>④ 230 V AC</td>
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#### Standards/regulations

- IEC 60664

**Ordering data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in industrial relays, with power contacts</td>
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<td>REL-IR4/LDP- 12DC/4X21</td>
<td>2903676</td>
<td>10</td>
</tr>
<tr>
<td>With freewheeling diode</td>
<td>① 12 V DC</td>
<td>REL-IR4/LDP- 24DC/4X21</td>
<td>2903677</td>
<td>10</td>
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<tr>
<td></td>
<td>② 24 V DC</td>
<td>REL-IR4/LDP- 48DC/4X21</td>
<td>2903678</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>③ 48 V DC</td>
<td>REL-IR4/LDP- 60DC/4X21</td>
<td>2903679</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>④ 60 V DC</td>
<td>REL-IR4/LDP- 110DC/4X21</td>
<td>2903680</td>
<td>10</td>
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<tr>
<td>Plug-in industrial relays, with multi-layer gold contacts</td>
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<td>REL-IR4/L-24AC/4X21</td>
<td>2903684</td>
<td>10</td>
</tr>
<tr>
<td>With freewheeling diode</td>
<td>① 12 V DC</td>
<td>REL-IR4/L-230AC/4X21</td>
<td>2903688</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>② 24 V AC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>③ 120 V AC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>④ 230 V AC</td>
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**Ordering data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in industrial relays, with power contacts</td>
<td></td>
<td>REL-IR4/LDP- 12DC/4X21AU</td>
<td>2903699</td>
<td>10</td>
</tr>
<tr>
<td>With freewheeling diode</td>
<td>① 12 V DC</td>
<td>REL-IR4/LDP- 24DC/4X21AU</td>
<td>2903700</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>② 24 V DC</td>
<td>REL-IR4/LDP- 48DC/4X21AU</td>
<td>2903701</td>
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</tr>
<tr>
<td></td>
<td>③ 48 V DC</td>
<td>REL-IR4/LDP- 60DC/4X21AU</td>
<td>2903702</td>
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<tr>
<td></td>
<td>④ 60 V DC</td>
<td>REL-IR4/LDP- 110DC/4X21AU</td>
<td>2903703</td>
<td>10</td>
</tr>
<tr>
<td>Plug-in industrial relays, with multi-layer gold contacts</td>
<td></td>
<td>REL-IR4/L-24AC/4X21AU</td>
<td>2903704</td>
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</tr>
<tr>
<td>With freewheeling diode</td>
<td>① 12 V DC</td>
<td>REL-IR4/L-230AC/4X21AU</td>
<td>2903705</td>
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</tr>
<tr>
<td></td>
<td>② 24 V AC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>③ 120 V AC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>④ 230 V AC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
REL-IR2... (2 PDTs)

Operating voltage range

Interrupting rating

Electrical service life

Service life reduction factor

REL-IR4... (4 PDTs)

Operating voltage range

Interrupting rating

Electrical service life

Service life reduction factor
Relay base that can be fitted with 2 or 3 PDT relays.

Range of accessories includes:
- Plug-in input and interference suppression module
- Plug-in timer module
- Relay retaining bracket with ejector function and holder for marking material
- Comprehensive range of marking material
- Test plug
- FBS 2-6 plug-in bridges for the input side (A2)

Notes:
Type of insulating housing:
Polyamide PA non-reinforced, color: gray.
For further marking systems and mounting material, see Catalog 5.
Relay modules

RIFLINE complete

Technical data

- 250 V AC
  - max. 12 A (Depends on application/assembly)
- Ambient temperature (operation)
  - -40°C ... 85°C (Depends on application/assembly)
- Connection data
  - solid / stranded / AWG 0.14 ... 1.5 mm² / 26 - 16

Ordering data

Type | Order No. | Pcs. / Pkt.
--- | --- | ---
RIF-3-BPT/3X21 | 2900938 | 10

Accessories

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBS 2-6</td>
<td>3030336</td>
<td>50</td>
</tr>
<tr>
<td>FBS 2-6 BU</td>
<td>3036932</td>
<td>50</td>
</tr>
<tr>
<td>FBS 2-6 GY</td>
<td>3032237</td>
<td>50</td>
</tr>
<tr>
<td>CLIPFIX 35</td>
<td>3022218</td>
<td>50</td>
</tr>
<tr>
<td>MPS-MT</td>
<td>0201744</td>
<td>10</td>
</tr>
<tr>
<td>MPS-IH RD</td>
<td>0201676</td>
<td>10</td>
</tr>
<tr>
<td>MPS-IH WH</td>
<td>0201663</td>
<td>10</td>
</tr>
<tr>
<td>MPS-IH BU</td>
<td>0201689</td>
<td>10</td>
</tr>
<tr>
<td>MPS-IH YE</td>
<td>0201692</td>
<td>10</td>
</tr>
<tr>
<td>MPS-IH GN</td>
<td>0201702</td>
<td>10</td>
</tr>
<tr>
<td>MPS-IH GY</td>
<td>0201728</td>
<td>10</td>
</tr>
<tr>
<td>MPS-IH BK</td>
<td>0201731</td>
<td>10</td>
</tr>
<tr>
<td>ZB 5 UNBDRUCKT</td>
<td>1050004</td>
<td>10</td>
</tr>
<tr>
<td>ZB 15 UNBDRUCKT</td>
<td>0811972</td>
<td>10</td>
</tr>
<tr>
<td>STP 5-2</td>
<td>0800987</td>
<td>100</td>
</tr>
</tbody>
</table>
Plug-in octal relays with 2 or 3 PDT contacts, suitable for RIF-3 and PR3 relay bases.

The advantages:
- Detectable manual operation
- Mechanical switch position indicator
- Integrated status LED
- DC types with integrated freewheeling diode

Plug-in octal relays, with power contacts

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-OR2/LDP-24DC/2X21</td>
<td>2903689</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR2/L-24AC/2X21</td>
<td>2903690</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR2/L-120AC/2X21</td>
<td>2903691</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR2/L-230AC/2X21</td>
<td>2903692</td>
<td>10</td>
</tr>
</tbody>
</table>

Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to Uₙ)</td>
<td>refer to the diagram</td>
</tr>
<tr>
<td>Typ. input current at Uₙ (mA)</td>
<td>60 108 23 13</td>
</tr>
<tr>
<td>Typ. response time at Uₙ (ms)</td>
<td>5 - 15 5 - 15 5 - 15 5 - 15</td>
</tr>
<tr>
<td>Typ. release time at Uₙ (ms)</td>
<td>5 - 20 5 - 20 5 - 20 5 - 20</td>
</tr>
</tbody>
</table>

Output data

<table>
<thead>
<tr>
<th>Contact type</th>
<th>Single contact, 2-PDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact material</td>
<td>AgNi</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>250 V AC/DC</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>10 V (At 24 mA)</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>10 A</td>
</tr>
<tr>
<td>Max. inrush-current, AC</td>
<td>30 A (20 ms, N/O contact)</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>10 mA (at 24 V)</td>
</tr>
</tbody>
</table>

General data

<table>
<thead>
<tr>
<th>Test voltage (winding / contact)</th>
<th>2.5 kVₚₒₛ (50 Hz, 1 min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature (operation), AC</td>
<td>-40°C ... 55°C</td>
</tr>
<tr>
<td>Ambient temperature (operation), DC</td>
<td>-40°C ... 70°C</td>
</tr>
<tr>
<td>Nominal operating mode</td>
<td>100% operating factor</td>
</tr>
<tr>
<td>Mechanical service life, AC</td>
<td>Approx. 2 x 10⁷ cycles</td>
</tr>
<tr>
<td>Mechanical service life, DC</td>
<td>Approx. 2 x 10⁷ cycles</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>IEC 60664</td>
</tr>
<tr>
<td>Mounting position/mounting</td>
<td>Any</td>
</tr>
<tr>
<td>Dimensions</td>
<td>35 mm / 54.4 mm / 35 mm</td>
</tr>
</tbody>
</table>
REL-OR2... (2 PDTs)

Operating voltage range

Interrupting rating

Electrical service life

Service life reduction factor

REL-OR3... (3 PDTs)

Operating voltage range

Interrupting rating

Electrical service life

Service life reduction factor
Modular RIF-4 relay base

Relay base that can be fitted with 2 or 3 PDT relays or 3 N/O relays.
Range of accessories includes:
- Plug-in input and interference suppression module
- Plug-in timer module
- Relay retaining bracket with ejector function and holder for marking material
- Comprehensive range of marking material
- Test plug
- FBS 2-6 plug-in bridges for the input side (A2)

<table>
<thead>
<tr>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of insulating housing: Polyamide PA non-reinforced, color: gray.</td>
</tr>
<tr>
<td>For further marking systems and mounting material, see Catalog 5.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage $U_{N}$</td>
</tr>
<tr>
<td>Nominal current at $U_{N}$ max. 16 A (Depends on application/assembly)</td>
</tr>
<tr>
<td>General data</td>
</tr>
<tr>
<td>Ambient temperature (operation) -40°C ... 85°C (Depends on application/assembly)</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
</tr>
<tr>
<td>Input side 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16</td>
</tr>
<tr>
<td>Output side 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14</td>
</tr>
<tr>
<td>Dimensions</td>
</tr>
<tr>
<td>Width 43 mm</td>
</tr>
<tr>
<td>Depth with retaining bracket 90 mm</td>
</tr>
<tr>
<td>Height 107 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ordering data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
</tr>
<tr>
<td>RIF-4 relay base, plug-in option for input/interference suppression module, safe isolation I/O with push-in connection</td>
</tr>
<tr>
<td>Relay retaining bracket, with holder for marking material, suitable for RIF-4 relay base</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in bridge</td>
</tr>
<tr>
<td>2-pos. red</td>
</tr>
<tr>
<td>2-pos. blue</td>
</tr>
<tr>
<td>2-pos. gray</td>
</tr>
<tr>
<td>End clamp, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8/27, KLM...</td>
</tr>
<tr>
<td>Test plug, consisting of:</td>
</tr>
<tr>
<td>Metal part for 3.5 mm Ø socket hole and</td>
</tr>
<tr>
<td>Insulating sleeve, for MPS metal part</td>
</tr>
<tr>
<td>red</td>
</tr>
<tr>
<td>white</td>
</tr>
<tr>
<td>blue</td>
</tr>
<tr>
<td>yellow</td>
</tr>
<tr>
<td>green</td>
</tr>
<tr>
<td>gray</td>
</tr>
<tr>
<td>black</td>
</tr>
<tr>
<td>Zack marker strip, unprinted</td>
</tr>
<tr>
<td>10-section</td>
</tr>
<tr>
<td>6-section</td>
</tr>
<tr>
<td>Double marker carrier for ZB 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS-MT</td>
</tr>
<tr>
<td>0201744 10</td>
</tr>
<tr>
<td>MPS-IH RD</td>
</tr>
<tr>
<td>0201676 10</td>
</tr>
<tr>
<td>MPS-IH WH</td>
</tr>
<tr>
<td>0201663 10</td>
</tr>
<tr>
<td>MPS-IH BU</td>
</tr>
<tr>
<td>0201689 10</td>
</tr>
<tr>
<td>MPS-IH YE</td>
</tr>
<tr>
<td>0201692 10</td>
</tr>
<tr>
<td>MPS-IH GN</td>
</tr>
<tr>
<td>0201702 10</td>
</tr>
<tr>
<td>MPS-IH GY</td>
</tr>
<tr>
<td>0201728 10</td>
</tr>
<tr>
<td>MPS-IH BK</td>
</tr>
<tr>
<td>0201731 10</td>
</tr>
<tr>
<td>ZB 5 :UNBEDRUCKT</td>
</tr>
<tr>
<td>1050004 10</td>
</tr>
<tr>
<td>ZB 15:UNBEDRUCKT</td>
</tr>
<tr>
<td>0811972 10</td>
</tr>
<tr>
<td>STP 5-2</td>
</tr>
<tr>
<td>0809967 100</td>
</tr>
</tbody>
</table>
Technical data

- max. 16 A (Depends on application/assembly)
- Ambient temperature (operation) -40°C ... 85°C (Depends on application/assembly)
- Input side 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16 -
- Output side 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14 -

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-RH-4</td>
<td>2900956</td>
<td>10</td>
</tr>
</tbody>
</table>

Accessories
Plug-in high-power relays

Plug-in high-power relays with 2 or 3 PDT contacts for the RIF-4 relay base.

The advantages:

– Use in miniature contactor applications
– Switching current of up to 16 A
– Up to 440 V AC switching voltage

**Technical data**

**Input data**

| Permissible range (with reference to $U_n$) | (mA) | 56 | 116 | 23 | 12 |
| Typ. input current at $U_n$ | (mA) | 20 |
| Typ. response time at $U_n$ | (ms) | 5 - 25 |
| Typ. release time at $U_n$ | (ms) | 15 |

**Output data**

- **Contact type**: Single contact, 2-PDT
- **Contact material**: AgNi
- **Min. switching voltage**: 10 V (At 24 mA)
- **Max. inrush current, AC**: 50 A (20 ms, N/O contact)
- **Max. inrush current, DC**: 50 A (20 ms, N/O contact)
- **Min. switching current**: 10 mA (at 24 V)

**Motor load according to UL 508**

- **1/3 HP, 120 V AC (single-phase AC motor)**
- **1/2 HP, 240 V AC (single-phase AC motor)**
- **1/2 HP, 240 V AC (three-phase induction motor)**

**General data**

- **Test voltage (winding / contact)**: 2.5 kVrms (50 Hz, 1 min.)
- **Ambient temperature (operation), AC**: -40°C ... 55°C
- **Ambient temperature (operation), DC**: -40°C ... 70°C
- **Nominal operating mode**: 100% operating factor
- **Mechanical service life, AC**: Approx. 10^6 cycles
- **Mechanical service life, DC**: Approx. 10^6 cycles
- **Standards/regulations**: IEC 60664

**Mounting position/mounting**

Any

**Dimensions**

W / H / D: 38.6 mm / 45.5 mm / 36.1 mm

**Ordering data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_n$</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in high-power relays, 2 PDTs with power contacts</td>
<td></td>
<td>REL-PR2-24D/2X21</td>
<td>2903698</td>
<td>1</td>
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<tr>
<td></td>
<td></td>
<td>REL-PR2-24A/2X21</td>
<td>2903699</td>
<td>1</td>
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<tr>
<td></td>
<td></td>
<td>REL-PR2-120AC/2X21</td>
<td>2903700</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REL-PR2-230AC/2X21</td>
<td>2903701</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_n$</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in high-power relays, 3 PDTs with power contacts</td>
<td></td>
<td>REL-PR3-24D/3X21</td>
<td>2903702</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REL-PR3-24A/3X21</td>
<td>2903703</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REL-PR3-120AC/3X21</td>
<td>2903704</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REL-PR3-230AC/3X21</td>
<td>2903705</td>
<td>1</td>
</tr>
</tbody>
</table>

**Relay modules**

**RIFLINE complete**

**Plug-in high-power relays**

PHOENIX CONTACT
300 - Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
**REL-PR2... (2 PDTs)**

**Operating voltage range**

**Interrupting rating**

**Electrical service life**

- Maximum continuous voltage at limiting continuous current = 16 A
- Minimum operate voltage
  - For pre-excitation with UN and limiting continuous current = 16 A

**Service life reduction factor**

**REL-PR3... (3 PDTs)**

**Operating voltage range**

**Interrupting rating**

**Electrical service life**

- DC coils
- AC coils

**Service life reduction factor**

For additional information, visit www.phoenixcontact.net/products
Plug-in high-power relays with 3 N/O contacts suitable for the RIF-4 relay base.

The advantages:
- Use in miniature contactor applications
- Switching current of up to 16 A
- Up to 440 V AC switching voltage
- Full shutdown by means of ≥ 3 mm contact opening

### Technical data

#### Input data

<table>
<thead>
<tr>
<th>Permissible range (with reference to $U_{in}$)</th>
<th>$I_{in}$ [mA]</th>
<th>$t_{r}$ [ms]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typ. input current at $U_{in}$</td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td>Typ. response time at $U_{in}$</td>
<td>116</td>
<td>5 - 25</td>
</tr>
<tr>
<td>Typ. release time at $U_{in}$ (depending on phase relation)</td>
<td>23</td>
<td>5 - 25</td>
</tr>
<tr>
<td>Typ. release time at $U_{in}$ (depending on phase relation)</td>
<td>12</td>
<td>5 - 25</td>
</tr>
</tbody>
</table>

#### Output data

- Contact type: Single contact, 3 N/O contacts
- Contact material: AgNi
- Max. switching voltage: 440 V AC / 250 V DC
- Min. switching voltage: 10 V (at 24 mA)
- Limiting continuous current: 16 A
- Max. inrush current, AC: 50 A (20 ms, N/O contact)
- Max. inrush current, DC: 50 A (20 ms, N/O contact)
- Min. switching current: 10 mA (at 24 V)
- Max. interrupting rating, ohmic load: 250 V AC 4000 VA
- Motor load according to UL 508:
  - 1/3 HP, 120 V AC (single-phase AC motor)
  - 1/2 HP, 240 V AC (single-phase AC motor)
  - 1/2 HP, 240 V AC (three-phase induction motor)

#### General data

- Test voltage (winding/contract): 2.5 kVrms (50 Hz, 1 min.)
- Ambient temperature (operation), AC: -40°C ... 55°C
- Ambient temperature (operation), DC: -40°C ... 70°C
- Nominal operating mode: 100% operating factor
- Mechanical service life, AC: Approx. 10⁷ cycles
- Mechanical service life, DC: Approx. 10⁷ cycles
- Standards/regulations: IEC 60664
- Mounting position/mounting: Any
- Dimensions: 38.6 mm / 45.5 mm / 36.1 mm

#### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-PR3-24DC/3X1</td>
<td>2903706</td>
<td>1</td>
</tr>
<tr>
<td>REL-PR3-24AC/3X1</td>
<td>2903707</td>
<td>1</td>
</tr>
<tr>
<td>REL-PR3-120AC/3X1</td>
<td>2903708</td>
<td>1</td>
</tr>
<tr>
<td>REL-PR3-230AC/3X1</td>
<td>2903709</td>
<td>1</td>
</tr>
</tbody>
</table>
REL-PR2... (3 N/O contacts)

Operating voltage range

Interrupting rating

Electrical service life

Service life reduction factor
Relay modules

RIFLINE complete

Input modules/interference suppression modules for RIF-1, RIF-2, RIF-3, and RIF-4

Plug-in input modules/interference suppression modules for optional fitting of RIF-1 to RIF-4 relay bases.

The advantages:
- Attenuation of reverse voltage induced in coil
- Mechanical coding to protect against incorrect connection

---

## Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plug-in module</strong>, with LED status indicator and freewheeling diode to effectively limit the coil induction voltage, polarity: A1+, A2-, input voltage:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 12-24 V DC ±20%</td>
<td>RIF-LDP-12-24 DC</td>
<td>2900939</td>
<td>10</td>
</tr>
<tr>
<td>- 48-60 V DC ±20%</td>
<td>RIF-LDP-48-60 DC</td>
<td>2900940</td>
<td>10</td>
</tr>
<tr>
<td>- 110 V DC ±20%</td>
<td>RIF-LDP-110 DC</td>
<td>2900941</td>
<td>10</td>
</tr>
</tbody>
</table>

| **Plug-in module**, with LED status indicator and varistor to limit the coil induction voltage and/or external interference peaks, input voltage: | | | |
| - 12-24 V AC/DC ±20% (30-V-varistor) | RIF-LV-12-24 UC | 2900942 | 10 |
| - 48-60 V AC/DC ±20% (75-V-varistor) | RIF-LV-48-60 UC | 2900943 | 10 |
| - 120-230 V AC/110 V DC ±20% (275-V-varistor) | RIF-LV-120-230 AC/110 DC | 2900944 | 10 |

| **Plug-in module**, with varistor to limit the coil induction voltage and/or external interference peaks, input voltage: | | | |
| - 12-24 V AC/DC ±20% (30-V-varistor) | RIF-V-12-24 UC | 2900945 | 10 |
| - 48-60 V AC/DC ±20% (75-V-varistor) | RIF-V-48-60 UC | 2900947 | 10 |
| - 120-230 V AC/110 V DC ±20% (275-V-varistor) | RIF-V-120-230 UC | 2900948 | 10 |

| **Plug-in module**, with RC element to limit the coil induction voltage and/or external interference peaks, input voltage: | | | |
| - 12-24 V AC/DC ±20% (220 nF/100 Ω) | RIF-RC-12-24 UC | 2900949 | 10 |
| - 48-60 V AC/DC ±20% (220 nF/220 Ω) | RIF-RC-48-60 UC | 2900950 | 10 |
| - 120-230 V AC/110 DC ±20% (100 nF/470 Ω) | RIF-RC-120-230 UC | 2900951 | 10 |
Plug-in timer module for RIF-1, RIF-2, RIF-3, and RIF-4

The multifunctional plug-in timer module transforms the relay module into a timer relay. The RIF-1 to RIF-4 bases can be fitted with this module. Using DIP switches, you can choose from three time ranges and select four time functions. Fine adjustments to the time are made using a potentiometer. Relays can be operated with an input voltage of 24 V AC/DC.

Functions:
- Switch-on delay
- Single shot leading edge
- Flasher/pulse generator

Time ranges:
- 0.5 s - 10 s
- 5 s - 100 s
- 0.5 min - 10 min
- 5 min - 100 min

For additional information, visit www.phoenixcontact.net/products
Technical data

| Input data | Permissible range (with reference to \( U_n \)) | [mA] | Typ. input current at \( U_i \) | [mA] | Typ. response time at \( U_r \) | [ms] | Typ. release time at \( U_r \) | [ms] | Input protection:
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to the diagram</td>
<td>16</td>
<td>9</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Yellow LED, Damping diode

Output data

Contact type: Single contact, 1-PDT
Contact material: AgSnO, hard gold-plated
Max. switching voltage: 250 V AC/DC, 30 V AC / 36 V DC
Min. switching voltage: 5 V (at 100 mA), 100 mV (at 10 mA)
Limiting continuous current: 6 A, 50 mA
Min. switching current: 10 mA (at 12 V), 1 mA

General data

Test voltage (winding / contact): 4 kVrms (50 Hz, 1 min.)
Ambient temperature (operation): -40°C ... 60°C
Nominal operating mode: 100% operating factor
Mechanical service life: Approx. 2 x 10⁷ cycles
Standards/regulations: DIN EN 50178, IEC 62103
Pollution degree/surge voltage category: 2 / III
Mounting position/mounting: Any / In rows with zero spacing
Connection data solid / stranded / AWG: 0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16
Dimensions: 6.2 mm / 78 mm / 93 mm

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage ( U_n )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupling relay modules with power contact relay</td>
<td>12 V DC, 24 V DC</td>
</tr>
<tr>
<td>Coupling relay modules with power contact relay and gold contacts</td>
<td>12 V DC, 24 V DC</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-0-RPT-12DC/21</td>
<td>2903371</td>
<td>10</td>
</tr>
<tr>
<td>RIF-0-RPT-24DC/21</td>
<td>2903370</td>
<td>10</td>
</tr>
<tr>
<td>RIF-0-RPT-12DC/21AU</td>
<td>2903369</td>
<td>10</td>
</tr>
<tr>
<td>RIF-0-RPT-24DC/21AU</td>
<td>2903368</td>
<td>10</td>
</tr>
</tbody>
</table>

Fully mounted RIF-0 relay modules

Fully mounted RIF-0 relay modules, consisting of:
- Relay base
- 1 N/O contact or 1 PDT relay
- Relay ejector lever on the housing

The advantages:
- Status LED integrated in the relay base
- Operational reliability thanks to sealed relay
- Safe isolation between coil and contact side
- Professional bridging of adjacent modules saves wiring time

For FBS 2-6 plug-in bridges for the input and output side, see page 318.
RIF-0-RPT.../21... (1 PDT)

**Technical data**

- **Ambient temperature [°C]**: 0 to 80°C
- **Min. switching voltage**: 5 V (at 100 mA), 100 mV (at 10 mA)
- **Max. switching voltage**: 250 V AC/DC, 30 V AC / 36 V DC
- **Contact material**: AgSnO, hard gold-plated
- **Min. switching current**: 10 mA (at 12 V)
- **Max. switching current**: 50 mA
- **Contact type**: Single contact, 1-PDT
- **Input protection**: Yellow LED, Damping diode
- **Mounting position/mounting**: Any / In rows with zero spacing
- **Standards/regulations**: DIN EN 50178, IEC 62103
- **Dimensions**: 6.2 mm / 78 mm / 93 mm
- **Connection data**: solid / stranded / AWG 0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16
- **Switching rating**: 50 Hz, 1 min. 4 kVrms
- **Cycles**: Approx. 2 x 10⁷ cycles

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-0-RPT-12DC/1</td>
<td>2903362</td>
<td>10</td>
</tr>
<tr>
<td>RIF-0-RPT-24DC/1</td>
<td>2903361</td>
<td>10</td>
</tr>
<tr>
<td>RIF-0-RPT-12DC/1AU</td>
<td>2903360</td>
<td>10</td>
</tr>
<tr>
<td>RIF-0-RPT-24DC/1AU</td>
<td>2903359</td>
<td>10</td>
</tr>
</tbody>
</table>

**RIF-0-RPT.../1... (1 N/O contact)**

**Technical data**

- **Ambient temperature [°C]**: -40°C ... 60°C
- **Min. switching voltage**: 5 V (at 100 mA), 100 mV (at 10 mA)
- **Max. switching voltage**: 250 V AC/DC, 30 V AC / 36 V DC
- **Contact material**: AgSnO, hard gold-plated
- **Min. switching current**: 10 mA (at 12 V)
- **Max. switching current**: 50 mA
- **Contact type**: Single contact, 1 N/O contact
- **Input protection**: Yellow LED, Damping diode
- **Mounting position/mounting**: Any / In rows with zero spacing
- **Standards/regulations**: DIN EN 50178, IEC 62103
- **Dimensions**: 6.2 mm / 78 mm / 93 mm
- **Connection data**: solid / stranded / AWG 0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16
- **Switching rating**: 50 Hz, 1 min. 4 kVrms
- **Cycles**: Approx. 2 x 10⁷ cycles

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-0-RPT-12DC/1</td>
<td>2903362</td>
<td>10</td>
</tr>
<tr>
<td>RIF-0-RPT-24DC/1</td>
<td>2903361</td>
<td>10</td>
</tr>
<tr>
<td>RIF-0-RPT-12DC/1AU</td>
<td>2903360</td>
<td>10</td>
</tr>
<tr>
<td>RIF-0-RPT-24DC/1AU</td>
<td>2903359</td>
<td>10</td>
</tr>
</tbody>
</table>
Fully mounted RIF-1 relay modules

Fully mounted RIF-1 relay modules, consisting of:
- 1 or 2 PDT relays
- Relay retaining bracket
- Input module/interference suppr. module

The advantages:
- Logical contact arrangement thanks to 1/3-level relay base
- Operational reliability thanks to sealed relay
- Safe isolation between coil and contact side
- Professional bridging of adjacent modules saves wiring time

- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.
- For FBS 2-8 plug-in bridges for the output side (11/21), see page 318.

### Technical data

#### Input data

<table>
<thead>
<tr>
<th>Permissible range (with reference to $U_N$)</th>
<th>[mA]</th>
<th>Typ. input current at $U_N$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typ. response time at $U_N$</th>
<th>[ms]</th>
<th>3 - 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>3 - 12</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>3 - 12</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typ. release time at $U_N$</th>
<th>[ms]</th>
<th>3 - 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>3 - 20</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>3 - 20</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input circuit AC</th>
<th>Yellow LED, Varistor</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Input circuit DC</th>
<th>Yellow LED, Damping diode, Polarity protection diode</th>
</tr>
</thead>
</table>

#### Output data

<table>
<thead>
<tr>
<th>Contact type</th>
<th>Single contact, 1-PDT</th>
<th>Single contact, 1-PDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact material</td>
<td>AgNi</td>
<td>AgNi, hard gold-plated</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>250 V AC/DC</td>
<td>30 V AC / 36 V DC</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>100 mA (at 10 mA)</td>
<td>50 mA (at 10 mA)</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>50 mA (at 10 mA)</td>
<td>50 mA (at 10 mA)</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>10 mA (at 12 V)</td>
<td>1 mA (at 24 V)</td>
</tr>
</tbody>
</table>

#### General data

<table>
<thead>
<tr>
<th>Test voltage (winding / contact)</th>
<th>4 kVrms (50 Hz, 1 min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature (operation), AC</td>
<td>-40°C ... 70°C</td>
</tr>
<tr>
<td>Ambient temperature (operation), DC</td>
<td>-40°C ... 50°C</td>
</tr>
<tr>
<td>Nominal operating mode</td>
<td>100% operating factor</td>
</tr>
<tr>
<td>Mechanical service life, AC</td>
<td>Approx. 10⁷ cycles</td>
</tr>
<tr>
<td>Mechanical service life, DC</td>
<td>Approx. 3 x 10⁷ cycles</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>DIN EN 50178, IEC 62103</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category</td>
<td>2 / III</td>
</tr>
<tr>
<td>Mounting position/mounting</td>
<td>Any / In rows with zero spacing</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16</td>
</tr>
<tr>
<td>Dimensions</td>
<td>16 mm / 75 mm / 93 mm</td>
</tr>
</tbody>
</table>

#### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-1-RPT-LDP-24DC/1X1AU</td>
<td>2903338</td>
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<tr>
<td>RIF-1-RPT-LV-24AC/1X21AU</td>
<td>2903337</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-120AC/1X21AU</td>
<td>2903336</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-230AC/1X21AU</td>
<td>2903335</td>
<td>10</td>
</tr>
</tbody>
</table>
RIF-1-RPT.../1X21... (1 PDT)

Technical data

- AgNi
- AgNi, hard gold-plated
- 250 V AC/DC: 30 V AC / 36 V DC
- 5 V (at 10 mA)
- 8 A (refer to the diagram)
- 12 A (20 ms, N/O contact)
- 25 A (20 ms, N/O contact)
- 10 mA (at 24 V)
- 4 kVrms (50 Hz, 1 min.)
- -40°C ... 70°C
- -40°C ... 50°C
- 100% operating factor
- Approx. 10^7 cycles
- Approx. 3 x 10^8 cycles
- DIN EN 50178, IEC 62103
- 2 / III
- Any / in rows with zero spacing
- 0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16
- 10 mm / 75 mm / 93 mm

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-1-RPT-LD-24DC/2X21</td>
<td>2903334</td>
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</tr>
<tr>
<td>RIF-1-RPT-LV-24AC/2X21</td>
<td>2903333</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-120AC/2X21</td>
<td>2903332</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-230AC/2X21</td>
<td>2903331</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LD-24DC/2X21AU</td>
<td>2903330</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-24AC/2X21AU</td>
<td>2903329</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-120AC/2X21AU</td>
<td>2903328</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-230AC/2X21AU</td>
<td>2903327</td>
<td>10</td>
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</tbody>
</table>

RIF-1-RPT.../2X21... (2 PDTs)

Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-1-RPT-LD-24DC/2X21</td>
<td>2903334</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-24AC/2X21</td>
<td>2903333</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-120AC/2X21</td>
<td>2903332</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-230AC/2X21</td>
<td>2903331</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LD-24DC/2X21AU</td>
<td>2903330</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-24AC/2X21AU</td>
<td>2903329</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-120AC/2X21AU</td>
<td>2903328</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-230AC/2X21AU</td>
<td>2903327</td>
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Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-1-RPT-LD-24DC/2X21</td>
<td>2903334</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-24AC/2X21</td>
<td>2903333</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-120AC/2X21</td>
<td>2903332</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-230AC/2X21</td>
<td>2903331</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LD-24DC/2X21AU</td>
<td>2903330</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-24AC/2X21AU</td>
<td>2903329</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-120AC/2X21AU</td>
<td>2903328</td>
<td>10</td>
</tr>
<tr>
<td>RIF-1-RPT-LV-230AC/2X21AU</td>
<td>2903327</td>
<td>10</td>
</tr>
</tbody>
</table>
Fully mounted RIF-2 relay modules

Fully mounted RIF-2 relay modules, consisting of:
- 1 or 2 PDT relays
- Relay retaining bracket
- Input module/interference suppr. module (AC types only)

The advantages:
- Relay with lockable manual operation and status LED
- With DC types, freewheeling diode is integrated into relay
- Mechanical switch position indicator
- Logical contact arrangement thanks to 1/3-level relay base
- Professional bridging of adjacent modules saves wiring time
- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.

Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to $U_{\text{n}}$)</td>
<td>refer to the diagram</td>
<td>41</td>
<td>70</td>
<td>13</td>
</tr>
<tr>
<td>Typ. input current at $U_{\text{n}}$ [mA]</td>
<td>[mA]</td>
<td>41</td>
<td>70</td>
<td>13</td>
</tr>
<tr>
<td>Typ. response time at $U_{\text{n}}$ [ms]</td>
<td>[ms]</td>
<td>13</td>
<td>5 - 15</td>
<td>5 - 15</td>
</tr>
<tr>
<td>Typ. release time at $U_{\text{n}}$ [ms]</td>
<td>[ms]</td>
<td>14</td>
<td>5 - 20</td>
<td>5 - 20</td>
</tr>
<tr>
<td>Input circuit AC</td>
<td>Yellow LED, Varistor</td>
<td>Yellow LED, Damping diode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input circuit DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Output data

<table>
<thead>
<tr>
<th>Contact type</th>
<th>Input module/interference suppr. module (AC types only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact material</td>
<td>AgNi</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>250 V AC/DC</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>5 V (at 24 mA)</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>(refer to the diagram)</td>
</tr>
<tr>
<td>Max. inrush current, AC</td>
<td>30 A (20 ms, N/O contact)</td>
</tr>
<tr>
<td>Max. inrush current, DC</td>
<td>30 A (20 ms, N/O contact)</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>5 mA (at 24 V)</td>
</tr>
</tbody>
</table>

General data

| Test voltage (winding / contact) | 2.5 kV$_{\text{rms}}$ (50 Hz, 1 min.) |
| Ambient temperature (operation), AC | -40°C...50°C |
| Ambient temperature (operation), DC | -40°C...60°C |
| Nominal operating mode | 100% operating factor |
| Mechanical service life, AC | Approx. 2 x 10$^7$ cycles |
| Mechanical service life, DC | Approx. 2 x 10$^7$ cycles |
| Standards/regulations | DIN EN 50178, IEC 62103 |
| Pollution degree/surge voltage category | 2 / III |
| Mounting position/mounting | Any / In rows with zero spacing |
| Connection data solid / stranded / AWG | 0.14 / 1.5 mm$^2$ / 0.14 - 1.5 mm$^2$ / 26 - 16 |
| Dimensions | 31 mm / 75 mm / 93 mm |

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_{\text{n}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-assembled coupling relay modules with miniature power contact relay</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>24 V DC</td>
</tr>
<tr>
<td>2</td>
<td>24 V AC</td>
</tr>
<tr>
<td>3</td>
<td>120 V AC</td>
</tr>
<tr>
<td>4</td>
<td>230 V AC</td>
</tr>
</tbody>
</table>

RIF-2-RPT-LDP-24DC/2X21 | 2903315 | 10 |
RIF-2-RPT-LV-24AC/2X21 | 2903313 | 10 |
RIF-2-RPT-LV-120AC/2X21 | 2903311 | 10 |
RIF-2-RPT-LV-230AC/2X21 | 2903310 | 10 |
RIF-2-RPT.../2X21 (2 PDTs)

**Operating voltage range**

![Graph showing operating voltage range]

**Interrupting rating**

![Graph showing interrupting rating]

**Contact derating**

![Graph showing contact derating]

**Electrical service life**

![Graph showing electrical service life]

---

**Technical data**

1. Single contact, 4-PDT
2. AgNi
3. 250 V AC/DC
4. 5 V (At 24 mA)

**Ambient temperature [°C]**

- DC coil (observe contact derating)
- AC coil (observe contact derating)

**Limiting continuous current per contact [A]**

- DC coil
- AC coil

**Switching capacity [kVA]**

- 250 V AC, ohmic load

---

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-2-RPT-LDP-24DC/4X21</td>
<td>2903308</td>
<td>10</td>
</tr>
<tr>
<td>RIF-2-RPT-LV-24AC/4X21</td>
<td>2903305</td>
<td>10</td>
</tr>
<tr>
<td>RIF-2-RPT-LV-120AC/4X21</td>
<td>2903305</td>
<td>10</td>
</tr>
<tr>
<td>RIF-2-RPT-LV-230AC/4X21</td>
<td>2903304</td>
<td>10</td>
</tr>
</tbody>
</table>

---

For additional information, visit [www.phoenixcontact.net/products](http://www.phoenixcontact.net/products)

---

PHOENIX CONTACT
Fully mounted RIF-3 relay modules

Fully mounted RIF-3 relay modules, consisting of:
- Relay base
- 2 or 3 PDT relays
- Relay retaining bracket
- Input module/interference suppr. module (AC types only)

The advantages:
- Relay with lockable manual operation and status LED
- With DC types, freewheeling diode is integrated into relay
- Mechanical switch position indicator
- Logical contact arrangement thanks to 1/3-level relay base
- Professional bridging of adjacent modules saves wiring time

- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.

Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>①</th>
<th>②</th>
<th>③</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to $U_n$)</td>
<td>refer to the diagram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typ. input current at $U_n$ [mA]</td>
<td>60</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>Typ. response time at $U_n$ [ms]</td>
<td>18</td>
<td>5 - 15</td>
<td>5 - 15</td>
</tr>
<tr>
<td>Typ. release time at $U_n$ [ms]</td>
<td>20</td>
<td>5 - 20</td>
<td>5 - 20</td>
</tr>
<tr>
<td>Input circuit AC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input circuit DC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Output data

<table>
<thead>
<tr>
<th>Contact type</th>
<th>Single contact, 2-PDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact material</td>
<td>AgNi</td>
</tr>
<tr>
<td>Max. switching voltage AC/DC</td>
<td>250 V</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>10 V (At 24 mA)</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>(refer to the diagram)</td>
</tr>
<tr>
<td>Max. inrush current, AC</td>
<td>30 A (20 ms, N/O contact)</td>
</tr>
<tr>
<td>Max. inrush current, DC</td>
<td>30 A (20 ms, N/O contact)</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>10 mA (at 24 V)</td>
</tr>
</tbody>
</table>

General data

<table>
<thead>
<tr>
<th>Test voltage (winding / contact)</th>
<th>2.5 $V_{rms}$ (50 Hz, 1 min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature (operation), AC</td>
<td>-40°C...50°C</td>
</tr>
<tr>
<td>Ambient temperature (operation), DC</td>
<td>-40°C...60°C</td>
</tr>
<tr>
<td>Nominal operating mode</td>
<td>100% operating factor</td>
</tr>
<tr>
<td>Mechanical service life, AC</td>
<td>Approx. $2 \times 10^7$ cycles</td>
</tr>
<tr>
<td>Mechanical service life, DC</td>
<td>Approx. $2 \times 10^7$ cycles</td>
</tr>
<tr>
<td>Standards/ regulations</td>
<td>DIN EN 50178, IEC 62103</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category</td>
<td>2 / III</td>
</tr>
<tr>
<td>Mounting position/mounting</td>
<td>Any / In rows with zero spacing</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 - 1.5 mm$^2$ / 0.14 - 1.5 mm$^2$ / 26 - 16</td>
</tr>
<tr>
<td>Dimensions</td>
<td>40 mm / 90 mm / 100 mm</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-assembled coupling relay modules with miniature power contact relay</td>
<td></td>
</tr>
<tr>
<td>①</td>
<td>24 V DC</td>
</tr>
<tr>
<td>②</td>
<td>120 V AC</td>
</tr>
<tr>
<td>③</td>
<td>230 V AC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-3-RPT-LDP-24DC/2X21</td>
<td>2903297</td>
<td>5</td>
</tr>
<tr>
<td>RIF-3-RPT-LV-120AC/2X21</td>
<td>2903296</td>
<td>5</td>
</tr>
<tr>
<td>RIF-3-RPT-LV-230AC/2X21</td>
<td>2903295</td>
<td>5</td>
</tr>
</tbody>
</table>
RIF-3-RPT.../2X21 (2 PDTs)

Operating voltage range

Interrupting rating

Contact derating

Electrical service life

RIF-3-RPT.../3X21 (3 PDTs)

Operating voltage range

Interrupting rating

Contact derating

Electrical service life

Technological data

Technical data

- Single contact, three PDTs
- AgNi
- 250 V AC/DC
- 10 V (at 24 mA)
- (refer to the diagram)
- 30 A (20 ms, N/O contact)
- 30 A (20 ms, N/O contact)
- 10 mA (at 24 V)
- 2.5 kVrms (50 Hz, 1 min.)
- -40°C ... 60°C
- -40°C ... 60°C
- 100% operating factor
- Approx. 2 x 10^7 cycles
- Approx. 2 x 10^7 cycles
- DIN EN 50178, IEC 62103
- 2 / III
- Any / in rows with zero spacing
- 0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16
- 40 mm / 90 mm / 100 mm

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-3-RPT-LDP-24DC/3X21</td>
<td>2903294</td>
<td>5</td>
</tr>
<tr>
<td>RIF-3-RPT-LV-120AC/3X21</td>
<td>2903293</td>
<td>5</td>
</tr>
<tr>
<td>RIF-3-RPT-LV-230AC/3X21</td>
<td>2903292</td>
<td>5</td>
</tr>
</tbody>
</table>

For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT | 313

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
Fully mounted RIF-4 relay modules

Fully mounted RIF-4 relay modules, consisting of:
- Relay base
- 2 or 3 PDT relays
- Relay retaining bracket
- Input module/interference suppr. module

The advantages:
- Logical contact arrangement thanks to 1/3-level relay base
- Professional bridging of adjacent modules saves wiring time
- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.

Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>Permissible range (with reference to $U_n$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[mA]</td>
</tr>
</tbody>
</table>
| Typ. input current at $U_n$ | 56
| Typ. response time at $U_n$ | 20
| Typ. release time at $U_n$ | 20

<table>
<thead>
<tr>
<th>Input circuit AC/DC</th>
<th>Yellow LED, Varistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input circuit AC/DC</td>
<td>Yellow LED, Damping diode, Polarity protection diode</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output data</th>
<th>Contact type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single contact, 2-PDT</td>
</tr>
<tr>
<td></td>
<td>AgNi</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>440 V AC / 250 V DC</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>10 V (at 24 mA)</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>(refer to the diagram)</td>
</tr>
<tr>
<td>Max. inrush current, AC</td>
<td>50 A (20 ms, N/O contact)</td>
</tr>
<tr>
<td>Max. inrush current, DC</td>
<td>50 A (20 ms, N/O contact)</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>10 mA (at 24 V)</td>
</tr>
<tr>
<td>Max. interrupting rating, ohmic load</td>
<td>250 V AC 2500 VA</td>
</tr>
<tr>
<td>440 V AC 4000 VA</td>
<td></td>
</tr>
<tr>
<td>Motor load according to UL 508</td>
<td>1/3 HP, 120 V AC (single-phase AC motor)</td>
</tr>
<tr>
<td>1/2 HP, 240 V AC (single-phase AC motor)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General data</th>
<th>Test voltage (winding / contact)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test voltage (winding / contact)</td>
<td>2.5 kV&lt;sub&gt;min&lt;/sub&gt; (50 Hz, 1 min.)</td>
</tr>
<tr>
<td>Ambient temperature (operation), AC</td>
<td>-40 °C ... 40 °C</td>
</tr>
<tr>
<td>Ambient temperature (operation), DC</td>
<td>-40 °C ... 60 °C</td>
</tr>
<tr>
<td>Nominal operating mode</td>
<td>100% operating factor</td>
</tr>
<tr>
<td>Mechanical service life, AC</td>
<td>Approx. 10&lt;sup&gt;7&lt;/sup&gt; cycles</td>
</tr>
<tr>
<td>Mechanical service life, DC</td>
<td>Approx. 10&lt;sup&gt;7&lt;/sup&gt; cycles</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>DIN EN 50178, IEC 62103</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category</td>
<td>2 / III</td>
</tr>
<tr>
<td>Mounting position/mounting</td>
<td>Any / In rows with zero spacing</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 ... 1.5 mm&lt;sup&gt;2&lt;/sup&gt; / 0.14 ... 1.5 mm&lt;sup&gt;2&lt;/sup&gt; / 26 - 16</td>
</tr>
<tr>
<td>0.14 ... 2.5 mm&lt;sup&gt;2&lt;/sup&gt; / 0.14 ... 2.5 mm&lt;sup&gt;2&lt;/sup&gt; / 26 - 14</td>
<td></td>
</tr>
<tr>
<td>43 mm / 90 mm / 107 mm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre-assembled coupling relay modules with miniature power contact relay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage $U_n$</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>24 V DC</td>
</tr>
<tr>
<td>120 V AC</td>
</tr>
<tr>
<td>230 V AC</td>
</tr>
</tbody>
</table>
RIF-4-RPT.../2X21 (2 PDTs)

Operating voltage range

Interrupting rating

Contact derating

Electrical service life

RIF-4-RPT.../3X21 (3 PDTs)

Operating voltage range

Interrupting rating

Contact derating

Electrical service life

Technical data

Single contact, three PDTs
AgNi
440 V AC / 250 V DC
10 V (At 24 mA)
(see the diagram)
50 A (20 ms, N/O contact)
50 A (20 ms, N/O contact)
10 mA (at 24 V)
2500 VA
4000 VA
1/3 HP, 120 V AC (single-phase AC motor)
1/2 HP, 240 V AC (single-phase AC motor)
1/2 HP, 240 V AC (three-phase induction motor)
2.5 kVAR (50 Hz, 1 min.)
-40°C ... 60°C
-40°C ... 60°C
100% operating factor
Approx. 100 cycles
DIN EN 50178, IEC 62103
2 1 I

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs./Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-4-RPT-LDP-24DC/3X21</td>
<td>2903278</td>
<td>5</td>
</tr>
<tr>
<td>RIF-4-RPT-LV-120AC/3X21</td>
<td>2903277</td>
<td>5</td>
</tr>
<tr>
<td>RIF-4-RPT-LV-230AC/3X21</td>
<td>2903276</td>
<td>5</td>
</tr>
</tbody>
</table>
Fully mounted RIF-4 relay modules

Fully mounted RIF-4 relay modules, consisting of:
- Relay base
- 3 N/O relays
- Relay retaining bracket
- Input module/interference suppr. module

The advantages:
- Logical contact arrangement thanks to 1/3-level relay base
- Full shutdown by means of ≥ 3 mm contact opening
- Professional bridging of adjacent modules saves wiring time

- For FBS 2-6 plug-in bridges for the input side (A2), see page 318.

Technical data

**Input data**

- Permissible range (with reference to $U_n$) refer to the diagram
- Typ. input current at $U_n$ [mA] 70 24 14
- Typ. response time at $U_n$ [ms] 20 5 - 25 5 - 25
- Typ. release time at $U_n$ [ms] 20 5 - 20 5 - 20
- Input circuit AC
- Input circuit DC

**Output data**

- Contact type Single contact, 3 N/O contacts
- Contact material AgNi
- Max. switching voltage 440 V AC / 250 V DC
- Min. switching voltage 10 V (At 24 mA)
- Limiting continuous current (refer to the diagram)
- Max. inrush current, AC 50 A (20 ms, N/O contact)
- Max. inrush current, DC 50 A (20 ms, N/O contact)
- Min. switching current 10 mA (at 24 V)
- Max. interrupting rating, ohmic load
  - 250 V AC 2500 VA
  - 440 V AC 4000 VA
- Motor load according to UL 508
  - 1/3 HP, 120 V AC (single-phase AC motor)
  - 1/2 HP, 240 V AC (single-phase AC motor)
  - 1/2 HP, 240 V AC (three-phase induction motor)

**General data**

- Test voltage (winding / contact) 2.5 $V_{rms}$ (50 Hz, 1 min.)
- Ambient temperature (operation), AC -40°C ... 40°C
- Ambient temperature (operation), DC -40°C ... 60°C
- Nominal operating mode 100% operating factor
- Mechanical service life, AC Approx. 10^7 cycles
- Mechanical service life, DC Approx. 10^7 cycles
- Standards/regulations DIN EN 50178, IEC 62103
- Pollution degree/surge voltage category 2 / III
- Mounting position/mounting Any / In rows with zero spacing
- Connection data solid / stranded / AWG
  - Input side 0.14 ... 1.5 mm² / 0.14 ... 1.5 mm² / 26 - 16
  - Output side 0.14 ... 2.5 mm² / 0.14 ... 2.5 mm² / 26 - 14
  - 43 mm / 90 mm / 107 mm

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF-4-RPT-LDP-24DC/3X1</td>
<td>2903275</td>
<td>5</td>
</tr>
<tr>
<td>RIF-4-RPT-LV-120AC/3X1</td>
<td>2903274</td>
<td>5</td>
</tr>
<tr>
<td>RIF-4-RPT-LV-230AC/3X1</td>
<td>2903273</td>
<td>5</td>
</tr>
</tbody>
</table>
**RIF-4-RPT.../3X1 (3 N/O contacts)**

### Operating voltage range

- **Coil voltage (U)**
- **Ambient temperature (°C)**
  - DC coil (observe contact derating)
  - AC coil (observe contact derating)

### Interrupting rating

- **Switching current (A)**
- **Switching voltage (V)**
  - AC, ohmic load
  - DC, ohmic load

### Contact derating

- **Limiting continuous current per contact (A)**
- **Ambient temperature (°C)**
  - DC coil
  - AC coil

### Electrical service life

- **Switching capacity (kVA)**
- **Cycles**
  - 250 V AC, ohmic load
### RIFLINE complete accessories

#### Plug-in bridges

The plug-in bridges can be used for simple potential distribution via all relay bases.

The end clamp is used for safe isolation between adjacent modules and to visually separate the various function groups.

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-pos. red</td>
<td></td>
<td>FBS 2-6</td>
<td>3030336</td>
<td>50</td>
</tr>
<tr>
<td>2-pos. blue</td>
<td></td>
<td>FBS 2-6 BU</td>
<td>3036932</td>
<td>50</td>
</tr>
<tr>
<td>2-pos. gray</td>
<td></td>
<td>FBS 2-6 GY</td>
<td>3032237</td>
<td>50</td>
</tr>
<tr>
<td>5-pos. red</td>
<td></td>
<td>FBS 5-6</td>
<td>3030271</td>
<td>10</td>
</tr>
<tr>
<td>10-pos. red</td>
<td></td>
<td>FBS 10-6</td>
<td>3030365</td>
<td>10</td>
</tr>
<tr>
<td>20-pos. red</td>
<td></td>
<td>FBS 20-6</td>
<td>3032224</td>
<td>10</td>
</tr>
<tr>
<td>2-pos. red</td>
<td></td>
<td>FBS 2-8</td>
<td>303284</td>
<td>10</td>
</tr>
<tr>
<td>2-pos. blue</td>
<td></td>
<td>FBS 2-8 BU</td>
<td>3032567</td>
<td>10</td>
</tr>
<tr>
<td>2-pos. gray</td>
<td></td>
<td>FBS 2-8 GY</td>
<td>3032441</td>
<td>10</td>
</tr>
</tbody>
</table>

**End clamp**, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8/27, KLM...

#### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in bridge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-pos. red</td>
<td></td>
<td>FBS 2-6</td>
<td>3030336</td>
<td>50</td>
</tr>
<tr>
<td>2-pos. blue</td>
<td></td>
<td>FBS 2-6 BU</td>
<td>3036932</td>
<td>50</td>
</tr>
<tr>
<td>2-pos. gray</td>
<td></td>
<td>FBS 2-6 GY</td>
<td>3032237</td>
<td>50</td>
</tr>
<tr>
<td>5-pos. red</td>
<td></td>
<td>FBS 5-6</td>
<td>3030271</td>
<td>10</td>
</tr>
<tr>
<td>10-pos. red</td>
<td></td>
<td>FBS 10-6</td>
<td>3030365</td>
<td>10</td>
</tr>
<tr>
<td>20-pos. red</td>
<td></td>
<td>FBS 20-6</td>
<td>3032224</td>
<td>10</td>
</tr>
<tr>
<td>2-pos. red</td>
<td></td>
<td>FBS 2-8</td>
<td>303284</td>
<td>10</td>
</tr>
<tr>
<td>2-pos. blue</td>
<td></td>
<td>FBS 2-8 BU</td>
<td>3032567</td>
<td>10</td>
</tr>
<tr>
<td>2-pos. gray</td>
<td></td>
<td>FBS 2-8 GY</td>
<td>3032441</td>
<td>10</td>
</tr>
</tbody>
</table>

**CLIPFIX 35**

3022218  50

---

### RIFLINE complete accessories

#### Marking material

The ZB zack marker strip system offers numerous marking options that can be attached directly to the relay retaining brackets. In addition, further markings can be fixed to the relay base by means of double marker carriers.

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zack marker strip, unprinted</td>
<td>white</td>
<td>ZB 5: UNBEDRUCKT</td>
<td>1050004</td>
<td>10</td>
</tr>
<tr>
<td>10-section</td>
<td>white</td>
<td>ZB 6: UNBEDRUCKT</td>
<td>1051003</td>
<td>10</td>
</tr>
<tr>
<td>5-section</td>
<td>white</td>
<td>ZB 15: UNBEDRUCKT</td>
<td>0811972</td>
<td>10</td>
</tr>
<tr>
<td>Double marker carrier for ZB 5</td>
<td>gray</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Double marker carrier**

5.2 mm, 6.2 mm, and 15.2 mm wide

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zack marker strip, unprinted</td>
<td>white</td>
<td>ZB 5: UNBEDRUCKT</td>
<td>1050004</td>
<td>10</td>
</tr>
<tr>
<td>10-section</td>
<td>white</td>
<td>ZB 6: UNBEDRUCKT</td>
<td>1051003</td>
<td>10</td>
</tr>
<tr>
<td>5-section</td>
<td>white</td>
<td>ZB 15: UNBEDRUCKT</td>
<td>0811972</td>
<td>10</td>
</tr>
</tbody>
</table>

**Double marker carrier**

5.2 mm, 6.2 mm, and 15.2 mm wide

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zack marker strip, unprinted</td>
<td>white</td>
<td>ZB 5: UNBEDRUCKT</td>
<td>1050004</td>
<td>10</td>
</tr>
<tr>
<td>10-section</td>
<td>white</td>
<td>ZB 6: UNBEDRUCKT</td>
<td>1051003</td>
<td>10</td>
</tr>
<tr>
<td>5-section</td>
<td>white</td>
<td>ZB 15: UNBEDRUCKT</td>
<td>0811972</td>
<td>10</td>
</tr>
</tbody>
</table>

**Double marker carrier**

5.2 mm, 6.2 mm, and 15.2 mm wide

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zack marker strip, unprinted</td>
<td>white</td>
<td>ZB 5: UNBEDRUCKT</td>
<td>1050004</td>
<td>10</td>
</tr>
<tr>
<td>10-section</td>
<td>white</td>
<td>ZB 6: UNBEDRUCKT</td>
<td>1051003</td>
<td>10</td>
</tr>
<tr>
<td>5-section</td>
<td>white</td>
<td>ZB 15: UNBEDRUCKT</td>
<td>0811972</td>
<td>10</td>
</tr>
</tbody>
</table>

**Double marker carrier**

5.2 mm, 6.2 mm, and 15.2 mm wide

<table>
<thead>
<tr>
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<th>Color</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<td>ZB 6: UNBEDRUCKT</td>
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<td>ZB 15: UNBEDRUCKT</td>
<td>0811972</td>
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</table>

**Double marker carrier**

5.2 mm, 6.2 mm, and 15.2 mm wide

<table>
<thead>
<tr>
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<th>Color</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<td>ZB 6: UNBEDRUCKT</td>
<td>1051003</td>
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<td>5-section</td>
<td>white</td>
<td>ZB 15: UNBEDRUCKT</td>
<td>0811972</td>
<td>10</td>
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**RIFLINE complete accessories**

**Test plugs**

The two-piece test plug offers individual plug color combinations. The test plug is inserted directly in the function shaft of the push-in connection.

<table>
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<tr>
<th>Description</th>
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<th>Order No.</th>
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<tr>
<td>Test plug, consisting of:</td>
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<tr>
<td>Metal part for 2.3 mm Ø socket hole and Insulating sleeve, for MPS metal part</td>
<td>red</td>
<td>0201744</td>
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<td></td>
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<td></td>
<td>yellow</td>
<td>0201689</td>
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Pcs./Pkt.
The PLC-INTERFACE relay system is the interface between the controller and system I/O devices.

The universal design is compact and space-saving. While the narrow 6.2 mm module has one contact, the 14 mm version is available with two contacts. The modules can be equipped with either an electromechanical or a solid-state relay.

They are protected against environmental influences by RTIII (IP67). The relays also offer safe isolation according to DIN EN 50178 (VDE 0160).

PLC-INTERFACE is available with three connection technologies. Depending on the area of application, screw, spring-cage or push-in connection can be selected.

In addition to the universal types, PLC-INTERFACE is also available in numerous special versions. These include:
- Sensor and actuator modules that can accommodate all connections directly on the interface
- Modules for high inrush or continuous currents
- Railway modules, which meet specific railway requirements
- Filter modules, which filter out interference on the input side

Plug-in bridges are available for all modules for simple potential distribution. In addition, solutions from system cabling applications offer easy connection to the plant control system. VARIOFACE adapters can be used to reduce wiring effort considerably. Installation is simplified significantly thanks to the integrated input and protective circuit.

Standard marking material from CLIPLINE complete modular terminal blocks can be used to mark PLC-INTERFACE.
Adapters for the system cabling
The PLC-V8... adapter is used to connect 8 PLC-INTERFACE modules to the PLC system cabling for input and output functions. For more details, see page 369

6.2 mm design width
PLC-R...21 and PLC-O... relay and solid-state relay modules with PDT or N/O contact, designed for universal use. Available with screw, spring-cage or push-in connection.

14 mm design width
PLC-R...21-21 includes plug-in relays with two PDT contacts for switching capacities of up to 250 V AC/6 A. Available with screw, spring-cage, and push-in connection.

Feed-through terminal block
PLC-VT... is the feed-through terminal block for PLC-INTERFACE and the system cabling for passive signal transfer. For more details, see page 486

Sensors/actuators
PLC...SEN and PLC...ACT do not require additional supply/output terminal blocks. All connections are connected directly.

High currents
PLC...IC is ideal for high inrush currents, e.g., from lamp loads. PLC...HC are the modules to use for applications with high continuous load currents.

Railway applications
PLC...RW relay or solid-state relay modules are suitable for railway requirements. They are only available with spring-cage and push-in connection.

Interference signals on the input side
PLC-B...SO46 basic terminal blocks are used for filtering interference currents and interference voltages on the input side.

Accessories
The entire PLC-INTERFACE system can be extended with a wide range of accessories, such as power terminal blocks or plug-in bridges. For more details, see page 368
Universal PLC series with PDT relay

PLC-R... is the relay series that can be used universally and consists of basic terminal blocks and plug-in relays with PDT contacts.

The advantages:
- Slim design
- Screw, spring-cage, and push-in technology
- Functional plug-in bridges
- Integrated input and interference suppression circuit
- RT III sealed relay
- Safe isolation according to DIN EN 50178
- Efficient connection to system cabling using V8 adapter

Notes:
- Type of housing: Polyamide PA non-reinforced, color: green.
- Marking systems and mounting material: See Catalog 5
- 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....
- If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.
- For diagrams of operating voltage ranges, see page 343
- Note: for marking material (ZB 6), see “CLIPLINE industrial connection technology, marking material for terminals, conductors, and cables”.
- 1) 120 and 230 V types up to 55°C
- 3) 230 V types up to 55°C
- 3) EMC: Class A product, see page 571

Electrical interrupting rating for PLC...21 with 1-PDT relay

Electrical interrupting rating for PLC...21-21 with 2-PDT relay

Technical data

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Ordering data

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1 PDT with multi-layer gold contact

2 PDT with power contact

2 PDT with multi-layer gold contact

Input circuit: AC/DC Yellow LED, Bridge rectifier

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<th>11</th>
<th>9.2</th>
<th>4.8</th>
<th>3.5</th>
<th>3.2</th>
<th>33</th>
<th>18</th>
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Yellow LED, Protection against polarity reversal, freewheeling diode

AgNi, Bridge rectifier

<table>
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<th>Pcs. / Pkt.</th>
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</table>
Universal PLC series with solid-state relays

PLC-O... is the solid-state relay series that can be used universally consisting of basic terminal blocks and plug-in solid-state relays.

The advantages:
- Slim design
- Screw, spring-cage, and push-in technology
- Functional plug-in bridges
- Integrated input circuit
- RT-III sealed solid-state relays
- High switching capacity
- Zero voltage switch at AC output
- Efficient connection to system cabling using V8 adapter

Technical data

| Permissible range (with reference to \( U_n \)) | 0.8 - 1.2 |
| Switching level (with reference to \( U_n \)) | 1 signal \( \left( V \right) \) | 0.8 - 0.8 |
| | 0 signal \( \left( L \right) \) | 0.8 - 0.8 |
| Typ. input current at \( U_n \) \( [mA] \) | 8.5 | 9 |
| Typ. switch-on time at \( U_n \) \( [\text{ms}] \) | 0.02 | 0.03 |
| Typ. switch-off time at \( U_n \) \( [\text{ms}] \) | 0.3 | 0.3 |
| Transmission frequency \( f_{\text{lim}} \) \( [\text{Hz}] \) | 0.8 - 1.2 |

Switching level \( 1 \) signal \( \left( \text{\"H\"} \right) \) \( \geq 0.8 \) \( \geq 0.8 \) \( \geq 0.8 \) \( \geq 0.8 \) \( \geq 0.9 \) \( \geq 0.8 \)

Switching level \( 0 \) signal \( \left( \text{\"L\"} \right) \) \( \leq 0.4 \) \( \leq 0.3 \) \( \leq 0.4 \) \( \leq 0.4 \) \( \leq 0.3 \) \( \leq 0.3 \)

Typ. input current at \( U_n \) \( [\text{mA}] \) 8.5 - 9.5 3.3 - 3.5 8.5 - 9.5 3.3 - 3.5

Typ. switch-on time at \( U_n \) \( [\text{ms}] \) 0.02 - 0.03 0.04 - 0.04 0.02 - 0.03 0.04 - 0.04

Typ. switch-off time at \( U_n \) \( [\text{ms}] \) 0.3 - 0.3 0.3 - 0.4 0.3 - 0.3 0.3 - 0.4

Transmission frequency \( f_{\text{lim}} \) \( [\text{Hz}] \) 300 - 1000 300 - 1000 300 - 1000 300 - 1000

Input circuit DC Yellow LED, Protection against polarity reversal, freewheeling diode

Input circuit AC/DC Yellow LED, Bridge rectifier

Output data

Max. switching voltage 48 V DC

Min. switching voltage 3 V DC

Max. inrush current -

Min./max. switching current - / 100 mA

Output protection Protection against polarity reversal, Surge protection

Voltage drop at max. limiting continuous current \( \leq 1 \) V

Leakage current in off state -

Phase angle (\( \cos \phi \)) -

Max. load value -

General data

Test voltage input/output 2.5 kV (50 Hz, 1 min.)

Ambient temperature (operation) -25°C ... 60°C

Standards/regulations IEC 60664, EN 50178, IEC 62103

Pollution degree/surge voltage category 2 / III

Connection data solid / stranded / AWG 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

Dimensions W / H / D 6.2 mm / 80 mm / 94 mm

Ordering data

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<th>Description</th>
<th>Input voltage ( U_n )</th>
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<td>48 V DC</td>
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<tr>
<td></td>
<td>60 V DC</td>
</tr>
<tr>
<td></td>
<td>125 V DC</td>
</tr>
<tr>
<td></td>
<td>120 V AC (110 V DC)</td>
</tr>
<tr>
<td></td>
<td>230 V AC (220 V DC)</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td>24 V DC</td>
</tr>
<tr>
<td></td>
<td>48 V DC</td>
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<tr>
<td></td>
<td>60 V DC</td>
</tr>
<tr>
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<td>120 V AC (110 V DC)</td>
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<td></td>
<td>230 V AC (220 V DC)</td>
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<tr>
<td>PLC INTERFACE, with push-in connection</td>
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<td>120 V AC (110 V DC)</td>
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<td>230 V AC (220 V DC)</td>
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## Technical data

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<td>3</td>
<td>≤ 0.4 ≤ 0.4 ≤ 0.3 ≤ 0.3 ≤ 0.3 ≤ 0.3</td>
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</tbody>
</table>

Yellow LED, Protection against polarity reversal, freewheeling diode

33 V DC

3 V DC

15 A (10 ms)

- / 3 A (see derating curve)

Protection against polarity reversal, Surge protection

≤ 200 mV

- - - - -

2.5 kV (50 Hz, 1 min.)

-25°C...60°C

IEC 60964, EN 50178, IEC 62103

2 / III

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm

## Ordering data

<table>
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<td>0.8 - 0.8 - 0.8 - 0.8 - 0.9 - 0.9 - 1.2 - 1.2 - 1.2 - 1.1 - 1.1 - 1.1</td>
<td>2</td>
<td>≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8 ≥ 0.8</td>
<td>3</td>
<td>≤ 0.25 ≤ 0.25 ≤ 0.3 ≤ 0.3 ≤ 0.3 ≤ 0.25</td>
<td>4</td>
</tr>
</tbody>
</table>

Yellow LED, Bridge rectifier

253 V AC

24 V AC

30 A (10 ms)

10 mA / 0.75 A (see derating curve)

RCV circuit

< 1 V

< 1 mA (in off state)

0.5

4.5 A/s

2.5 kV (50 Hz, 1 min.)

-25°C...60°C

IEC 60964, EN 50178, IEC 62103

2 / III

0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

6.2 mm / 80 mm / 94 mm

## Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-OP- 24DC/ 24DC/ 2 (1)</td>
<td>2900364</td>
<td>10</td>
</tr>
<tr>
<td>PLC-OP- 24DC/ 24DC/ 2 (1)</td>
<td>2900365</td>
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<tr>
<td>PLC-OP- 60DC/ 24DC/ 2 (1)</td>
<td>2900366</td>
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<tr>
<td>PLC-OP- 125DC/ 24DC/ 2 (1)</td>
<td>2900367</td>
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<tr>
<td>PLC-OP- 230UC/ 24DC/ 2 (1)</td>
<td>2900368</td>
<td>10</td>
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</table>
Relay modules

**PLC series**

**PLC actuator series for output functions**

PLC actuator series for coupling controller and actuators, such as motors, contactors, valves, etc.

The advantages:
- Actuator connected directly to relay module
- No need for additional modular terminal blocks
- Space savings of up to 80%
- Time savings of up to 60%
- Screw, spring-cage, and push-in technology
- Relay modules with safe isolation according to DIN EN 50178 between coil and contact
- Functional plug-in bridges
- Efficient connection to system cabling using V8 adapter

---

**Technical data**

<table>
<thead>
<tr>
<th>Input data</th>
<th>Permissible range (with reference to ( U_{\text{N}} ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching level (with reference to ( U_{\text{N}} ))</td>
<td>1 signal (&quot;H&quot;)</td>
</tr>
<tr>
<td>Typ. input current at ( U_{\text{N}} )</td>
<td>[mA]</td>
</tr>
<tr>
<td>Typ. response time/switch-on time at ( U_{\text{N}} )</td>
<td>[ms]</td>
</tr>
<tr>
<td>Typ. release time/switch-off time at ( U_{\text{N}} )</td>
<td>[ms]</td>
</tr>
<tr>
<td>Transmission frequency ( f_{\text{limit}} )</td>
<td>[Hz]</td>
</tr>
<tr>
<td>Input circuit DC</td>
<td></td>
</tr>
</tbody>
</table>

| Output data | |
| Contact material | AgSnO |
| Max. switching voltage | 250 V AC/DC |
| Min. switching voltage | 5 V (at 100 mA) |
| Min. input current | 6 A |
| Max. switching current | 10 mA (at 12 V) |
| Min. release current | - |
| Phase angle \( \cos \phi \) | - |
| Max. load value | - |

| General data | Test voltage input/output |
| Ambient temperature (operation) | -40°C ... 60°C |
| Mechanical service life | 2 \( \times 10^7 \) cycles |
| Standards/regulations | IEC 60664, EN 50178, IEC 62103 |
| Pollution degree/surge voltage category | 3 / III |
| Connection data solid / stranded / AWG | 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 |
| Dimensions | 6.2 mm / 80 mm / 94 mm |

**Ordering data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage ( U_{\text{N}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td></td>
</tr>
<tr>
<td>1) 5 V DC</td>
<td>2) 24 V DC</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td></td>
</tr>
<tr>
<td>1) 5 V DC</td>
<td>2) 24 V DC</td>
</tr>
<tr>
<td>PLC INTERFACE, with push-in connection</td>
<td></td>
</tr>
<tr>
<td>1) 5 V DC</td>
<td>2) 24 V DC</td>
</tr>
</tbody>
</table>

---

Notes:
- Type of housing: Polyamide PA non-reinforced, color: green.
- Marking systems and mounting material
  - See Catalog 5
- 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....
- For diagrams of operating voltage ranges, see page 343
- For derating curves see page 345
  - 1) EMC: Class A product, see page 571

---

Yellow LED, Protection against polarity reversal, freewheeling diode

---

PLC actuator series for coupling controller and actuators, such as motors, contactors, valves, etc.

The advantages:
- Actuator connected directly to relay module
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- Functional plug-in bridges
- Efficient connection to system cabling using V8 adapter

---

![Diagram of PLC actuator series for output functions](image-url)

---

**Ordering data**

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**Technical data**

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<tr>
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<td>[ms]</td>
</tr>
<tr>
<td>Typ. release time/switch-off time at ( U_{\text{N}} )</td>
<td>[ms]</td>
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<td>Transmission frequency ( f_{\text{limit}} )</td>
<td>[Hz]</td>
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<td>Input circuit DC</td>
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| Output data | |
| Contact material | AgSnO |
| Max. switching voltage | 250 V AC/DC |
| Min. switching voltage | 5 V (at 100 mA) |
| Min. switching current | 6 A |
| Max. inrush current | (on request) |
| Min. switching current | 10 mA (at 12 V) |
| Output protection | - |
| Voltage drop at max. limiting continuous current | - |
| Leakage current in off state | - |
| Phase angle \( \cos \phi \) | - |
| Max. load value | - |

| General data | Test voltage input/output |
| Ambient temperature (operation) | -40°C ... 60°C |
| Mechanical service life | 2 \( \times 10^7 \) cycles |
| Standards/regulations | IEC 60664, EN 50178, IEC 62103 |
| Pollution degree/surge voltage category | 3 / III |
| Connection data solid / stranded / AWG | 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 |
| Dimensions | 6.2 mm / 80 mm / 94 mm |

---

Yellow LED, Protection against polarity reversal, freewheeling diode

---

PLC actuator series for coupling controller and actuators, such as motors, contactors, valves, etc.

The advantages:
- Actuator connected directly to relay module
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- Efficient connection to system cabling using V8 adapter

---

![Diagram of PLC actuator series for output functions](image-url)

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</tbody>
</table>
Relay modules
PLC series

Technical data

| See diagram | 0.8 - 0.8 | 1.2 - 1.2 |
| 18 | 8 | 10 |

Yellow LED, Protection against polarity reversal, freewheeling diode

AgNi
250 V AC/DC
5 V AC/DC
6 A
8 A
10 mA

- 33 V DC
3 V DC
3 A (see derating curve)
15 A (10 ms)

Protection against polarity reversal, Surge protection
≤ 200 mA

Test voltage input/output
4 kV AC (50 Hz, 1 min.)

-40°C ... 60°C
3 x 10⁷ cycles
IEC 60664, EN 50178, IEC 62103
3 / III
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
14 mm / 80 mm / 94 mm

Ordering data

<table>
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<th>Type</th>
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<tbody>
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Type | Order No. | Pcs. / Pkt.
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<tbody>
<tr>
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<tr>
<td>PLC-OPT- 5DC/24DC/2/ACT¹</td>
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<td>PLC-OPT- 24DC/24DC/2/ACT¹</td>
<td>2900376</td>
<td>10</td>
</tr>
</tbody>
</table>
# Relay modules

## PLC series

### PLC actuator series for output functions

PLC actuator series with solid-state power relays for coupling the controller and actuators, such as motors, contactors, valves, etc.

**Notes:**
- Type of housing: Polyamide PA non-reinforced, color: green.
- Marking systems and mounting material: See Catalog 5
- 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....
- For derating curves see page 345

## Technical data

<table>
<thead>
<tr>
<th>Input data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Permissible range (with reference to ( U_{\text{in}} ))</strong></td>
</tr>
</tbody>
</table>
| **Switching level (with reference to \( U_{\text{in}} \))** | 1 signal ("H") ≥ 0.8  
0 signal ("L") ≤ 0.4 |
| **Typ. input current at \( U_{\text{in}} \) [mA]** | 9 |
| **Typ. switch-on time at \( U_{\text{in}} \) [ms]** | 0.02 |
| **Typ. switch-off time at \( U_{\text{in}} \) [ms]** | 0.4 |
| **Transmission frequency \( f_{\text{limit}} \) [Hz]** | 300 |

<table>
<thead>
<tr>
<th>Output data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max./min. switching voltage</strong></td>
</tr>
<tr>
<td><strong>Max. inrush current</strong></td>
</tr>
<tr>
<td><strong>Output protection</strong></td>
</tr>
<tr>
<td><strong>Leakage current in off state</strong></td>
</tr>
<tr>
<td><strong>Phase angle (( \cos \phi ))</strong></td>
</tr>
<tr>
<td><strong>Max. load value</strong></td>
</tr>
</tbody>
</table>

## Ordering data

**PLC INTERFACE, with screw connection**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
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</tr>
</thead>
<tbody>
<tr>
<td>PLC-OSC-24DC/24DC/5/ACT</td>
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**PLC-OSC-24DC/230AC/2/ACT**

<table>
<thead>
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<th>Type</th>
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<tr>
<td>PLC-OSC-24DC/230AC/2/ACT</td>
<td>2982760</td>
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</tbody>
</table>
PLC actuator series for output functions

PLC actuator basic terminal blocks that can be fitted with a mechanical or solid-state relay. For coupling the controller and actuators, such as motors, contactors, valves, etc.

Notes:
- Maximum interrupting rating diagrams, see page 346
- For derating curves see page 345
- 1) EMC: Class A product, see page 571

### Technical data

**Input data**
- Permissible range (with reference to \( U_{\text{N}} \)): 0.8 ... 1.2
- Typ. input current with \( U_{\text{N}} \) (50 / 60 Hz): 15.6 mA / 8.5 mA
- Typ. response time at \( U_{\text{N}} \): 5 ms
- Typ. release time at \( U_{\text{N}} \): 30 ms
- Input circuit: LED yellow, Bridge rectifier

**Output data with:**
- REL-MR-24DC/21AU: Single contact, 1 N/O contact
- REL-MR-24DC/21: Single contact, 1 N/O contact

**Contact type**
- AgSnO, hard gold-plated
- Min. switching voltage: 30 V AC / 36 V DC
- Min. switching voltage: 100 mA (at 10 mA)
- Limiting continuous current: 50 mA
- Min. switching current: 1 mA (at 24 V)
- Output protection: -
- Voltage drop at limiting continuous current: -
- Leakage current in off state: -
- Max. load value \( I_2 \times t \) (\( t = 10 \text{ ms} \)): 4.5 A \( \text{ms} \)

**General data**
- Rated insulation voltage: 250 V AC
- Rated surge voltage / insulation: 6 kV / Safe isolation, increased insulation
- Ambient temperature (operation): -20°C ... 60°C
- Air and creepage distances: EN 50178, IEC 62103
- Pollution degree / Surge voltage category: 2 / III
- Dimensions: 6.2 mm / 80 mm / 94 mm

**Ordering data**

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<td>REL-MR-24DC21</td>
<td>2961105</td>
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<tr>
<td>OPT-24DC/48DC/100</td>
<td>2966618</td>
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<tr>
<td>OPT-24DC/24DC/2</td>
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### Accessories

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<td>REL-MR-24DC21</td>
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<td>10</td>
</tr>
</tbody>
</table>

### Technical data

**Input data**
- Permissible range (with reference to \( U_{\text{N}} \)): 0.8 ... 1.2
- Typ. input current with \( U_{\text{N}} \) (50 / 60 Hz): 15 mA / 8.3 mA
- Typ. response time at \( U_{\text{N}} \): 10 ms
- Typ. release time at \( U_{\text{N}} \): 20 ms
- Input circuit: Yellow LED, Bridge rectifier

**Output data with:**
- OPT-24DC/100: Single contact, 1 N/O contact
- OPT-24DC/24DC/2: Single contact, 1 N/O contact
- OPT-24DC/230AC/1: Single contact, 1 N/O contact

**Contact type**
- AgSnO, hard gold-plated
- Min. switching voltage: 48 V DC
- Min. switching voltage: 3 V DC
- Limiting continuous current: 3 A
- Min. switching current: 1 mA (at 24 V)

**General data**
- Rated insulation voltage: 250 V AC
- Rated surge voltage / insulation: 6 kV / Safe isolation, increased insulation
- Ambient temperature (operation): -20°C ... 60°C
- Air and creepage distances: EN 50178, IEC 62103
- Pollution degree / Surge voltage category: 2 / III
- Dimensions: 6.2 mm / 80 mm / 94 mm

**Ordering data**

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<th>Type</th>
<th>Order No.</th>
<th>Pcs / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-BSC-24UC/1/ACT</td>
<td>2982799</td>
<td>10</td>
</tr>
<tr>
<td>PLC-BSP-24UC/1/ACT</td>
<td>2982809</td>
<td>10</td>
</tr>
<tr>
<td>PLC-BPT-24UC/1/ACT1)</td>
<td>2900450</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-24DC21AU</td>
<td>2961121</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-24DC21</td>
<td>2961105</td>
<td>10</td>
</tr>
<tr>
<td>OPT-24DC/48DC/100</td>
<td>2966618</td>
<td>10</td>
</tr>
<tr>
<td>OPT-24DC/24DC/2</td>
<td>2966695</td>
<td>10</td>
</tr>
<tr>
<td>OPT-24DC/230AC/1</td>
<td>2967950</td>
<td>10</td>
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### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-MR-24DC21AU</td>
<td>2961121</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-24DC21</td>
<td>2961105</td>
<td>10</td>
</tr>
</tbody>
</table>
PLC sensor series for input functions

PLC sensor series for coupling controller and sensors, such as proximity switches, limit switches or auxiliary contacts

The advantages:

- Direct connection of sensor to relay module
- No need for additional modular terminal blocks
- Space savings of up to 80%
- Time savings of up to 60%
- Screw, spring-cage, and push-in technology
- Relay modules with safe isolation according to DIN EN 50178 between coil and contact
- Functional plug-in bridges
- Efficient connection to system cabling using V8 adapter

### Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>Permissible range (with reference to ( U_{IN} ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching level (with reference to ( U_{IN} ))</td>
<td>1 signal (&quot;H&quot;) 0 signal (&quot;L&quot;)</td>
</tr>
<tr>
<td>Typ. input current at ( U_{IN} ) [mA]</td>
<td>9 3.5 3.2</td>
</tr>
<tr>
<td>Typ. response time/switch-on time at ( U_{IN} ) [ms]</td>
<td>5 6 7</td>
</tr>
<tr>
<td>Typ. release time/switch-off time at ( U_{IN} ) [ms]</td>
<td>8 15 15</td>
</tr>
<tr>
<td>Transmission frequency ( f_{SW} ) [Hz]</td>
<td></td>
</tr>
<tr>
<td>Input circuit DC</td>
<td></td>
</tr>
<tr>
<td>Input circuit AC/DC</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Output data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact material</td>
</tr>
<tr>
<td>Max. switching voltage</td>
</tr>
<tr>
<td>Min. switching voltage</td>
</tr>
<tr>
<td>Limiting continuous current</td>
</tr>
<tr>
<td>Max. inrush current</td>
</tr>
<tr>
<td>Min. switching current</td>
</tr>
<tr>
<td>Output protection</td>
</tr>
<tr>
<td>Voltage drop at max. limiting continuous current</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test voltage input/output</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
</tr>
<tr>
<td>Mechanical service life</td>
</tr>
<tr>
<td>Standards/regulations</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
</tr>
<tr>
<td>Dimensions</td>
</tr>
</tbody>
</table>

| Notes: |
| Type of housing: Polyamide PA non-reinforced, color: green. |
| Marking systems and mounting material | See Catalog 5 |
| 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.... |
| If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact. |
| For diagrams of operating voltage ranges, see page 343 |
| 1) 120 and 230 V types up to 55°C |
| 2) EMC: Class A product, see page 571 |

| Relay module |
| 1 N/O contact |

<table>
<thead>
<tr>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>See diagram</td>
</tr>
<tr>
<td>Yellow LED, Protection against polarity reversal, freewheeling diode</td>
</tr>
<tr>
<td>Yellow LED, Bridge rectifier</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input voltage ( U_{IN} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
</tr>
<tr>
<td>①</td>
</tr>
<tr>
<td>②</td>
</tr>
<tr>
<td>③</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
</tr>
<tr>
<td>①</td>
</tr>
<tr>
<td>②</td>
</tr>
<tr>
<td>③</td>
</tr>
<tr>
<td>PLC INTERFACE, with push-in connection</td>
</tr>
<tr>
<td>①</td>
</tr>
<tr>
<td>②</td>
</tr>
<tr>
<td>③</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-RSC-24DC/1AU/SEN</td>
<td>2966317</td>
<td>10</td>
</tr>
<tr>
<td>PLC-RSC-120UC/1AU/SEN</td>
<td>2966320</td>
<td>10</td>
</tr>
<tr>
<td>PLC-RSC-230UC/1AU/SEN</td>
<td>2966333</td>
<td>10</td>
</tr>
<tr>
<td>PLC-RSP-24DC/1AU/SEN</td>
<td>2967374</td>
<td>10</td>
</tr>
<tr>
<td>PLC-RSP-120UC/1AU/SEN</td>
<td>2967390</td>
<td>10</td>
</tr>
<tr>
<td>PLC-RSP-230UC/1AU/SEN</td>
<td>2967413</td>
<td>10</td>
</tr>
<tr>
<td>PLC-RPT-24DC/1AU/SEN</td>
<td>2900313</td>
<td>10</td>
</tr>
<tr>
<td>PLC-RPT-120UC/1AU/SEN</td>
<td>2900314</td>
<td>10</td>
</tr>
<tr>
<td>PLC-RPT-230UC/1AU/SEN</td>
<td>2900315</td>
<td>10</td>
</tr>
</tbody>
</table>

PLC series

Relay modules

PLC INTERFACE, with screw connection

Distances: W = 6.2 mm, H = 80 mm, D = 94 mm

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage ( U_{IN} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td></td>
</tr>
<tr>
<td>①</td>
<td>24 V DC</td>
</tr>
<tr>
<td>②</td>
<td>120 V AC (110 V DC)</td>
</tr>
<tr>
<td>③</td>
<td>230 V AC (220 V DC)</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td></td>
</tr>
<tr>
<td>①</td>
<td>24 V DC</td>
</tr>
<tr>
<td>②</td>
<td>120 V AC (110 V DC)</td>
</tr>
<tr>
<td>③</td>
<td>230 V AC (220 V DC)</td>
</tr>
<tr>
<td>PLC INTERFACE, with push-in connection</td>
<td></td>
</tr>
<tr>
<td>①</td>
<td>24 V DC</td>
</tr>
<tr>
<td>②</td>
<td>120 V AC (110 V DC)</td>
</tr>
<tr>
<td>③</td>
<td>230 V AC (220 V DC)</td>
</tr>
</tbody>
</table>

Notes:

- Type of housing: Polyamide PA non-reinforced, color: green.
- Marking systems and mounting material: See Catalog 5.
- 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....
- If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.
- For diagrams of operating voltage ranges, see page 343.

1) 120 and 230 V types up to 55°C.
2) EMC: Class A product, see page 571.

Relay module 1 N/O contact
Max. DC voltage output of 100 mA

<table>
<thead>
<tr>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>0.8 -</td>
</tr>
<tr>
<td>1.2</td>
</tr>
<tr>
<td>≥ 0.8</td>
</tr>
<tr>
<td>≥ 0.8</td>
</tr>
<tr>
<td>≤ 0.4</td>
</tr>
<tr>
<td>0.02</td>
</tr>
<tr>
<td>≤ 0.4</td>
</tr>
<tr>
<td>8.5</td>
</tr>
<tr>
<td>3.5</td>
</tr>
</tbody>
</table>

Yellow LED, Protection against polarity reversal, freewheeling diode
Yellow LED, Bridge rectifier

- 48 V DC
- 3 V DC
- 100 mA
- Protection against polarity reversal, Surge protection
≤ 1 V

2.5 kV (50 Hz, 1 min.)
-25°C ... 60°C
IEC 00664, EN 50178, IEC 62103
2 / III
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
6.2 mm / 80 mm / 94 mm

<table>
<thead>
<tr>
<th>Ordering data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>PLC-OSC-24DC/48DC/100/SEN2</td>
</tr>
<tr>
<td>PLC-OSC-120UC/48DC/100/SEN2</td>
</tr>
<tr>
<td>PLC-OSC-230UC/48DC/100/SEN2</td>
</tr>
<tr>
<td>PLC-OSP-24DC/48DC/100/SEN2</td>
</tr>
<tr>
<td>PLC-OSP-120UC/48DC/100/SEN2</td>
</tr>
<tr>
<td>PLC-OSP-230UC/48DC/100/SEN2</td>
</tr>
<tr>
<td>PLC-OPT-24DC/48DC/100/SEN2</td>
</tr>
<tr>
<td>PLC-OPT-120UC/48DC/100/SEN2</td>
</tr>
<tr>
<td>PLC-OPT-230UC/48DC/100/SEN2</td>
</tr>
</tbody>
</table>
Relay modules

PLC series

PLC-INTERFACE for high inrush currents

PLC relay modules for high inrush currents due, for example, to capacitive loads.

The advantages:
- Max. inrush current of 130 A
- Direct connection of load return line thanks to actuator type
- Screw, spring-cage, and push-in technology
- Safe isolation according to DIN EN 50178 between coil and contact
- Functional plug-in bridges
- Efficient connection to system cabling using V8 adapter

Notes:
- Type of housing: Polyamide PA non-reinforced, color: green.
- Marking systems and mounting material: See Catalog 5
- 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....
- For diagrams of operating voltage ranges, see page 343
- 1) EMC: Class A product, see page 571

1 N/O contact of up to 130 A peak

Technical data

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
</tr>
<tr>
<td>PLC-INTERFACE, with push-in connection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-RSC-24DC/1IC/ACT1</td>
<td>2967604</td>
<td>10</td>
</tr>
<tr>
<td>PLC-RSP-24DC/1IC/ACT1</td>
<td>2912413</td>
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</tr>
<tr>
<td>PLC-RPT-24DC/1IC/ACT1</td>
<td>2900298</td>
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</tbody>
</table>

Ordering data

Max. interrupting rating

Switching current [A] vs. Switching voltage [V]

AC, ohmic load
DC, ohmic load
DC, LR = 40 ms

Notes:
- Type of housing:
- Very high input current
- Voltage increases with an e-function

Input data
- Typ. input current at U_in [mA]
- Response/release time at U_in [ms]
- Input circuit DC
- Output data
- Contact material
- Max. switching voltage
- Min. switching voltage
- Max. inrush current

General data
- Test voltage input/output
- Ambient temperature (operation)
- Mechanical service life
- Standards/regulations
- Connection data solid / stranded / AWG
- Dimensions W / H / D

Max. switching voltage 250 V AC/DC
Min. switching voltage 12 V AC/DC (at 100 mA)
Max. inrush current 80 A (for 20 ms) / 130 A (peak, at capacitive load, 230 V AC, 23 μF)

4 kV AC (50 Hz, 1 min.)
-40°C ... 60°C
3 x 10^7 cycles
IEC 60664, EN 50178, IEC 62103
0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
14 mm / 80 mm / 94 mm

For diagrams of operating voltage ranges, see page 343

1) EMC: Class A product, see page 571

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
**PLC-INTERFACE for high continuous currents**

PLC relay modules for high continuous switching currents

The advantages:
- Max. continuous current of 10 A
- Safe isolation according to DIN EN 50178 between coil and contact
- Screw, spring-cage, and push-in technology
- Functional plug-in bridges
- Efficient connection to system cabling using V8 adapter
- Long electrical service life thanks to 16 A relay
- All common input voltages of 12 V DC to 230 V AC

---

**Technical data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_i$</th>
<th>[mA]</th>
<th>Response/release time at $U_i$</th>
<th>[ms]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typ. input current at $U_i$</td>
<td>33 18 17.5 20 10 4.5 4.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response/release time at $U_i$</td>
<td>8 / 10 8 / 10 8 / 10 8 / 10 8 / 10 7 / 10 7 / 10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Input circuit DC

- Yellow LED, Protection against polarity reversal, freewheeling diode

Input circuit AC/DC

- Yellow LED, Bridge rectifier

**Output data**

- Contact material: AgNi
- Max. switching voltage: 250 V AC/DC
- Min. switching voltage: 12 V AC/DC
- Limiting continuous current: 10 A
- Max. inrush current: 30 A (300 ms)
- Min. switching current: 100 mA

**General data**

- Test voltage input/output: 4 kV AC (50 Hz, 1 min.)
- Ambient temperature (operation): -40°C ... 60°C
- Mechanical service life: 3 x 10⁷ cycles
- Standards/regulations:
  - IEC 60664, EN 50178, IEC 62103
  - 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
  - 14 mm / 80 mm / 94 mm

**Ordering data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_i$</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td>12 V DC</td>
<td>PLC-RSC-12DC/21HC(2)</td>
<td>2967617</td>
<td>10</td>
</tr>
<tr>
<td>24 V DC</td>
<td>PLC-RSC-24DC/21HC(2)</td>
<td>2967620</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>24 V AC/DC</td>
<td>PLC-RSC-24UC/21HC(2)</td>
<td>2967633</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>48 V DC</td>
<td>PLC-RSC-48DC/21HC(2)</td>
<td>2967646</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>60 V DC</td>
<td>PLC-RSC-60DC/21HC(2)</td>
<td>2967659</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>120 V AC (110 V DC)</td>
<td>PLC-RSC-120UC/21HC(2)</td>
<td>2967662</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>230 V AC (220 V DC)</td>
<td>PLC-RSC-230UC/21HC(2)</td>
<td>2967675</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

- Type of housing: Polyamide PA non-reinforced, color: green.
- Marking systems and mounting material
  - See Catalog 5
- 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....
- For diagrams of operating voltage ranges, see page 343
  - 1) 230 V types up to 55°C
  - 2) EMC: Class A product, see page 571

---

For additional information, visit www.phoenixcontact.net/products
Basic terminal blocks with interference current filter that can be fitted with relays

PLC basic terminal blocks with integrated filter to protect against interference voltages or currents due, for example, to long control lines

The advantages:
- Resistant to interference currents
- High relay release voltage

Typical applications:
- Applications with long control lines
- Use of AC output boards, resulting in residual AC currents
- Screw, spring-cage, and push-in technology

### Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal input voltage $U_{ni}$</td>
<td></td>
</tr>
<tr>
<td>Permissible range (with reference to $U_{ni}$)</td>
<td>0.8 ... 1.4</td>
</tr>
<tr>
<td>Typ. release voltage (with relay)</td>
<td>50 V AC</td>
</tr>
<tr>
<td>Typ. input current with $U_{ni}$ (50/60 Hz)</td>
<td>7 mA / 8 mA</td>
</tr>
<tr>
<td>Typ. response time at $U_{ni}$</td>
<td>7 ms</td>
</tr>
<tr>
<td>Typ. release time at $U_{ni}$</td>
<td>20 ms</td>
</tr>
<tr>
<td>Input circuit</td>
<td>Yellow LED, Bridge rectifier, Filter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output data with:</th>
<th>REL-MR-60DC/21AU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact type</td>
<td>Single contact, 1-PDT</td>
</tr>
<tr>
<td>Contact material</td>
<td>AgSnO, hard gold-plated</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>250 V AC/DC</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>5 V AC/DC</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>10 mA</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>1 mA</td>
</tr>
<tr>
<td>Max. inrush current (on request)</td>
<td>50 mA</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>100 mA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Test voltage input/output</td>
<td>4 kV (50 Hz, 1 min.)</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-20°C ... 55°C</td>
</tr>
<tr>
<td>Mechanical service life</td>
<td>2 x 10^7 cycles</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>IEC 60664, EN 50178, IEC 62103</td>
</tr>
<tr>
<td>Pollution degree / Surge voltage category</td>
<td>3 / III</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>W / H / D</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2 mm / 80 mm / 94 mm</td>
<td></td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Voltage $U_{ni}$</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-INTERFACE basic terminal block, for plug-in miniature relays or solid-state relays</td>
<td>120 V AC</td>
<td>PLC-BSC-120UC/21</td>
<td>2980319</td>
<td>10</td>
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<tr>
<td>With screw connection</td>
<td>230 V AC</td>
<td>PLC-BSC-230UC/21</td>
<td>2980335</td>
<td>10</td>
</tr>
<tr>
<td>With spring-cage connection</td>
<td>120 V AC</td>
<td>PLC-BSP-120UC/21SO46</td>
<td>2980351</td>
<td>10</td>
</tr>
<tr>
<td>With push-in connection</td>
<td>230 V AC</td>
<td>PLC-BSP-230UC/21SO46</td>
<td>2980377</td>
<td>10</td>
</tr>
<tr>
<td>With push-in connection</td>
<td>120 V AC</td>
<td>PLC-BPT-120UC/21SO46</td>
<td>2980453</td>
<td>10</td>
</tr>
<tr>
<td>With push-in connection</td>
<td>230 V AC</td>
<td>PLC-BPT-230UC/21SO46</td>
<td>2980455</td>
<td>10</td>
</tr>
</tbody>
</table>

### Accessories

| REL-MR-60DC/21AU | 2961134 | 10 |

| REL-MR-60DC/21 | 2961118 | 10 |
### Technical Data

- **REL-MR-60DC/21AU**
  - Single contact, 1 N/O contact
  - AgSnO
  - 250 V AC/DC
  - 5 V (at 100 mA)
  - 10 mA (at 12 V)
  - 4 kV (50 Hz, 1 min.)
  - -20°C ... 55°C
  - 2 x 10⁷ cycles
  - IEC 60969, EN 50178, IEC 62103
  - 3 / III
  - 10 A
  - 6.2 mm / 80 mm / 94 mm

- **REL-MR-60DC/21**
  - Single contact, 1 N/O contact
  - AgSnO, hard gold-plated
  - 250 V AC/DC
  - 5 V (at 100 mA)
  - 10 mA (at 12 V)
  - 4 kV (50 Hz, 1 min.)
  - -20°C ... 55°C
  - 2 x 10⁷ cycles
  - IEC 60969, EN 50178, IEC 62103
  - 3 / III
  - 10 A
  - 6.2 mm / 80 mm / 94 mm

### Ordering Data

- **PLC-BSC-120UC/1/SEN/SO461)**
  - Order No.: 2980312
  - 10

- **PLC-BSC-120UC/1/SEN/SO461)**
  - Order No.: 2980348
  - 10

- **PLC-BSC-230UC/1/SEN/SO461)**
  - Order No.: 2980364
  - 10

- **PLC-BPT-120UC/1/SEN/SO461)**
  - Order No.: 2980380
  - 10

- **PLC-BPT-230UC/1/SEN/SO461)**
  - Order No.: 2980406
  - 10

- **PLC-BPT-230UC/21HC**
  - Order No.: 2980406
  - 10

- **REL-MR-60DC/21AU**
  - Order No.: 2961134
  - 10

- **REL-MR-60DC/21**
  - Order No.: 2961118
  - 10

- **REL-MR-110DC/21AU**
  - Order No.: 2961228
  - 10

- **REL-MR-110DC/21**
  - Order No.: 2961202
  - 10

- **REL-MR-110DC/21HC**
  - Order No.: 2961338
  - 10

For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT

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- (800) 258-9200
- sales@steveneng.com
- www.stevenengineering.com
### Notes:

<table>
<thead>
<tr>
<th>Type of housing: Polyamide PA non-reinforced, color: green.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marking systems and mounting material See Catalog 5</td>
</tr>
<tr>
<td>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....</td>
</tr>
<tr>
<td>For derating curves see page 345</td>
</tr>
<tr>
<td>1) EMC: Class A product, see page 571</td>
</tr>
</tbody>
</table>

### Technical data

**Nominal input voltage** UN 120 V AC 230 V AC<br>
**Permissible range (with reference to UN)** 0.85 ... 1.1 0.8 ... 1.1<br>
**Switching level (with optocoupler)** 0 signal (“L”) ≤ 0.4<br>
**Typ. input current with UN (50 / 60 Hz)** 7 mA / 8 mA 8.8 mA / 10 mA<br>
**Typ. response time/switch-on time at UN** 6 ms 6 ms<br>
**Typ. switch-off time at UN** 10 ms 10 ms<br>
**Input circuit** Yellow LED, Bridge rectifier, Filter<br>
**Output data with:** OPT...48DC/... OPT...24DC/... OPT...230AC/...<br>
**Max. switching voltage** 48 V DC 30 V DC 253 V AC<br>
**Min. switching voltage** 3 V DC 3 V DC 24 V AC<br>
**Limiting continuous current** 100 mA 3 A 0.75 A<br>
**Max. inrush current** 15 A (10 ms) 30 A (10 ms)<br>
**Output protection** Protection against polarity reversal, Surge protection<br>
**RCV circuit**<br>
**Voltage drop at limiting continuous current** < 1 V DC < 200 mV < 1 V AC<br>
**Leakage current in off state** - - < 1 mA<br>
**Max. phase shift (inductive consumer)** - - 0.5<br>
**Max. load value I² x t (t = 10 ms)** - - 4.5 A²s<br>
**General data**<br>
**Test voltage input/output** 2.5 kV (50 Hz, 1 min.)<br>
**Ambient temperature (operation)** -20°C ... 55°C<br>
**Standards/regulations** IEC 60664, EN 50178, IEC 62103<br>
**Pollution degree / Surge voltage category** 2 / III<br>
**Connection data solid / stranded / AWG** 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14<br>
**Dimensions** W / H / D 6.2 mm / 80 mm / 94 mm

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Voltage UN</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-INTERFACE basic terminal block, for plug-in miniature relays or solid-state relays</td>
<td>-</td>
<td>2980319</td>
<td>10</td>
</tr>
<tr>
<td>With screw connection</td>
<td>120 V AC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>With screw connection</td>
<td>230 V AC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>With spring-cage connection</td>
<td>120 V AC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>With spring-cage connection</td>
<td>230 V AC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>With push-in connection</td>
<td>120 V AC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>With push-in connection</td>
<td>230 V AC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Plug-in solid-state relays</td>
<td>-</td>
<td>2966621</td>
<td>10</td>
</tr>
<tr>
<td>Solid-state input relays</td>
<td>-</td>
<td>2966605</td>
<td>10</td>
</tr>
<tr>
<td>Solid-state power relays</td>
<td>-</td>
<td>2967963</td>
<td>10</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT-60DC / 48DC/100</td>
<td>2966621</td>
<td>10</td>
</tr>
<tr>
<td>OPT-60DC / 24DC / 2</td>
<td>2966605</td>
<td>10</td>
</tr>
<tr>
<td>OPT-60DC / 230AC / 1</td>
<td>2967963</td>
<td>10</td>
</tr>
</tbody>
</table>
Technical data

<table>
<thead>
<tr>
<th>Voltage</th>
<th>120 V AC</th>
<th>230 V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>0.85 ... 1.1 A</td>
<td>0.85 ... 1.1 A</td>
</tr>
<tr>
<td>Power</td>
<td>0.8 ... 1.1 W</td>
<td>0.8 ... 1.1 W</td>
</tr>
<tr>
<td>&lt; 0.4 W</td>
<td>≤ 0.4 W</td>
<td>≤ 0.4 W</td>
</tr>
<tr>
<td>&lt; 8 mA</td>
<td>7 mA / 8 mA</td>
<td>7 mA / 8 mA</td>
</tr>
<tr>
<td>&gt; 6 ms</td>
<td>6 ms</td>
<td>6 ms</td>
</tr>
<tr>
<td>&lt; 10 ms</td>
<td>10 ms</td>
<td>10 ms</td>
</tr>
</tbody>
</table>

Yellow LED, Bridge rectifier, Filter

OPT-60DC/...  | OPT-24DC/...  | OPT-230AC/... |
30 V DC      | 253 V AC     | 30 V DC      |
3 A          | 24 V AC      | 3 A          |
30 A (10 ms) | 30 A (10 ms) | 30 A (10 ms) |

Protection against polarity reversal, Surge protection

RCV circuit

< 1 V         | < 200 mV    | < 1 V        |
< 1 mA        | < 1 mA      | < 1 mA       |
< 0.5 mA      | < 0.5 mA    | < 0.5 mA     |
< 4.5 A/s     | < 4.5 A/s   | < 4.5 A/s    |

Standards/regulations

IEC 60664, EN 50178, IEC 62103

2 / III

Connection data

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-BSC-120UC/1/SEN/ISO46º</td>
<td>2980322</td>
<td>10</td>
</tr>
<tr>
<td>PLC-BSC-230UC/1/SEN/ISO46º</td>
<td>2980348</td>
<td>10</td>
</tr>
<tr>
<td>PLC-BSP-120UC/1/SEN/ISO46º</td>
<td>2980364</td>
<td>10</td>
</tr>
<tr>
<td>PLC-BSP-230UC/1/SEN/ISO46º</td>
<td>2980380</td>
<td>10</td>
</tr>
<tr>
<td>PLC-BPT-120UC/1/SEN/ISO46º</td>
<td>2900456</td>
<td>10</td>
</tr>
<tr>
<td>PLC-BPT-230UC/1/SEN/ISO46º</td>
<td>2900457</td>
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</table>

Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPT-60DC/48DC/100</td>
<td>2966621</td>
<td>10</td>
</tr>
<tr>
<td>OPT-60DC/24DC/2</td>
<td>2966605</td>
<td>10</td>
</tr>
<tr>
<td>OPT-60DC/230AC/1</td>
<td>2967963</td>
<td>10</td>
</tr>
</tbody>
</table>
Plug-in miniature power relays suitable for PLC-INTERFACE and RIF-0, RIF-1, and PR1 relay bases.

The advantages:
- Power contacts up to 16 A
- Multi-layer gold contact or power contact
- High degree of protection up to RT III (comparable with IP67) depending on type
- Safe isolation according to DIN EN 50178 between coil and contact

### Technical data

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-MR- 4,5DC/21</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 4,5DC/21AU</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 12DC/21</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 12DC/21AU</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 18DC/21</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 24DC/21</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 24DC/21AU</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 60DC/21</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR- 60DC/21AU</td>
<td>10</td>
</tr>
</tbody>
</table>

### Input data

<table>
<thead>
<tr>
<th>Type</th>
<th>Input voltage U_n</th>
<th>Plugs in miniature power relays</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>4.5 V DC</td>
<td>REL-MR- 4,5DC/21</td>
</tr>
<tr>
<td>②</td>
<td>12 V DC</td>
<td>REL-MR- 12DC/21</td>
</tr>
<tr>
<td>③</td>
<td>18 V DC</td>
<td>REL-MR- 18DC/21</td>
</tr>
<tr>
<td>④</td>
<td>24 V DC</td>
<td>REL-MR- 24DC/21</td>
</tr>
<tr>
<td>⑤</td>
<td>60 V DC</td>
<td>REL-MR- 60DC/21</td>
</tr>
<tr>
<td>⑥</td>
<td>110 V DC</td>
<td>REL-MR- 60DC/21AU</td>
</tr>
<tr>
<td>⑦</td>
<td>4.5 V DC</td>
<td>REL-MR- 4,5DC/21AU</td>
</tr>
<tr>
<td>⑧</td>
<td>12 V DC</td>
<td>REL-MR- 12DC/21AU</td>
</tr>
<tr>
<td>⑨</td>
<td>18 V DC</td>
<td>REL-MR- 18DC/21AU</td>
</tr>
<tr>
<td>⑩</td>
<td>24 V DC</td>
<td>REL-MR- 24DC/21AU</td>
</tr>
<tr>
<td>⑪</td>
<td>60 V DC</td>
<td>REL-MR- 60DC/21AU</td>
</tr>
<tr>
<td>⑫</td>
<td>110 V DC</td>
<td>REL-MR- 60DC/21AU</td>
</tr>
</tbody>
</table>

### Contact type

- Single contact, 1-PDT
- Single contact, 1-PDT

### Contact material

- AgSnO
- AgSnO, hard gold-plated
- AgNi
- AgNi, hard gold-plated

### Dimensions

- W H D

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage U_n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in miniature power relay with power contact</td>
<td></td>
</tr>
<tr>
<td>REL-MR- 4,5DC/21</td>
<td>REL-MR- 12DC/21</td>
</tr>
<tr>
<td>REL-MR- 18DC/21</td>
<td>REL-MR- 24DC/21</td>
</tr>
<tr>
<td>REL-MR- 60DC/21</td>
<td>REL-MR- 60DC/21AU</td>
</tr>
</tbody>
</table>

### Notes:

- If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.
- For dimensional drawings and perforations for assembly, see page 343.
- For diagrams of operating voltage ranges, see page 343.

---

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PHOENIX CONTACT
### Technical data

#### Single contact, 2-PDT

- **AgNi**
  - 250 V AC/DC: 100 mA (at 10 mA)
- 25 A (20 ms):
  - 50 mA
- 10 mA (at 5 V):
  - 1 mA (at 24 V)

#### Single contact, 1-PDT

- **AgSnO**
  - 250 V AC/DC: 12 V (at 100 mA)
- 16 A
- 100 mA (at 12 V DC)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. switching voltage</td>
<td>5 V (at 100 mA)</td>
</tr>
<tr>
<td>Max. inrush current</td>
<td>25 A (20 ms)</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>10 mA (at 12 V DC)</td>
</tr>
<tr>
<td>Max. inrush current (on request)</td>
<td>25 A (20 ms)</td>
</tr>
<tr>
<td>Min. switching current (on request)</td>
<td>100 mA (at 12 V DC)</td>
</tr>
<tr>
<td>Dimensions W / H / D</td>
<td>5 mm / 28 mm / 15 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>-24 V DC: 140 W</td>
</tr>
<tr>
<td>Power</td>
<td>-48 V DC: 20 W</td>
</tr>
<tr>
<td>Voltage</td>
<td>-60 V DC: 18 W</td>
</tr>
<tr>
<td>Nominal operating mode</td>
<td>100% operating factor</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>IEC 60664, EN 50178, IEC 62103</td>
</tr>
<tr>
<td>Mounting position/mounting</td>
<td>Any / In rows with zero spacing (≥ 2.5 mm)</td>
</tr>
<tr>
<td>Ordering data</td>
<td>Type Order No. Pos. / Pkt.</td>
</tr>
<tr>
<td>REL-MR-12DC/21-21</td>
<td>2961257 10</td>
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<tr>
<td>REL-MR-24DC/21-21</td>
<td>2961192 10</td>
</tr>
<tr>
<td>REL-MR-60DC/21-21</td>
<td>2961273 10</td>
</tr>
<tr>
<td>REL-MR-110DC/21-21</td>
<td>2961202 10</td>
</tr>
<tr>
<td>REL-MR-12DC/21-21AU</td>
<td>2961299 10</td>
</tr>
<tr>
<td>REL-MR-24DC/21-21AU</td>
<td>2961215 10</td>
</tr>
<tr>
<td>REL-MR-60DC/21-21AU</td>
<td>2961286 10</td>
</tr>
<tr>
<td>REL-MR-110DC/21-21AU</td>
<td>2961228 10</td>
</tr>
<tr>
<td>REL-MR-12DC/21HC</td>
<td>2961309 10</td>
</tr>
<tr>
<td>REL-MR-24DC/21HC</td>
<td>2961312 10</td>
</tr>
<tr>
<td>REL-MR-60DC/21HC</td>
<td>2961325 10</td>
</tr>
<tr>
<td>REL-MR-110DC/21HC</td>
<td>2961338 10</td>
</tr>
</tbody>
</table>
Plug-in solid-state relays suitable for PLC-INTERFACE and RIF-0, RIF-1, and PR1 relay bases.

The advantages:
- Switching capacity of up to 24 V DC/5 A
- RT III wash tight (comparable to IP67)
- Vibration- and shock-resistant
- Wear-free and long-lasting
- Zero voltage switch at AC output
- Can be soldered in on PCB

### Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>①</th>
<th>②</th>
<th>③</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to $U_n$)</td>
<td>0.8 - 1.2</td>
<td>0.8 - 1.2</td>
<td>0.8 - 1.2</td>
</tr>
<tr>
<td>Switching level</td>
<td>2.5 - 16 [V DC]</td>
<td>2.5 - 16 [V DC]</td>
<td>0.8 - 10 [V DC]</td>
</tr>
<tr>
<td>Typ. input current at $U_n$</td>
<td>9 [mA]</td>
<td>7 [mA]</td>
<td>3 [mA]</td>
</tr>
<tr>
<td>Typ. switch-on time at $U_n$</td>
<td>20 [µs]</td>
<td>20 [µs]</td>
<td>40 [µs]</td>
</tr>
<tr>
<td>Typ. switch-off time at $U_n$</td>
<td>300 [µs]</td>
<td>300 [µs]</td>
<td>500 [µs]</td>
</tr>
<tr>
<td>Transmission frequency $f_{\text{lim}}$</td>
<td>200 [Hz]</td>
<td>200 [Hz]</td>
<td>500 [Hz]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output data</th>
<th>①</th>
<th>②</th>
<th>③</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. switching voltage</td>
<td>33 V DC</td>
<td>48 V DC</td>
<td>33 V DC</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>3 V DC</td>
<td>3 V DC</td>
<td>3 V DC</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>3 A (see derating curve)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Min. load current</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Max. inrush current</td>
<td>15 A (10 ms)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Leakage current in off state</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Phase angle (cos φ)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Output circuit</td>
<td>2-conductor, floating</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Max. load value</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Output protection</td>
<td>Protection against polarity reversal, Surge protection ≤ 150 mV</td>
<td>Protection against polarity reversal, Surge protection ≤ 1 V</td>
<td></td>
</tr>
</tbody>
</table>

### General data

- Rated surge voltage
- Test voltage input/output: 2.5 kV (50 Hz, 1 min.)
- Ambient temperature (operation): -25°C ... 60°C
- Nominal operating mode: 100% operating factor
- Standards/regulations: IEC 60664, EN 50178, IEC 62103
- Pollution degree/surge voltage category: 2 / III
- Mounting position/mounting: 5 mm / 28 mm / 15 mm
- Dimensions: W / H / D

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<tbody>
<tr>
<td>OPT-5DC/24DC/60</td>
<td>2967989</td>
<td>10</td>
</tr>
<tr>
<td>OPT-24DC/24DC/60</td>
<td>2966595</td>
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<tr>
<td>OPT-60DC/24DC/60</td>
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</tr>
</tbody>
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<table>
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<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<tr>
<td>OPT-5DC/48DC/60</td>
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<tr>
<td>OPT-24DC/48DC/60</td>
<td>2966618</td>
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<tr>
<td>OPT-60DC/48DC/60</td>
<td>2966621</td>
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</tbody>
</table>
Max. DC voltage output of 5 A
Max. AC voltage output of 750 mA
Max. AC voltage output of 2 mA

Technical data

<table>
<thead>
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<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<td>OPT-24DC/24DC/5</td>
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<td>OPT-60DC/24DC/5</td>
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Ordering data

PHOENIX CONTACT | 341

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
## Relay modules

### Tables, diagrams, dimensional drawings

### Relay options for PLC basic terminal blocks

<table>
<thead>
<tr>
<th>Relay and solid-state relay options</th>
<th>Push-in connection</th>
<th>Screw connection</th>
<th>Spring-clamp connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-MR-4.5DC/21</td>
<td>2961367</td>
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<td>REL-MR-4.5DC/21AU</td>
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<td>REL-MR-12DC/21-21AU</td>
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<td>REL-MR-60DC/21HC</td>
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<td>OPT-24DC230AC/2</td>
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<td>OPT-5DC240DC/100</td>
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<td>OPT-24DC480DC/100</td>
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<td>OPT-24DC220AC/2</td>
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<tr>
<td>OPT-60DC220AC/2</td>
<td>2962184</td>
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</tbody>
</table>
Operating voltage ranges for PLC-INTERFACE, 6.2 mm versions, equipped with relay

General conditions:
Direct alignment in the block, all devices 100% operating time, horizontal or vertical mounting.

Curve A
Maximum permissible continuous voltage $U_{\text{max}}$ with limiting continuous current on the contact side (see relevant technical data).

Curve B
Minimum permissible operate voltage $U_{\text{op}}$ after pre-excitation\(^1\) (see relevant technical data).

\(^1\) Pre-excitation: relay has been operated in a thermally steady state at the ambient temperature $T_A$ with nominal voltage $U_N$ and limiting continuous current on the contact side (see relevant technical data) (warm coil). After being switched off for a short time, the relay must reliably pick up again at $U_{\text{op}}$. The $U_{\text{op}}$ values for cold coils ($T_{\text{coil}} = T_A = 20^\circ\C$) indicated by other manufacturers yield better values, but are not practical.

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Relay modules

Tables, diagrams, dimensional drawings

Plug-in miniature power relays

**REL-MR...21**

5 mm design width

Perforations for assembly: view of the connections

Pitch division: 1.25 mm and 1.27 mm

**REL-MR...21-21**

12.7 mm design width

Perforations for assembly: view of the connections

Pitch division: 2.5 mm

---

Permissible input voltage range

for REL-MR...21

Permissible input voltage range

for REL-MR...21-21, REL-MR-24DC/1IC, REL-MR...21HC

---

General conditions:

Direct alignment in the block, all devices 100% operating time, horizontal or vertical mounting.

Curve A

Maximum permissible continuous voltage \( U_{\text{max}} \) with limiting continuous current on the contact side (see relevant technical data).

Curve B

Minimum permissible operate voltage \( U_{\text{op}} \) after pre-excitation1) (see relevant technical data).

1) Pre-excitation: relay has been operated in a thermally steady state at the ambient temperature \( T_A \) with nominal voltage \( U_N \) and limiting continuous current on the contact side (see relevant technical data) (warm coil). After being switched off for a short time, the relay must reliably pick up again at \( U_{\text{op}} \). The \( U_{\text{op}} \) values for cold coils \( (T_{\text{coil}} = T_A = 20^\circ\text{C}) \) indicated by other manufacturers yield better values, but are not practical.
Plug-in solid-state relays

**OPT...DC/24DC/2**
**OPT...DC/230AC/1**
5 mm design width

Perforations for assembly: view of the connections

Pitch division: 1.25 mm and 1.27 mm

---

**OPT...DC/24DC/5**
**OPT...DC/230AC/2**
12.7 mm design width

Perforations for assembly: view of the connections

Pitch division: 2.5 mm

---

Derating curve for OPT...DC/24DC/2 and PLC-OS.../24DC/2 solid-state relays

Derating curve for OPT...DC/24DC/5 and PLC-OS.../24DC/5/ACT solid-state relays

---

Derating curve for OPT...DC/230AC/1 and PLC-OS.../230AC/1 solid-state relays

Derating curve for OPT...DC/230AC/2 and PLC-OS.../230AC/2/ACT solid-state relays

---

1. Aligned with > 10 mm spacing
2. Aligned without spacing
Relay modules

Tables, diagrams, dimensional drawings

Electrical interrupting rating for PLC-INTERFACE

Electrical interrupting rating for PLC...21 with 1 PDT relays

Switching voltage [V] vs. Switching current [A]

Switching voltage: 10, 20, 30, 50, 70, 100, 200, 300 V AC
Switching current: 0.1, 0.2, 0.3, 0.5, 1, 2, 4, 6, 10 A

Legend:
- # AC, ohmic load
- # DC, ohmic load
- # DC, ohmic load, contacts in series
- # DC, L/R = 40 ms

Electrical service life for PLC-RSP...UC/21RW

Switching current [A] vs. Cycles

Switching current: 0, 1, 2, 4, 6, 8, 10 A
Cycles: 0, 1, 2, 4, 6, 8, 10, 15, 20

Legend:
- # 250 V AC, ohmic load

Electrical interrupting rating for PLC...21-21 with 2 PDT relays

Switching voltage [V] vs. Switching current [A]

Switching voltage: 10, 20, 30, 50, 70, 100, 200, 300 V AC
Switching current: 0.1, 0.2, 0.3, 0.5, 1, 2, 4, 6, 10 A

Legend:
- # AC, ohmic load
- # DC, ohmic load
- # DC, ohmic load, contacts in series
- # DC, L/R = 40 ms

Electrical service life for PLC-RSP...UC/21-21/RW

Switching current [A] vs. Cycles

Switching current: 0, 1, 2, 4, 6, 8, 10 A
Cycles: 0, 1, 2, 4, 6, 8, 10, 15, 20

Legend:
- # 250 V AC, ohmic load
- # 250 V AC, ohmic load (DC coils)
- # 250 V AC, ohmic load (AC coils)

Electrical interrupting rating for PLC...1IC/ACT for high inrush currents

Switching voltage [V] vs. Switching current [A]

Switching voltage: 10, 20, 30, 50, 70, 100, 200, 300 V AC
Switching current: 0.1, 0.2, 0.3, 0.5, 1, 2, 4, 6, 10 A

Legend:
- # AC, ohmic load
- # DC, ohmic load
- # DC, L/R = 40 ms

Electrical service life for PLC-RSP...UC/21HC/RW

Switching current [A] vs. Cycles

Switching current: 0, 1, 2, 4, 6, 8, 10 A
Cycles: 0, 1, 2, 4, 6, 8, 10, 15, 20

Legend:
- # 250 V AC, ohmic load (DC coils)
- # 250 V AC, ohmic load (AC coils)

Electrical interrupting rating for PLC...21HC for high continuous currents

Switching voltage [V] vs. Switching current [A]

Switching voltage: 10, 20, 30, 50, 70, 100, 200, 300 V AC
Switching current: 0.1, 0.2, 0.3, 0.5, 1, 2, 4, 6, 10 A

Legend:
- # AC, ohmic load
- # DC, ohmic load
- # DC, L/R = 40 ms

Electrical service life for PLC-RSP...UC/21HC/RW

Switching current [A] vs. Cycles

Switching current: 0, 1, 2, 4, 6, 8, 10 A
Cycles: 0, 1, 2, 4, 6, 8, 10, 15, 20

Legend:
- # 250 V AC, ohmic load (DC coils)
- # 250 V AC, ohmic load (AC coils)
EMG-OV solid-state power relays

State diagram

Operating state | Switching level input | Light indicator, yellow LED | Light indicator, red LED | Alarm contact, CONTROL
---|---|---|---|---
Not activated | L | L | L | —
Normal operation | H | H | L | —
Overload/short circuit | H | H | H | —
Open circuit | L | L | H | —

Time-current characteristic, 1 A version

Time-current characteristic, 4 A version

Table of adjustable output pulse lengths

DIP switches\(^1\) | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8
---|---|---|---|---|---|---|---|---
10 & - & - & - & - & - & - & -
20 & - & - & - & - & - & - & -
50 & - & - & - & - & - & - & -
100 & - & - & - & - & - & - & -
200 & - & - & - & - & - & - & -
500 & - & - & - & - & - & - & -
1000 & - & - & - & - & - & - & -
1500 & - & - & - & - & - & - & -

\(^1\) If no switch is actuated, the output voltage is not defined.

Intermediate values can be obtained by combining several DIP switches according to the following formula:

\[ T_{\text{tot}} = \sum_{i=1}^{n} t_i \]

For additional information, visit www.phoenixcontact.net/products
Relay modules

PLC series

PLC-INTERFACE with two integrated relays

Relay module with two permanently soldered-in power relays

The advantages:
- 100% more channel density than the conventional 6.2 mm relay
- Two switching channels in a 6.2 mm housing
- Integrated input circuit/protective circuit
- Safe isolation according to DIN EN 50178 between coil and contacts and between contacts
- Screw, spring-cage, and push-in technology

Input data

<table>
<thead>
<tr>
<th>Typ. input current at $U_n$ [mA]</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response/release time at $U_n$ [ms]</td>
<td>4 / 6</td>
</tr>
</tbody>
</table>

Input circuit DC

Output data

<table>
<thead>
<tr>
<th>Contact material</th>
<th>AgNi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. switching voltage</td>
<td>250 V AC/DC</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>24 V AC/DC</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>3.5 A</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>5 mA</td>
</tr>
</tbody>
</table>

General data

| Test voltage input/output | 3 kV AC (50 Hz, 1 min.) |
| Test voltage output/output | 3 kV AC (50 Hz, 1 min.) |
| Ambient temperature (operation) | -20°C ... 60°C |
| Mechanical service life | 2 x $10^7$ cycles |
| Standards/regulations | IEC 60664, EN 50178, IEC 62103 |
| Connection data solid / stranded / AWG | 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 |

Dimensions: W / H / D 6.2 mm / 80 mm / 86 mm

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td>24 V DC</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td>24 V DC</td>
</tr>
<tr>
<td>PLC-INTERFACE, with push-in connection</td>
<td>24 V DC</td>
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</tbody>
</table>

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<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<tr>
<td>PLC-2RSP-24DC/1</td>
<td>2987312</td>
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<tr>
<td>PLC-2RPRT-24DC/1</td>
<td>2901639</td>
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</table>

Notes:

Type of housing:
Polyamide PA non-reinforced, color: green.

Marking systems and mounting material
See Catalog 5

1) EMC: Class A product, see page 571

Technical data

Two integrated relays

Relay module with two permanently soldered-in power relays

The advantages:
- 100% more channel density than the conventional 6.2 mm relay
- Two switching channels in a 6.2 mm housing
- Integrated input circuit/protective circuit
- Safe isolation according to DIN EN 50178 between coil and contacts and between contacts
- Screw, spring-cage, and push-in technology

Input data

<table>
<thead>
<tr>
<th>Typ. input current at $U_n$ [mA]</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>Response/release time at $U_n$ [ms]</td>
<td>4 / 6</td>
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</table>

Input circuit DC

Output data

<table>
<thead>
<tr>
<th>Contact material</th>
<th>AgNi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. switching voltage</td>
<td>250 V AC/DC</td>
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<tr>
<td>Min. switching voltage</td>
<td>24 V AC/DC</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>3.5 A</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>5 mA</td>
</tr>
</tbody>
</table>

General data

| Test voltage input/output | 3 kV AC (50 Hz, 1 min.) |
| Test voltage output/output | 3 kV AC (50 Hz, 1 min.) |
| Ambient temperature (operation) | -20°C ... 60°C |
| Mechanical service life | 2 x $10^7$ cycles |
| Standards/regulations | IEC 60664, EN 50178, IEC 62103 |
| Connection data solid / stranded / AWG | 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14 |

Dimensions: W / H / D 6.2 mm / 80 mm / 86 mm

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td>24 V DC</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td>24 V DC</td>
</tr>
<tr>
<td>PLC-INTERFACE, with push-in connection</td>
<td>24 V DC</td>
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<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<tbody>
<tr>
<td>PLC-2RSC-24DC/1</td>
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<tr>
<td>PLC-2RSP-24DC/1</td>
<td>2987312</td>
<td>10</td>
</tr>
<tr>
<td>PLC-2RPRT-24DC/1</td>
<td>2901639</td>
<td>10</td>
</tr>
</tbody>
</table>

Notes:

Type of housing:
Polyamide PA non-reinforced, color: green.

Marking systems and mounting material
See Catalog 5

1) EMC: Class A product, see page 571

Technical data

Two integrated relays

Relay module with two permanently soldered-in power relays

The advantages:
- 100% more channel density than the conventional 6.2 mm relay
- Two switching channels in a 6.2 mm housing
- Integrated input circuit/protective circuit
- Safe isolation according to DIN EN 50178 between coil and contacts and between contacts
- Screw, spring-cage, and push-in technology
Application example for PLC-2RS...24DC/1

Operating voltage range

Interruption rating

DC, ohmic load
Relay modules

PLC series

PLC-INTERFACE with manual switch and relay

Relay module with manual switch and integrated power relay for manual, zero, and automatic functions

The advantages are:
- Max. switching current of 6 A
- Only 6.2 mm wide
- Floating confirmation contact
- Safe isolation according to DIN EN 50178 between coil and contact
- Screw, spring-cage, and push-in technology

Notes:
- Type of housing: Polyester PBT non-reinforced, color: green.
- Marking systems and mounting material: See Catalog 5
- For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
- Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.
- Module height: PLC...-S/H = 90 mm; PLC...-S/L = 86 mm

Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Typ. input current at UN</td>
<td>mA</td>
</tr>
<tr>
<td>Response/release time at UN</td>
<td>ms</td>
</tr>
<tr>
<td>Input circuit</td>
<td>AC/DC</td>
</tr>
</tbody>
</table>

Output data

| Contact material |   |
| Max. switching voltage |   |
| Min. switching voltage |   |
| Limiting continuous current |   |
| Max. inrush current | mA |
| Min. switching current | mA |

Feedback

Operating mode "Automatic" floating

General data

| Rated insulation voltage | V AC |
| Rated surge voltage | kV |
| Ambient temperature (operation) | °C |
| Standards/regulations |   |
| Pollution degree/surge voltage category |   |

Dimensions

| W / H / D |   |

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage</th>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td>24 V DC/AC</td>
<td>PLC-RSC-24UC/1/S/H</td>
<td>2982236</td>
<td>10</td>
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<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td>24 V DC/AC</td>
<td>PLC-RSC-24UC/1/S/L</td>
<td>2834876</td>
<td>10</td>
</tr>
<tr>
<td>PLC INTERFACE, with push-in connection</td>
<td>24 V DC/AC</td>
<td>PLC-RPT-24UC/1/S/H</td>
<td>2982249</td>
<td>10</td>
</tr>
<tr>
<td>PLC INTERFACE, with push-in connection</td>
<td>24 V DC/AC</td>
<td>PLC-RPT-24UC/1/S/L</td>
<td>2834889</td>
<td>10</td>
</tr>
</tbody>
</table>

Notes:
- Type of housing: Polyester PBT non-reinforced, color: green.
- Marking systems and mounting material: See Catalog 5
- For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
- Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.
- Module height: PLC...-S/H = 90 mm; PLC...-S/L = 86 mm

Permissible input voltage range for PLC-RS...24UC/1/S...

Curve A maximum continuous voltage at limiting continuous current = 6 A

Curve B minimum operating voltage for pre-activation with UN and limiting continuous current = 6 A

Relay module with manual switch and integrated relay
PLC-INTERFACE with manual switch without relay

Switching module without relay for manual, zero, and automatic functions

The advantages:
- Only 6.2 mm wide
- Floating confirmation contact
- Screw and spring-cage connection technology

Summary:
- Type of housing: Polyester PBT non-reinforced, color: green.
- Marking systems and mounting material: See Catalog 5.
- For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
- Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.
- Module height: PLC-...-S/H = 90 mm; PLC-...-S/L = 86 mm
- PLC-...H - manual operation
- PLC-...L - operation using screwdriver

### Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. switching voltage</td>
<td>72 V DC</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>2 V DC</td>
</tr>
<tr>
<td>Max. inrush current</td>
<td>50 mA</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>1 mA</td>
</tr>
<tr>
<td>Cycles, max.</td>
<td>100 (at 72 V DC / 50 mA) / 10000 (at 12 V DC / 100 mA)</td>
</tr>
<tr>
<td>Feedback</td>
<td>≤ 72 V DC / 50 mA</td>
</tr>
<tr>
<td>Operating mode &quot;Automatic&quot; floating</td>
<td></td>
</tr>
<tr>
<td>Rated insulation voltage</td>
<td>85 V AC</td>
</tr>
<tr>
<td>Rated surge voltage</td>
<td>0.5 kV / basic insulation</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-20°C ... 60°C</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>IEC 60664, EN 50178, IEC 62103</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category</td>
<td>2 / III</td>
</tr>
<tr>
<td>Dimensions</td>
<td>W / H / D</td>
</tr>
<tr>
<td></td>
<td>6.2 mm / 80 mm / 90 mm</td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pcs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td>PLC-SC-S/H</td>
<td>2980733</td>
<td>10</td>
</tr>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td>PLC-SC-S/L</td>
<td>2980775</td>
<td>10</td>
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<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td>PLC-SP-S/H</td>
<td>2980746</td>
<td>10</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td>PLC-SP-S/L</td>
<td>2980788</td>
<td>10</td>
</tr>
</tbody>
</table>

Application example PLC-S...S...

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
Relay modules

PLC series

**PLC-INTERFACE with an integrated solid-state relay**

The slim 6.2 mm PLC housing with integrated electronics in various versions offers the following advantages:

- Option of bridging adjacent modules
- Status display
- Protection circuits in input and output
- Wear-resistant and bounce-free switching
- Integrated protection circuit
- DC outputs of up to 300 V DC/1 A or up to 24 V DC/10 A
- Electronic PDT output of up to 48 V DC/500 mA
- Screw, spring-cage, and push-in technology

**Technical data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_h$</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td>5 V DC</td>
</tr>
<tr>
<td>①</td>
<td>②</td>
</tr>
<tr>
<td>PLC-OSC- 5DC/300DC/ 11'</td>
<td>2980652</td>
</tr>
<tr>
<td>PLC-OSC- 12DC/300DC/ 11'</td>
<td>2980665</td>
</tr>
<tr>
<td>PLC-OSC- 24DC/300DC/ 11'</td>
<td>2980678</td>
</tr>
<tr>
<td>PLC-OSC- 60DC/300DC/ 11'</td>
<td>2980681</td>
</tr>
<tr>
<td>PLC-OSC- 110DC/300DC/ 11'</td>
<td>2980694</td>
</tr>
<tr>
<td>PLC-OSC- 220DC/300DC/ 11'</td>
<td>2980704</td>
</tr>
<tr>
<td>PLC-OSC- 120AC/300DC/ 11'</td>
<td>2980717</td>
</tr>
<tr>
<td>PLC-OSC-230AC/300DC/ 11'</td>
<td>2980720</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td>5 V DC</td>
</tr>
<tr>
<td>①</td>
<td>②</td>
</tr>
<tr>
<td>PLC-OSP- 5DC/300DC/ 11'</td>
<td>2980814</td>
</tr>
<tr>
<td>PLC-OSP- 12DC/300DC/ 11'</td>
<td>2980827</td>
</tr>
<tr>
<td>PLC-OSP- 24DC/300DC/ 11'</td>
<td>2980830</td>
</tr>
<tr>
<td>PLC-OSP- 60DC/300DC/ 11'</td>
<td>2980843</td>
</tr>
<tr>
<td>PLC-OSP-110DC/300DC/ 11'</td>
<td>2980856</td>
</tr>
<tr>
<td>PLC-OSP-220DC/300DC/ 11'</td>
<td>2980869</td>
</tr>
<tr>
<td>PLC-OSP-120AC/300DC/ 11'</td>
<td>2980872</td>
</tr>
<tr>
<td>PLC-OSP-230AC/300DC/ 11'</td>
<td>2980885</td>
</tr>
<tr>
<td>PLC-INTERFACE, with push-in connection</td>
<td>5 V DC</td>
</tr>
<tr>
<td>①</td>
<td>②</td>
</tr>
<tr>
<td>PLC-OPT- 5DC/300DC/ 11'</td>
<td>2980381</td>
</tr>
<tr>
<td>PLC-OPT- 12DC/300DC/ 11'</td>
<td>2980382</td>
</tr>
<tr>
<td>PLC-OPT- 24DC/300DC/ 11'</td>
<td>2980383</td>
</tr>
<tr>
<td>PLC-OPT- 60DC/300DC/ 11'</td>
<td>2980384</td>
</tr>
<tr>
<td>PLC-OPT-110DC/300DC/ 11'</td>
<td>2980385</td>
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<td>PLC-OPT-220DC/300DC/ 11'</td>
<td>2980387</td>
</tr>
<tr>
<td>PLC-OPT-120AC/300DC/ 11'</td>
<td>2980388</td>
</tr>
<tr>
<td>PLC-OPT-230AC/300DC/ 11'</td>
<td>2980389</td>
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</table>

**Ordering data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_h$</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE, with screw connection</td>
<td>5 V DC</td>
</tr>
<tr>
<td>①</td>
<td>②</td>
</tr>
<tr>
<td>PLC-OSC- 5DC/300DC/ 11'</td>
<td>2980652</td>
</tr>
<tr>
<td>PLC-OSC- 12DC/300DC/ 11'</td>
<td>2980665</td>
</tr>
<tr>
<td>PLC-OSC- 24DC/300DC/ 11'</td>
<td>2980678</td>
</tr>
<tr>
<td>PLC-OSC- 60DC/300DC/ 11'</td>
<td>2980681</td>
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<tr>
<td>PLC-OSC-110DC/300DC/ 11'</td>
<td>2980694</td>
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<tr>
<td>PLC-OSC-220DC/300DC/ 11'</td>
<td>2980704</td>
</tr>
<tr>
<td>PLC-OSC-120AC/300DC/ 11'</td>
<td>2980717</td>
</tr>
<tr>
<td>PLC-OSC-230AC/300DC/ 11'</td>
<td>2980720</td>
</tr>
<tr>
<td>PLC INTERFACE, with spring-cage connection</td>
<td>5 V DC</td>
</tr>
<tr>
<td>①</td>
<td>②</td>
</tr>
<tr>
<td>PLC-OSP- 5DC/300DC/ 11'</td>
<td>2980814</td>
</tr>
<tr>
<td>PLC-OSP- 12DC/300DC/ 11'</td>
<td>2980827</td>
</tr>
<tr>
<td>PLC-OSP- 24DC/300DC/ 11'</td>
<td>2980830</td>
</tr>
<tr>
<td>PLC-OSP- 60DC/300DC/ 11'</td>
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</tr>
<tr>
<td>PLC-OSP-110DC/300DC/ 11'</td>
<td>2980856</td>
</tr>
<tr>
<td>PLC-OSP-220DC/300DC/ 11'</td>
<td>2980869</td>
</tr>
<tr>
<td>PLC-OSP-120AC/300DC/ 11'</td>
<td>2980872</td>
</tr>
<tr>
<td>PLC-OSP-230AC/300DC/ 11'</td>
<td>2980885</td>
</tr>
<tr>
<td>PLC-INTERFACE, with push-in connection</td>
<td>5 V DC</td>
</tr>
<tr>
<td>①</td>
<td>②</td>
</tr>
<tr>
<td>PLC-OPT- 5DC/300DC/ 11'</td>
<td>2980381</td>
</tr>
<tr>
<td>PLC-OPT- 12DC/300DC/ 11'</td>
<td>2980382</td>
</tr>
<tr>
<td>PLC-OPT- 24DC/300DC/ 11'</td>
<td>2980383</td>
</tr>
<tr>
<td>PLC-OPT- 60DC/300DC/ 11'</td>
<td>2980384</td>
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<tr>
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<td>2980387</td>
</tr>
<tr>
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<td>2980388</td>
</tr>
<tr>
<td>PLC-OPT-230AC/300DC/ 11'</td>
<td>2980389</td>
</tr>
</tbody>
</table>
## Relay modules
### PLC series

**Power solid-state relay with short-circuit-proof DC voltage output, max. 10 A, with feedback**

**Input solid-state relay with DC voltage output, max. 500 mA, with electronic PDT**

### Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature [°C]</td>
<td>-25</td>
<td>60</td>
</tr>
<tr>
<td>Load current [A]</td>
<td>0.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Load current [mA]</td>
<td>0.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Load current [mA]</td>
<td>3</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltage</th>
<th>3 V DC ... 33 V DC (High active) / 100 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>33 V DC / 5 V DC</td>
</tr>
<tr>
<td>Load current [mA]</td>
<td>10 A (see derating curve) / 50 mA</td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-OSC- 24DC/ 24DC/ 10/R</td>
<td>2982702</td>
<td>10</td>
</tr>
<tr>
<td>PLC-OSP- 24DC/ 24DC/ 10/R</td>
<td>2982715</td>
<td>10</td>
</tr>
<tr>
<td>PLC-OPT- 24DC/ 24DC/10/R</td>
<td>2900398</td>
<td>10</td>
</tr>
<tr>
<td>PLC-OSC- 24DC/ 48DC/500/W</td>
<td>2982715</td>
<td>10</td>
</tr>
<tr>
<td>PLC-OSP- 24DC/ 48DC/500/W</td>
<td>2982715</td>
<td>10</td>
</tr>
<tr>
<td>PLC-OPT- 24DC/ 48DC/500/W</td>
<td>2900398</td>
<td>10</td>
</tr>
</tbody>
</table>

### Derating curves

- **For input voltages 220 V DC and 230 V AC**
- **For input voltages 220 V DC and 230 V AC**
- **For input voltages 220 V DC and 230 V AC**
### Relay modules

**PLC series**

#### PLC-INTERFACE

Solid-state relays up to 100 kHz

A solid-state relay for the safe acquisition of short pulses.

- Status display
- Bridging options
- Limit frequency of up to 100 kHz
- Push-pull stage on output side
- Features a capacitor on the input side for interference suppression

#### Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to ( U_{n} ))</td>
<td>0.8 - 1.2</td>
</tr>
<tr>
<td>Switching level with reference to ( U_{n} )</td>
<td>1 signal (&quot;H&quot;) &gt; 0.8, 0 signal (&quot;L&quot;) &lt; 0.4</td>
</tr>
<tr>
<td>Typ. input current at ( U_{n} ) [mA]</td>
<td>7, 6</td>
</tr>
<tr>
<td>Typ. switch-on time at ( U_{n} ) [µs]</td>
<td>1.5, 1.5</td>
</tr>
<tr>
<td>Typ. switch-off time at ( U_{n} ) [µs]</td>
<td>2, 2</td>
</tr>
<tr>
<td>Transmission frequency ( f_{\text{limit}} ) [kHz]</td>
<td>100, 100</td>
</tr>
<tr>
<td>Input protection:</td>
<td>LED yellow, Protection against polarity reversal, Surge protection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage range</td>
<td>4 V DC ... 30 V DC</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>50 mA</td>
</tr>
<tr>
<td>Quiescent current</td>
<td>4.3 mA</td>
</tr>
<tr>
<td>Residual voltage drop at ( &quot;H&quot; )</td>
<td>&lt; 0.5 V</td>
</tr>
<tr>
<td>Output circuit</td>
<td>3-conductor, ground-referenced</td>
</tr>
<tr>
<td>Output protection</td>
<td>Protection against polarity reversal, Surge protection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Test voltage input/output</td>
<td>2,5 kV, ( f_{n} ), (50 Hz, 1 min.)</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-20°C ... 60°C</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>DIN EN 50178</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category</td>
<td>2 / II</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14</td>
</tr>
<tr>
<td>Dimensions W / H / D</td>
<td>6.2 mm / 80 mm / 86 mm</td>
</tr>
</tbody>
</table>

#### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage ( U_{n} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input solid-state relay with push-in connection</td>
<td>5 V DC, 24 V DC</td>
</tr>
<tr>
<td>Input solid-state relay with screw connection</td>
<td>5 V DC, 24 V DC</td>
</tr>
</tbody>
</table>

### Notes:

- Type of housing: Polyamide PA non-reinforced, color: green.
- Marking systems and mounting material:
  - See Catalog 5

1) EMC: Class A product, see page 571
### Technical data

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0.5</td>
<td>0.8</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>&gt; 0.5</td>
<td>&gt; 0.8</td>
<td>&gt; 0.5</td>
<td>&gt; 0.8</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>&lt; 0.3</td>
<td>&lt; 0.4</td>
<td>&lt; 0.3</td>
<td>&lt; 0.4</td>
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<tr>
<td>4</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>7</td>
<td>7</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

- LED yellow, Protection against polarity reversal, Surge protection

#### Input protection:
- LED yellow
- Protection against polarity reversal
- Surge protection

#### Output protection:
- LED yellow
- Protection against polarity reversal
- Surge protection

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-OSC- 5DC/ 5DC/100KHZ-G1</td>
<td>2902965</td>
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<tr>
<td>PLC-OSC- 24DC/ 5DC/100KHZ-G1</td>
<td>2902966</td>
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<td>PLC-OSC- 24DC/ 24DC/100KHZ-G1</td>
<td>2902967</td>
<td>1</td>
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<tr>
<td>PLC-OPT- 5DC/ 5DC/100KHZ-G1</td>
<td>2902971</td>
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<td>2902973</td>
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</tr>
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### Connection data

- Solid / stranded / AWG 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
- 26 - 14 mm² / 26 - 14 mm² / 26 - 14

### Dimensions

- W / H / D: 6.2 mm / 80 mm / 86 mm
- 6.2 mm / 80 mm / 86 mm
- 6.2 mm / 80 mm / 86 mm

- DIN EN 50178
- 2 / II

### Other Information

- Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT

Relay modules

PLC series

with DC voltage output push-pull
Transmission frequency 100 kHz

with DC voltage output push-pull
Transmission frequency 100 kHz

For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT | 355

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
**PLC INTERFACE for the TTL signal at the input**

The PLC-BS...TTL/1 basic terminal block is controlled using a TTL (5 V) input signal and can be equipped with a mechanical relay or a solid-state relay as an option. The basic terminal block equipped with a robust miniature relay offers the following advantages:

- 6.2 mm slim design width
- Bridging options
- Status display
- Screw and spring-cage connection
- RTIII degree of protection
- Safe isolation in accordance with EN 50178 (VDE 0160)
- \(4 \text{ kV}_{\text{rms}}\) electrical isolation between coil and contact.
- Screw, spring-cage, and push-in technology

### Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated control supply voltage (U_{\text{IN}})</td>
<td>5 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated control supply voltage range with reference to (U_{\text{IN}})</td>
<td>0.9 ... 1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated control supply current (I_{\text{IN}})</td>
<td>41 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated actuating voltage (U_{\text{C}}) (IN)</td>
<td>5 V DC (TTL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated actuating voltage range with reference to (U_{\text{C}})</td>
<td>0.9 ... 1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated actuating current (I_{\text{C}})</td>
<td>2.5 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typ. response time at (U_{\text{C}})</td>
<td>4.5 ms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typ. release time for (U_{\text{C}})</td>
<td>3.5 ms</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Input circuit: Yellow LED, Protection against polarity reversal, Surge protection

### Output data with: REL-MR-4,5DC/21AU REL-MR-4,5DC/21

<table>
<thead>
<tr>
<th>Contact type</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact material</td>
<td>AgSnO, hard gold-plated</td>
<td>AgSnO</td>
<td></td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>30 V AC / 36 V DC</td>
<td>250 V AC/DC</td>
<td></td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>100 mV (at 10 mA)</td>
<td>5 V (at 100 mA)</td>
<td></td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>50 mA</td>
<td>6 A</td>
<td></td>
</tr>
<tr>
<td>Max. inrush current</td>
<td>50 mA</td>
<td>(on request)</td>
<td></td>
</tr>
<tr>
<td>Min. switching current</td>
<td>1 mA (at 24 V)</td>
<td>10 mA (at 12 V)</td>
<td></td>
</tr>
</tbody>
</table>

### General data

| Rated insulation voltage | 250 V         |              |              |
| Rated surge voltage / insulation | 6 kV |              |              |
| Ambient temperature (operation) | -20°C ... 60°C |              |              |
| Mechanical service life | 2 x 10^6 cycles |              |              |
| Air and creepage distances between the power circuits | IEC 60954, EN 50178, IEC 62103 |              |              |

### Dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>W / H / D</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Air and creepage distances between the power circuits</td>
<td>2 / III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting position / Assembly</td>
<td>Any / In rows with zero spacing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. interrupting rating</td>
<td>6.2 mm / 80 mm / 94 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

- Type of housing: Polyester PBT non-reinforced, color: green.
- Marking systems and mounting material
- See Catalog 5
- 1) EMC: Class A product, see page 571

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC INTERFACE</td>
<td>PLC-BS-TTL/1(1)</td>
<td>2982689</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>PLC-BSP-TTL/1(1)</td>
<td>2982692</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>PLC-BPT-TTL/1(1)</td>
<td>2900458</td>
<td>10</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-MR 4,5DC/21AU</td>
<td>2961370</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-4,5DC/21</td>
<td>2961367</td>
<td>10</td>
</tr>
</tbody>
</table>
PLC-INTERFACE for the TTL signal at the input

The PLC-BS...TTL/1 basic terminal block is controlled using a TTL (5 V) input signal and can be equipped with a mechanical relay or a solid-state relay as an option. The basic terminal block equipped with a solid-state relay offers the following advantages:
- 6.2 mm slim design width
- Bridging options
- Status display
- Screw and spring-cage connection
- IP67-protected solid-state relay electronic unit
- Switching capacity of up to 24 V DC/3 A
- Alternative input or power solid-state relay
- Wear-free and output-free
- Integrated protection circuit
- Insensitive to vibrations and shocks
- 2.5 kV<sub>imin</sub> electrical isolation between input and output
- Screw, spring-cage, and push-in technology

---

Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated control supply voltage U&lt;sub&gt;IN&lt;/sub&gt;</td>
<td>5 V DC</td>
</tr>
<tr>
<td>Rated control supply voltage range with reference to U&lt;sub&gt;IN&lt;/sub&gt;</td>
<td>0.9 ... 1.2</td>
</tr>
<tr>
<td>Rated control supply current I&lt;sub&gt;IN&lt;/sub&gt;</td>
<td>11.5 mA</td>
</tr>
<tr>
<td>Rated actuating voltage U&lt;sub&gt;C&lt;/sub&gt; (IN)</td>
<td>5 V DC (TTL)</td>
</tr>
<tr>
<td>Switching level 1 signal (&quot;H&quot;) (TTL signal)</td>
<td>&gt; 2 V DC</td>
</tr>
<tr>
<td>Switching level 0 signal (&quot;L&quot;) (TTL signal)</td>
<td>&lt; 0.8 V DC</td>
</tr>
<tr>
<td>Rated actuating current I&lt;sub&gt;C&lt;/sub&gt;</td>
<td>2.5 mA</td>
</tr>
<tr>
<td>Typ. response time/switch-on time at U&lt;sub&gt;C&lt;/sub&gt;</td>
<td>35 µs</td>
</tr>
<tr>
<td>Typ. switch-off time at U&lt;sub&gt;C&lt;/sub&gt;</td>
<td>320 µs</td>
</tr>
</tbody>
</table>

Input circuit

Output data with:
- Max. switching voltage
- Min. switching voltage
- Limiting continuous current
- Output protection

Voltage drop at limiting continuous current

General data

Rated insulation voltage

Rated surge voltage / insulation

Ambient temperature (operation)

Air and creepage distances between the power circuits

Pollution degree / Surge voltage category

Connection data solid / stranded / AWG

Dimensions W / H / D

---

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type Order No. Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-INTERFACE</td>
<td></td>
</tr>
<tr>
<td>With screw connection</td>
<td>PLC-BSG-TTL/1) 2982689 10</td>
</tr>
<tr>
<td>With spring-cage connection</td>
<td>PLC-BSF-TTL/1) 2982692 10</td>
</tr>
<tr>
<td>With push-in connection</td>
<td>PLC-BPT-TTL/1) 2900458 10</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type Order No. Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid-state input relays</td>
<td>OPT- 5DC/48DC/100 2967992 10</td>
</tr>
<tr>
<td>Solid-state power relays</td>
<td>OPT- 5DC/24DC/2 2967989 10</td>
</tr>
</tbody>
</table>

---

Notes:
- Type of housing: Polyester PBT non-reinforced, color: green.
- Marking systems and mounting material
- For derating curves see page 345
- 1) EMC: Class A product, see page 571

PLC-INTERFACE for the TTL signal at the input

Basic terminal block for fitting with solid-state relay for TTL (5 V)
Relay modules

PLC series

PLC-INTERFACE for the TTL signal at the output

The PLC-OS...24DC/TTL with a built-in solid-state relay can be used for fast and wear-free switching of TTL (5 V) signals. The module offers the following advantages:
- Switching capacity TTL (5 V), fan out = 1
- 6.2 mm slim design width
- Bridging options
- Status display
- Screw and spring-cage connection
- Integrated protection circuit
- Insensitive to vibrations and shocks
- Screw, spring-cage, and push-in technology

Technical data

Input data
- Rated actuating voltage \( U_{C} \)
- Rated actuating voltage range with reference to \( U_{C} \) 0.8 ... 1.2
- Switching level 1 signal (“H”) > 0.8
- Switching level 0 signal (“L”) < 0.4
- Rated actuating current \( I_{C} \)
- Typ. switch-on time for \( U_{C} \) 35 µs
- Typ. switch-off time at \( U_{C} \) 35 µs
- Transmission frequency \( f_{\text{limit}} \) 1 kHz
- Input circuit DC

Output data with:
- Rated control supply voltage \( U_{S} \)
- Rated control supply voltage range with reference to \( U_{S} \) 0.9 ... 1.2
- Limiting continuous current
- Output protection
- Voltage drop at max. limiting continuous current

General data
- Rated insulation voltage 250 V DC
- Rated surge voltage / insulation 4 kV / basic insulation
- Ambient temperature (operation) \(-25°C \ldots 60°C\)
- Air and creepage distances between the power circuits \( \text{IEC 60664, EN 50178, IEC 62103} \)
- Pollution degree/surge voltage category \( 2 / \text{III} \)
- Connection data solid / stranded / AWG
- Dimensions \( W / H / D \)

Input solid state relay with TTL (5 V) output

Notes:
- Type of housing: Polyester PBT non-reinforced, color: green.
- Marking systems and mounting material See Catalog 5
- 1) EMC: Class A product, see page 571

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-INTERFACE</td>
<td>PLC-OSC- 24DC/TTL</td>
<td>2982728</td>
<td>10</td>
</tr>
<tr>
<td>With screw connection</td>
<td>PLC-OSP- 24DC/TTL1)</td>
<td>2982731</td>
<td>10</td>
</tr>
<tr>
<td>With spring-cage connection</td>
<td>PLC-OPT- 24DC/TTL</td>
<td>2900363</td>
<td>10</td>
</tr>
</tbody>
</table>

Derating curve for PLC-OSP...24DC/3RW

- Aligned without spacing
- Aligned with ≥ 20 mm spacing

Derating curve for PLC-OSP...110DC/3RW

- Aligned without spacing
- Aligned with ≥ 20 mm spacing

Image courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
PLC-INTERFACE with solid-state relays for railway applications

The PLC-OSP...RW interface modules are intended for use as per DIN EN 50155 (VDE 0115 part 200) “Railway applications, Part 200: Electronic devices in rail vehicles”.

The advantages:
- Temperature range -25°C to +70°C
- Input voltage range 0.7 - 1.25 x \( U_{in} \)
- Shock resistance according to DIN 50155 (requirements according to EN 61373).
- Screw, spring-cage, and push-in technology

Input data
- Permissible range (with reference to \( U_{in} \))
- Switching level (with reference to \( U_{in} \))
- Typ. input current at \( U_{in} \)
- Typ. switch-on time at \( U_{in} \)
- Typ. switch-off time at \( U_{in} \)
- Transmission frequency \( f_{trans} \)
- Input circuit DC

Output data
- Max. switching voltage
- Min. switching voltage
- Limiting continuous current
- Voltage drop at max. limiting continuous current
- Rated insulation voltage
- Rated surge voltage
- Ambient temperature (operation)
- Standards/regulations
- Pollution degree/surge voltage category
- Connection data solid / stranded / AWG
- Dimensions

Technical data
- Input data
- Output data
- General data

Notes:
- Type of housing: Polyester PBT non-reinforced, color: green.
- Marking systems and mounting material: See Catalog 5
- For derating curves see page 358
- 1) EMC: Class A product, see page 571

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-INTERFACE, with spring-cage connection</td>
<td>24 V DC</td>
<td>PLC-OSP- 24DC/ 24DC/ 3RW</td>
<td>2980513</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>36 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>48 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>72 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>96 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>110 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLC-INTERFACE, with push-in connection</td>
<td>24 V DC</td>
<td>PLC-OSP-110DC/ 24DC/ 3RW</td>
<td>2980526</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>36 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>48 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>72 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>96 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>110 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PLC-INTERFACE for railway applications

Relay modules with extended input voltage and temperature range, specifically for use in railway applications

The advantages:
- Temperature range -25°C to +70°C
- Input voltage range 0.7 to 1.25 x UN
- Vibration and shock resistance to EN 50155
- Safe isolation according to DIN EN 50178 between coil and contact
- Spring cage and push-in connection method

Permissible input voltage range for PLC-BSP-24DC/21RW (with REL-MR-18DC/21... relay)

Input data
- Nominal input voltage \( U_n \)
- Permissible range (with reference to \( U_n \))
- Typ. input current at \( U_n \)
- Typ. response time at \( U_n \)
- Typ. release time at \( U_n \)
- Input circuit

Output data with:
- Contact type
- Contact material
- Max. switching voltage
- Min. switching voltage
- Limiting continuous current
- Max. inrush current
- Min. switching current

General data
- Test voltage input/output
- Ambient temperature (operation)
- Mechanical service life
- Standards/regulations
- Pollution degree / Surge voltage category
- Connection data solid / stranded / AWG
- Dimensions

Technical data

Ordering data

Accessories

PLC-BP-24DC/21RW
PLC-BP-24DC/21AU

REL-MR-18DC/21
REL-MR-18DC/21AU

Notes:
- Type of housing: Polyamide PA non-reinforced, color: green.
- Marking systems and mounting material
- See Catalog 5
- 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...
- If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

1) EMC: Class A product, see page 571
PLC-INTERFACE for railway applications

Relay module for input voltages with a nominal frequency of 16.7 Hz

The advantages:
- Input nominal frequency 16.7 Hz
- Vibration and shock resistance to EN 50155
- Safe isolation according to DIN EN 50178 between coil and contact
- Spring cage and push-in connection method

Notes:
Type of housing:
Polyamide PA non-reinforced, color: green.
Marking systems and mounting material
See Catalog 5
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...
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The values in parentheses then apply for further operation. This can result in a shorter service life than with a pure power contact.
1) EMC: Class A product, see page 571

For additional information, visit www.phoenixcontact.net/products

For 16.7 Hz input frequency with 2 PDTs

Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>Output data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal input voltage U_{NI}</td>
<td>Contact type: Single contact, 2-PDT</td>
</tr>
<tr>
<td>Input nominal frequency 16.67 Hz</td>
<td>Contact material: AgNi, hard gold-plated</td>
</tr>
<tr>
<td>Permissible range (with reference to U_{NI})</td>
<td>Max. switching voltage 30 V AC / 36 V DC ( (250 \text{ V AC/DC} )</td>
</tr>
<tr>
<td>Typ. input current at U_{NI}</td>
<td>Min. switching voltage 100 mA ( (5 \text{ V AC/DC} )</td>
</tr>
<tr>
<td>Typ. response time at U_{NI}</td>
<td>Limiting continuous current 50 mA ( (6 \text{ A} )</td>
</tr>
<tr>
<td>Typ. release time at U_{NI}</td>
<td>Max. inrush current 50 mA ( (8 \text{ A} )</td>
</tr>
<tr>
<td>Input circuit Yellow LED, Bridge rectifier</td>
<td>Min. switching current 1 mA ( (10 \text{ mA} )</td>
</tr>
</tbody>
</table>

General data
Test voltage input/output 6 kV
Ambient temperature (operation) \(-25°C \ldots 60°C\)
Mechanical service life Approx. 3 x 10^7 cycles
Standards/regulations IEC 60664, EN 50178, IEC 62103
Pollution degree / Surge voltage category 2 / III
Connection data solid / stranded / AWG 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions W / H / D 14 mm / 80 mm / 94 mm

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Voltage U_{NI}</th>
<th>Order No.</th>
<th>Pcs./Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-INTERFACE</td>
<td>230 V AC</td>
<td>2968001</td>
<td>10</td>
</tr>
<tr>
<td>With spring-cage connection</td>
<td>230 V AC</td>
<td>2900345</td>
<td>10</td>
</tr>
<tr>
<td>With push-in connection</td>
<td>230 V AC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Permissible input voltage range for PLC-RSP-230UC/21-21AU/RWF

Curve A
maximum continuous voltage at limiting continuous current = 6 A

Curve B
minimum operating voltage for pre-excitation with U_{NI} and limiting continuous current = 6 A

Ambient temperature [°C]
Curve A
maximum continuous voltage at limiting continuous current = 6 A

Curve B
minimum operating voltage for pre-excitation with U_{NI} and limiting continuous current = 6 A

Dimensions W / H / D 14 mm / 80 mm / 94 mm
Relay modules

PLC series

PLC-INTERFACE for railway applications

Relay modules with extended input voltage and temperature range, specifically designed for railway applications
The advantages:
– Certified to EN 50155
– Optimum relay operation thanks to wide-range electronics
– Temperature range from -40°C to +70°C (short-term 85°C)
– Input voltage range 0.7 to 1.25 x U_N (short-term 1.4 x U_N)
– Vibration and shock resistance to EN 50155
– Safe isolation according to DIN EN 50178 between coil and contact
– Spring cage and push-in connection method

Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>①</th>
<th>②</th>
<th>③</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to U_N)</td>
<td>0.7 - 1.25</td>
<td>0.7 - 1.25</td>
<td>0.7 - 1.25</td>
</tr>
<tr>
<td>Typ. input current at U_N [mA]</td>
<td>9</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Typ. response time at U_N [ms]</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Typ. release time at U_N [ms]</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Input protection:
Yellow LED, Bridge rectifier, freewheeling diode

<table>
<thead>
<tr>
<th>Output data</th>
<th>Single contact, 1-PDT</th>
<th>Single contact, 1-PDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact type</td>
<td>AgSnO</td>
<td>AgSnO, hard gold-plated</td>
</tr>
<tr>
<td>Contact material</td>
<td>250 V AC/DC</td>
<td>30 V AC / 36 V DC</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>5 V (at 100 mA)</td>
<td>100 mV</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>6 A</td>
<td>50 mA</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>(on request)</td>
<td>50 mA</td>
</tr>
<tr>
<td>Max. inrush current</td>
<td>10 mA (at 12 V)</td>
<td>1 mA</td>
</tr>
<tr>
<td>Min. switching current</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

General data
Test voltage (winding / contact) 4 kVrms (50 Hz, 1 min.)
Ambient temperature (operation) -40°C ... 70°C (Temperature class TX)
Mechanical service life Approx. 2 x 10^7 cycles

Connection data solid / stranded / AWG
Dimensions W / H / D
6.2 mm / 80 mm / 94 mm

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage U_N</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-INTERFACE, with power contact</td>
<td>① 24 V DC</td>
<td>PLC-RSP-24UC/21/RW</td>
<td>2987011</td>
</tr>
<tr>
<td>With spring-cage connection</td>
<td>② 24 V DC</td>
<td>PLC-RSP-24UC/21/RW</td>
<td>2987024</td>
</tr>
<tr>
<td></td>
<td>③ 24 V DC</td>
<td>PLC-RSP-24UC/21/RW</td>
<td>2987025</td>
</tr>
<tr>
<td>With push-in connection</td>
<td>① 24 V DC</td>
<td>PLC-RSP-24UC/21/RW</td>
<td>2987031</td>
</tr>
<tr>
<td></td>
<td>② 24 V DC</td>
<td>PLC-RSP-24UC/21/RW</td>
<td>2987032</td>
</tr>
<tr>
<td></td>
<td>③ 24 V DC</td>
<td>PLC-RSP-24UC/21/RW</td>
<td>2987033</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2987011</td>
<td>10</td>
</tr>
<tr>
<td>2987024</td>
<td>10</td>
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<tr>
<td>2987025</td>
<td>10</td>
</tr>
<tr>
<td>2987031</td>
<td>10</td>
</tr>
<tr>
<td>2987032</td>
<td>10</td>
</tr>
<tr>
<td>2987033</td>
<td>10</td>
</tr>
</tbody>
</table>

Notes:
Type of housing: Polyamide PA non-reinforced, color: green.
Marking systems and mounting material
See Catalog 5
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....
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.
Electrical service life diagrams, see page 346

1) EMC: Class A product, see page 571
## Relay modules

### PLC series

**Technical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.7 - 0.7 - 0.7 -</td>
<td>1.25 1.25 1.25</td>
</tr>
<tr>
<td>20 6 4.5</td>
<td>5 5 5</td>
</tr>
<tr>
<td>11 11 11</td>
<td>Yellow LED, Bridge rectifier, freewheeling diode</td>
</tr>
</tbody>
</table>

- **Single contact, 2-PDT**
  - AgNi, hard gold-plated
  - 250 V AC/DC: 30 V AC / 36 V DC
  - 5 V (at 100 mA): 100 mV
  - 2x 6 A: 50 mA
  - 15 A (300 ms): 50 mA
  - 10 mA (at 12 V): 1 mA

- **Ordering data**
  - **Type**
    - PLC-RSP- 24UC/21-21/RW
    - PLC-RPT- 24UC/21-21/RW
    - PLC-RSP- 110UC/21-21/RW
    - PLC-RPT- 24UC/21-21AU/RW
  - **Order No.**
    - 2987105
    - 2987121
    - 2987147
    - 2900346
    - 2900347
    - 2900348
  - **Pcs./Pkt.**
    - 10

**Interrupting rating for PLC-RSP...UC/21RW**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching voltage [V]</td>
<td>1.25 1.25 1.25</td>
</tr>
<tr>
<td>DC, ohmic load</td>
<td>10 A (With inserted bridge 2907691)</td>
</tr>
<tr>
<td>AC, ohmic load</td>
<td>10 mA</td>
</tr>
</tbody>
</table>

- **Single contact, 1-PDT**
  - AgNi
  - 250 V AC/DC: 12 V AC/DC
  - 10 A (With inserted bridge 2907691)

- **Ordering data**
  - **Type**
    - PLC-RSP- 24UC/21HC/RW
    - PLC-RPT- 24UC/21HC/RW
    - PLC-RSP- 110UC/21HC/RW
  - **Order No.**
    - 2900324
    - 2900325
    - 2900326
  - **Pcs./Pkt.**
    - 10

**Interrupting rating for PLC-RSP...UC/21HC/RW**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching voltage [V]</td>
<td>1.25 1.25 1.25</td>
</tr>
<tr>
<td>DC, ohmic load</td>
<td>10 A</td>
</tr>
</tbody>
</table>

- **Relaying**
  - **Type**
    - PLC-RSP- 24UC/21-21/RW
    - PLC-RPT- 24UC/21-21/RW
    - PLC-RSP- 24UC/21-21AU/RW
  - **Order No.**
    - 2987118
    - 2987134
    - 2987150
    - 2900349
    - 2900350
    - 2900351
  - **Pcs./Pkt.**
    - 10

**Interrupting rating for PLC-RSP...UC/21-21/RW**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching voltage [V]</td>
<td>1.25 1.25 1.25</td>
</tr>
<tr>
<td>DC, ohmic load</td>
<td>10 A</td>
</tr>
</tbody>
</table>

- **Connection data**
  - **Type**
    - Solid / Stranded / AWG 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
  - **Ordering data**
    - **Type**
      - PLC-RSP- 24UC/21-21/RW
      - PLC-RPT- 24UC/21-21/RW
      - PLC-RSP- 110UC/21-21/RW
    - **Order No.**
      - 2987105
      - 2900346
      - 2987118
  - **Pcs./Pkt.**
    - 10

**Dimensions**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>W / H / D</td>
<td>6.2 mm / 80 mm / 94 mm</td>
</tr>
</tbody>
</table>

For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT | 363

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
PLC electronic sensor terminal block for NAMUR proximity sensors

The PLC...EIK 1-SVN electronic sensor terminal block from Phoenix Contact converts the changeable resistance of a NAMUR sensor unit into a digital signal that can be read by all PLCs.

In addition, the electronics unit monitors the sensor side for short-circuits or wire breaks and reports this error via an integrated LED.

Due to a corresponding resistance circuit, the PLC...EIK 1-SVN can be used to monitor all mechanical switches (N/C contact or N/O contact) for short-circuits and/or wire break.

In addition to a high packing density, this switching amplifier features the following:
  - Regulated power supply for the NAMUR proximity switch
  - 24 V/50 mA digital output for directly connecting programmable logic controls
  - Connection option for PLC-V8 adapter
  - Screw, spring-cage, and push-in technology

**Technical data**

Supply

- Input supply nominal voltage $U_{Vin}$
- Typ. input current at $U_{Vin}$
- Transmission frequency $f_{trans}$

Control circuit

- No-load voltage
- Switching points in accordance with EN 60947-5-6:
  - ≥ 2.1 mA (In conductive state)
  - ≤ 1.2 mA (In blocking state)
  - 6.3 mA ... 10 mA (in the event of a short-circuit)
  - 0 mA ... 0.35 mA (In the event of a wire break)

Protective circuit

- Surge protection

Alarm output

- Operating voltage range (positive switching)
- Limiting continuous current
- Voltage drop at max. limiting continuous current
- Output protection

Signal output

- Limiting continuous current
- Voltage drop $U_{out}$ at max. limiting continuous current
- Output protection

General data

- Rated insulation voltage
- Rated surge voltage / insulation
- Ambient temperature (operation)
- Standards/regulations
- Pollution degree
- Surge voltage category
- Connection data solid / stranded / AWG
- Dimensions W / H / D

**Ordering data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching amplifier electronic terminal block, positive switching</td>
<td>PLC-SC-EIK 1-SVN 24P/P</td>
<td>2982663</td>
<td>10</td>
</tr>
<tr>
<td>With screw connection</td>
<td>PLC-SC-EIK 1-SVN 24P/P1</td>
<td>2982676</td>
<td>10</td>
</tr>
<tr>
<td>With spring-cage connection</td>
<td>PLC-SC-EIK 1-SVN 24P/P</td>
<td>2900397</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initiator state</th>
<th>Switching level</th>
<th>LED</th>
<th>Double-level terminal block, with preassembled resistors</th>
</tr>
</thead>
<tbody>
<tr>
<td>conductive</td>
<td>OUT</td>
<td>ERR</td>
<td>Green</td>
</tr>
<tr>
<td>blocking</td>
<td>H</td>
<td>L</td>
<td>OFF</td>
</tr>
<tr>
<td>short circuit</td>
<td>L</td>
<td>H</td>
<td>OFF</td>
</tr>
<tr>
<td>open circuit</td>
<td>L</td>
<td>H</td>
<td>OFF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Description</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UKK 5-2R/NAMUR</td>
<td>Double-level terminal block, with preassembled resistors</td>
<td>2941662</td>
<td>50</td>
</tr>
</tbody>
</table>

Notes:

Type of housing:
Polyamide PA non-reinforced, color: green.

Marking systems and mounting material
See Catalog 5

Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 8-PLC... or FBST 500...) and with safe isolation between neighboring modules.

1) EMC: Class A product, see page 571

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For inductive proximity sensors according to NAMUR, with light indicators for sensor signal and faults

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Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
PLC series

Electronic reversing load relay for DC motors

The PLC-S...-ELR W 1/2-24DC electronic reversing load relays are used to switch mechanically commutated DC motors up to 24 V/2 A.
- Wear-free reversing
- Braking by controlling both inputs
- Short-circuit and surge- and overload-proof output
- Integrated locking circuit and load wiring
- Screw, spring-cage, and push-in technology

Notes:
Type of housing: Polyester PBT non-reinforced, color: green.
Marking systems and mounting material
See Catalog 5

Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 6-PLC... or FBST 600...) and with safe isolation between neighboring modules.
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
PWM = Pulse Width Modulation
1) EMC: Class A product, see page 571

Technical data

Input data
Control voltage $U_{ST}$ right/left 24 V DC ±20%
Control input current $I_{ST}$ right/left Approx. 3 mA
Input protection: Yellow LED, Protection against polarity reversal, Surge protection

PWM option
Max. clock frequency of the PWM at the control inputs 1000 Hz
Pulse width repetition rate of the PWM 0% ... 100%
Output data
Supply voltage range $U_V$ 10 V DC ... 30 V DC
Quiescent current 10 mA
Output protection Green LED, Protection against polarity reversal, Surge protection

Motor switching output
Continuous current $I_A$ max. 2 A (see derating curve)
Current limitation at short-circuits 15 A (during braking)

General data
Rated insulation voltage 50 V DC
Rated surge voltage / insulation
Ambient temperature (operation) 
-25°C ... 60°C
IEC 60664, EN 50178, IEC 62103
2 / II
Mounting position
Vertical (horizontal DIN rail)
Mounting in rows with zero spacing
Connection data solid / stranded / AWG 0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14
Dimensions W / H / D 6.2 mm / 80 mm / 86 mm

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs./Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-SC-ELR W1/2-24DC</td>
<td>2980539</td>
<td>1</td>
</tr>
<tr>
<td>PLC-SP-ELR W1/2-24DC</td>
<td>2980555</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes:
Type of housing:
Polyester PBT non-reinforced, color: green.
Marking systems and mounting material
See Catalog 5

Separating plate PLC-ATP is to be used in the following cases: always at the start and end of a PLC terminal strip, for voltages greater than 250 V (L1, L2, L3) between the same terminal points of neighboring modules (potential bridging then takes place with FBST 6-PLC... or FBST 600...) and with safe isolation between neighboring modules.
For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
PWM = Pulse Width Modulation
1) EMC: Class A product, see page 571

With overload and short-circuit-proof output

Status table

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>M+</th>
<th>M-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td>Left</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>High resistance</td>
<td>High resistance</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>≈24 V</td>
<td>GND</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>GND</td>
<td>≈24 V</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>GND</td>
<td>GND</td>
</tr>
</tbody>
</table>

Derating curve for PLC-S...ELR W 1/2-24DC

Load current [A] vs. Ambient temperature [°C]

- Aligned without spacing
- Aligned with > 20 mm spacing

For additional information, visit www.phoenixcontact.net/products

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PLC INTERFACE
Pulse expansion module

A solid-state relay for acquiring and extending short pulses.
- Pulse detection can be set from > 0.1 ms or > 2 ms
- Status display
- Delay times of 10 to 2550, can be set via DIP switches
- Bridging options
- Can be retriggered
- Screw and push-in connection technology

Technical data

Input data

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated control supply voltage $U_S$</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Rated control supply voltage range with reference to $U_S$</td>
<td>0.8 ... 1.2</td>
</tr>
<tr>
<td>Rated current $I_S$</td>
<td>13 mA</td>
</tr>
<tr>
<td>Input high, output high</td>
<td>19 mA</td>
</tr>
<tr>
<td>Rated actuating voltage $U_C$</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Rated actuating current $I_C$</td>
<td>3 mA</td>
</tr>
<tr>
<td>Switching threshold &quot;0&quot; signal in reference to $U_C$</td>
<td>&lt; 0.4</td>
</tr>
<tr>
<td>Switching threshold &quot;1&quot; signal in reference to $U_C$</td>
<td>&gt; 0.8</td>
</tr>
<tr>
<td>Status indication</td>
<td>Yellow LED</td>
</tr>
<tr>
<td>Operating voltage display</td>
<td>Green LED</td>
</tr>
<tr>
<td>Input circuit</td>
<td>Protection against polarity reversal, Surge protection</td>
</tr>
<tr>
<td>Output data</td>
<td></td>
</tr>
<tr>
<td>Output voltage range $U_e$</td>
<td>3 V DC ... 48 V DC</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>100 mA</td>
</tr>
<tr>
<td>Voltage drop at max. limiting continuous current</td>
<td>&lt; 1 V DC</td>
</tr>
<tr>
<td>Output circuit</td>
<td>3-conductor, ground-referenced</td>
</tr>
<tr>
<td>Output protection</td>
<td>Protection against polarity reversal, Surge protection, Free running</td>
</tr>
<tr>
<td>General data</td>
<td></td>
</tr>
<tr>
<td>Rated insulation voltage</td>
<td>50 V DC</td>
</tr>
<tr>
<td>Rated surge voltage</td>
<td>0.5 kV</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-25°C ... 60°C</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>DIN EN 50178</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14</td>
</tr>
<tr>
<td>Dimensions</td>
<td>W / H / D</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-INTERFACE, with screw connection</td>
<td>PLC-OSC-LPE-24DC/48DC/100</td>
<td>2903171</td>
</tr>
<tr>
<td>PLC-INTERFACE, with push-in connection</td>
<td>PLC-OPT-LPE-24DC/48DC/100</td>
<td>2903173</td>
</tr>
</tbody>
</table>

Pulse expansion module
With DC voltage output
Max. 100 mA
For additional information, visit www.phoenixcontact.net/products

 Relay modules
 PLC series

 Input pulse $t_1 < \text{set output pulse } t_3$
 (no restart when triggered again)

 Input pulse $t_1 \geq \text{set output pulse } t_3$, then input pulse $t_1 = \text{output pulse } t_2$
 (no restart when triggered again)

 Input pulse $t_1 < \text{set output pulse } t_3$
 (restart when triggered again)

### DIP

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
<th>S7</th>
<th>S8</th>
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</thead>
<tbody>
<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1280</td>
</tr>
</tbody>
</table>
Relay modules

PLC series

PLC accessories

The PLC-ESK power terminal helps with supplying the bridge potentials; the PLC-ATP partition plate helps with optical and safe disconnection of the adjacent PLC modules. The PLC-BP (A1-14) passive feed-through bridge is used instead of a relay and connects the A1 and 14 terminal points.

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power terminal block, for supply of up to four potentials, with the same shape as PLC standard series, max. 32 A/250 V AC</td>
<td>gray</td>
</tr>
<tr>
<td>Separating plate, thickness 2 mm, required at the start and end of a PLC terminal strip. It is also used for visual separation of groups, safe isolation of different voltages of neighboring PLC interfaces as per DIN EN 50178/VDE0160, separation of neighboring bridges of different potentials, and separation of PLC interfaces at voltages &gt; 250 V</td>
<td>black</td>
</tr>
<tr>
<td>Screwdriver Blade: 0.6 x 3.5 x 100 mm, length: 181 mm</td>
<td>black</td>
</tr>
<tr>
<td>Passive feed-through bridge, can be plugged in instead of relay or solid-state relay, bridges terminal points A1 and 14</td>
<td>black</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cont. plug-in bridge, 500 mm long, isolated, can be cut to length, for potential distribution</td>
<td>red</td>
</tr>
<tr>
<td>Nominal current: 32 A</td>
<td>blue</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 6 mm long, for potential distribution</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>red</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 14 mm long, insulated, for potential distribution</td>
<td>blue</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 8 mm long, for potential distribution with a partition plate</td>
<td>black</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 10 A</td>
<td>black</td>
</tr>
<tr>
<td>Zack marker strip, printed horizontally, 10-section, with consecutive numbers, e.g., 1-10, 11-20, etc. up to 91-100</td>
<td>black</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cont. plug-in bridge, 500 mm long, isolated, can be cut to length, for potential distribution</td>
<td>red</td>
</tr>
<tr>
<td>Nominal current: 32 A</td>
<td>blue</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 6 mm long, for potential distribution</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>red</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 14 mm long, insulated, for potential distribution</td>
<td>blue</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 8 mm long, for potential distribution with a partition plate</td>
<td>black</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 10 A</td>
<td>black</td>
</tr>
<tr>
<td>Zack marker strip, printed horizontally, 10-section, with consecutive numbers, e.g., 1-10, 11-20, etc. up to 91-100</td>
<td>black</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cont. plug-in bridge, 500 mm long, isolated, can be cut to length, for potential distribution</td>
<td>red</td>
</tr>
<tr>
<td>Nominal current: 32 A</td>
<td>blue</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 6 mm long, for potential distribution</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>red</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 14 mm long, insulated, for potential distribution</td>
<td>blue</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 8 mm long, for potential distribution with a partition plate</td>
<td>black</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 10 A</td>
<td>black</td>
</tr>
<tr>
<td>Zack marker strip, printed horizontally, 10-section, with consecutive numbers, e.g., 1-10, 11-20, etc. up to 91-100</td>
<td>black</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cont. plug-in bridge, 500 mm long, isolated, can be cut to length, for potential distribution</td>
<td>red</td>
</tr>
<tr>
<td>Nominal current: 32 A</td>
<td>blue</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 6 mm long, for potential distribution</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>red</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 14 mm long, insulated, for potential distribution</td>
<td>blue</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 8 mm long, for potential distribution with a partition plate</td>
<td>black</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 10 A</td>
<td>black</td>
</tr>
<tr>
<td>Zack marker strip, printed horizontally, 10-section, with consecutive numbers, e.g., 1-10, 11-20, etc. up to 91-100</td>
<td>black</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cont. plug-in bridge, 500 mm long, isolated, can be cut to length, for potential distribution</td>
<td>red</td>
</tr>
<tr>
<td>Nominal current: 32 A</td>
<td>blue</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 6 mm long, for potential distribution</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>red</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 14 mm long, insulated, for potential distribution</td>
<td>blue</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 8 mm long, for potential distribution with a partition plate</td>
<td>black</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 10 A</td>
<td>black</td>
</tr>
<tr>
<td>Zack marker strip, printed horizontally, 10-section, with consecutive numbers, e.g., 1-10, 11-20, etc. up to 91-100</td>
<td>black</td>
</tr>
</tbody>
</table>

PLC accessories

The colored isolated FBST plug-in bridges are not required for the PLC interface up to 70%. The 500 mm long FBST 500-PLC “endless bridges” are especially effective. The 2-pos. FBST 6 single plug-in bridges are especially suited for bridging a smaller number of PLC modules.

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cont. plug-in bridge, 500 mm long, insulated, can be cut to length, for potential distribution</td>
<td>red</td>
</tr>
<tr>
<td>Nominal current: 32 A</td>
<td>blue</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 6 mm long, for potential distribution</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>red</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 14 mm long, insulated, for potential distribution</td>
<td>blue</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Plug-in bridge, 2-pos., 8 mm long, for potential distribution with a partition plate</td>
<td>black</td>
</tr>
<tr>
<td>Nominal current: 6 A</td>
<td>gray</td>
</tr>
<tr>
<td>Nominal current: 10 A</td>
<td>black</td>
</tr>
<tr>
<td>Zack marker strip, printed horizontally, 10-section, with consecutive numbers, e.g., 1-10, 11-20, etc. up to 91-100</td>
<td>black</td>
</tr>
</tbody>
</table>
Adapter for PLC-INTERFACE

**PLC-V8/...** are VARIOFACE adapters which connect the 6.2 mm wide PLC RELAY modules to the VARIOFACE system cabling.

### Technical data

Max. perm. operating voltage 24 V DC ±25%
Max. perm. current (per branch) 1 A (per signal path)
Test voltage 500 V AC (50 Hz, 1 min.)
Ambient temperature (operation) -40°C ... 70°C
Standards/regulations IEC 60664, DIN EN 50178, IEC 62103
Connection method Power supply Screw connection
Signal level IDC/FLK pin strip (2.54 mm)
Connection data solid / stranded / AWG 0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12
Dimensions H / D 100 mm / 94 mm

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>No. of pos.</th>
<th>Module width W</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPUT</td>
<td>14</td>
<td>49.6 mm</td>
<td>PLC-V8/FLK14/OUT</td>
<td>2295554</td>
<td>1</td>
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<tr>
<td>INPUT</td>
<td>14</td>
<td>49.6 mm</td>
<td>PLC-V8/FLK14/IN</td>
<td>2296553</td>
<td>1</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>14</td>
<td>49.6 mm</td>
<td>PLC-V8/FLK14/OUT/M</td>
<td>2304102</td>
<td>1</td>
</tr>
<tr>
<td>INPUT</td>
<td>14</td>
<td>49.6 mm</td>
<td>PLC-V8/FLK14/IN/M</td>
<td>2304115</td>
<td>1</td>
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<tr>
<td>OUTPUT</td>
<td>14</td>
<td>112.3 mm</td>
<td>PLC-V8L/FLK14/OUT</td>
<td>2299660</td>
<td>1</td>
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<tr>
<td>INPUT</td>
<td>14</td>
<td>112.3 mm</td>
<td>PLC-V8L/FLK14/OUT/M</td>
<td>2304306</td>
<td>1</td>
</tr>
</tbody>
</table>

**Notes:**
For cross-reference list with matching PLC-INTERFACE modules, see page 488.

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For additional information, visit [www.phoenixcontact.net/products](http://www.phoenixcontact.net/products)
The PR series is a low-priced relay modular system, consisting of DIN rail bases, relays, plug-in input/interference suppression modules, engagement levers, and the matching marking labels and universal bridging materials for all bases. The modules are largely compatible with the usual standards on the market, have the major international approvals and are therefore accepted worldwide.

Besides the familiar relay bases with the screw connection method, relay bases with the spring-cage connection method for miniature power relays with one or two PDT contacts and for industrial relays with two or four PDT contacts are available in the PR series. The connections in these bases are configured with double spring cages for free, simple bridging of all potentials.

The PR series also boasts its own particular features:

– Relay retaining bracket: The EL... plastic relay retaining bracket, with which the relays can be held and, if necessary, ejected, have an exposed, smooth, large equipment marking area for standard self-adhesive labels that can be printed easily and inexpensively using standard printers. When fitted, the engagement lever is securely connected to the base, which means that the labeling cannot be lost.

– Industrial relays: All REL-IR... industrial relays have as standard an LED status display and all DC types also have an integrated freewheeling diode. In most cases, this eliminates the plug-in input modules that are otherwise also used.

– Plug-in input modules with RC element: most standard input/interference suppression modules with an RC element used for compensation of interference coupling on long lines or in the event of leakage currents from electronic AC outputs have only low capacitance values. This greatly limits the filter effect. In contrast, the RC-120-230UC and RC3-120-230UC plug-in module series for mains voltage applications have a filter function that is improved up to a factor of 10. Unlike with the discharge resistors that are normally used for such applications, using RC plug-in modules gives rise to no additional heating!
PR1 series
The narrow 16 mm PR1 base series for relays with one or two contacts is available with a screw or spring-cage connection method. Both the traditional 2/2-level bases and two modern “logical” 1/3-level versions with fully opposite coil and contact connections are available.

PR2 series
The PR2 base series accommodates plug-in industrial relays with two or four PDT contacts. Like the PR1 series, the bases are available with screw and spring-cage connection methods, as well as in the traditional 2/2-level and modern “logical” 1/3-level versions.

PR3 series
The robust octal relays with two or three PDT contacts that are widely used in some areas fit on the PR3 base with touch-protected screw connections. All the base connections have a wide connection cross section and are arranged on one level with good accessibility.

The active components of the PR1 modular system include various miniature power relays (optionally available with manual test function) and electronic solid-state relays. Matching relay retaining brackets with integrated marking area prevent them from being shaken loose. Depending on requirements, input/interference suppression modules with various functions can also be plugged in. Marking labels and loop bridges in various colors that are suitable for universal use with all PR bases complete the range of accessories.

The PR2 modular system is specifically designed for plug-in industrial relays. Industrial relays from Phoenix Contact feature the following as standard: a manual test button, switch position indicator, status LED, and freewheeling diode (DC coils only). Interference suppression modules with a varistor or RC element can also be plugged in as an option. Relay retaining brackets with integrated marking areas prevent the relays from being shaken loose. Marking labels and loop bridges in various colors that are suitable for universal use with all PR bases complete the range of accessories.

The PR3 modular system is specifically designed for the robust octal relays. The relays have a switch position indicator and a manual test button and there is a wire bracket to prevent them from being shaken loose. Input/interference suppression modules with various functions can also be plugged in as an option. The base can be marked with an 8 x 20 mm standard adhesive label. Loop bridges in various colors for universal use round off the range of accessories.
Relay modules

PR series

Modular PR1 relay base

Range of relay bases that can be fitted with 1 PDT or 2 PDT relay or solid-state relay
Range of accessories includes:
– Plug-in input modules/interference suppression modules
– Relay retaining bracket with labeling field and ejection function
– Marking labels
– Loop bridges

Notes:
Type of housing:
Polyamide fiber reinforced PA-F, color: green.
Marking systems and mounting material
See Catalog 5

Technical data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage $U_n$</td>
<td>300 V AC/DC</td>
</tr>
<tr>
<td>Nominal current at $U_n$</td>
<td>12 A</td>
</tr>
<tr>
<td>General data</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-25°C ... 85°C</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 14</td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>16 mm</td>
</tr>
<tr>
<td>Depth with retaining bracket</td>
<td>63 mm (EL1-P16)</td>
</tr>
<tr>
<td></td>
<td>71 mm (EL1-P25)</td>
</tr>
<tr>
<td>Height</td>
<td>75 mm</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay base PR1, 2/2-level design, plug-in option for input/interference suppression module, safe isolation I/O, including ten MP1 marking labels per pack</td>
<td>PR1-BSC2/2X21 2833518</td>
<td>10</td>
</tr>
<tr>
<td>Relay base PR1, 1/3-level design, plug-in option for input/interference suppression module, safe isolation I/O, including ten MP1 marking labels per pack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay base PR1, 1/3-level design, plug-in option for input/interference suppression module, safe isolation I/O, including ten MP1 marking labels per pack</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay retaining bracket, with ejector function and integrated equipment marking area (7.5 x 15 mm), suitable for relay socket PR1</td>
<td>EL1-P16 2833547</td>
<td>10</td>
</tr>
<tr>
<td>Relay retaining bracket, with ejector function and integrated equipment marking area (7.5 x 15 mm), suitable for relay socket PR1</td>
<td>EL1-P25 2833550</td>
<td>10</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment marking label, labeling surface 6 x 15 mm</td>
<td>MP 1 2833631</td>
<td>10</td>
</tr>
<tr>
<td>Device marking label, for thermal transfer printer, labeling surface 6 x 15 mm, 2500 labels per roll</td>
<td>EML (15X6) R YE 0819288</td>
<td>1</td>
</tr>
<tr>
<td>Loop bridge, 50-pos., divisible, max. bridging distance 60 mm, 0.5 mm²</td>
<td>DB 50-90 BU 2821180</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>DB 50-90 BK 2820916</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>DB 50-90 GY 2820929</td>
<td>1</td>
</tr>
</tbody>
</table>

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Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
Relay modules

PR series

1/3-level design with screw connection

1/3-level design with spring-cage connection

Relay retaining bracket

### Technical data

<table>
<thead>
<tr>
<th></th>
<th>300 V AC/DC</th>
<th>300 V AC/DC</th>
<th>300 V AC/DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>300 V AC/DC</td>
<td>300 V AC/DC</td>
<td>300 V AC/DC</td>
</tr>
<tr>
<td>Amperage</td>
<td>12 A</td>
<td>10 A</td>
<td>-</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-25°C ... 85°C</td>
<td>-25°C ... 85°C</td>
<td>-</td>
</tr>
<tr>
<td>Wire size</td>
<td>0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 14</td>
<td>0.5 ... 1.5 mm² / 0.5 ... 1.5 mm² / 26 - 16</td>
<td>-</td>
</tr>
<tr>
<td>Width</td>
<td>16 mm</td>
<td>16 mm</td>
<td>-</td>
</tr>
<tr>
<td>Height</td>
<td>71 mm (EL1-P16)</td>
<td>72 mm (EL1-P16)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>79 mm (EL1-P25)</td>
<td>80 mm (EL1-P25)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>79.5 mm</td>
<td>97 mm</td>
<td>-</td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR1-BSC3/2X21</td>
<td>2833521</td>
<td>10</td>
</tr>
<tr>
<td>EL1-P16</td>
<td>2833547</td>
<td>10</td>
</tr>
<tr>
<td>EL1-P25</td>
<td>2833550</td>
<td>10</td>
</tr>
<tr>
<td>PR1-BSP3/2X21</td>
<td>2833534</td>
<td>10</td>
</tr>
<tr>
<td>EL1-P16</td>
<td>2833547</td>
<td>10</td>
</tr>
<tr>
<td>EL1-P25</td>
<td>2833550</td>
<td>10</td>
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### Accessories

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>MP 1</td>
<td>2833631</td>
<td>10</td>
<td>MP 1</td>
<td>2833631</td>
<td>10</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>EML (15X6) R YE</td>
<td>0819288</td>
<td>1</td>
<td>EML (15X6) R YE</td>
<td>0819288</td>
<td>1</td>
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<td></td>
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</tr>
<tr>
<td>DB 50-90 BU</td>
<td>2821180</td>
<td>1</td>
<td>DB 50-90 BU</td>
<td>2821180</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DB 50-90 BK</td>
<td>2820916</td>
<td>1</td>
<td>DB 50-90 BK</td>
<td>2820916</td>
<td>1</td>
<td></td>
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</tr>
<tr>
<td>DB 50-90 GY</td>
<td>2820929</td>
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<td>DB 50-90 GY</td>
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</tr>
</tbody>
</table>

For additional information, visit www.phoenixcontact.net/products

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Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
Plug-in miniature power relays

Plug-in miniature power relays with 1 or 2 PDT contacts, suitable for RIF-1, PR1, and PLC-INTERFACE relay bases.

The advantages:
- Power contacts up to 16 A
- Multi-layer gold contact or power contact
- High degree of protection up to RT III (comparable with IP67) depending on type

Notes:
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

### Technical data

#### Input data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage U_{IN}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in miniature power relays</td>
<td></td>
</tr>
<tr>
<td>with power contact</td>
<td>12 V DC</td>
</tr>
<tr>
<td>with power contact</td>
<td>24 V DC</td>
</tr>
<tr>
<td>with power contact</td>
<td>48 V DC</td>
</tr>
<tr>
<td>with power contact</td>
<td>60 V DC</td>
</tr>
<tr>
<td>with power contact</td>
<td>110 V DC</td>
</tr>
<tr>
<td>with power contact</td>
<td>24 V AC</td>
</tr>
<tr>
<td>with power contact</td>
<td>120 V AC</td>
</tr>
</tbody>
</table>

#### Output data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Single contact, 1-PDT</th>
<th>Single contact, 2-PDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact type</td>
<td></td>
<td>AgNi</td>
<td>AgNi, hard gold-plated</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>16 A</td>
<td>50 mA</td>
<td>50 mA</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>12 V (at 10 mA)</td>
<td>100 mV (at 10 mA)</td>
<td>100 mV (at 10 mA)</td>
</tr>
<tr>
<td>Max. inrush current</td>
<td>25 A (20 ms)</td>
<td>50 mA</td>
<td>50 mA</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>10 mA (at 12 V)</td>
<td>1 mA (at 24 V)</td>
<td>1 mA (at 24 V)</td>
</tr>
</tbody>
</table>

#### General data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No. Pcs. / Pkt.</th>
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<tbody>
<tr>
<td>Relay modules</td>
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<td>REL-MR-12DC/21HC 2961309 10</td>
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<tr>
<td>PR series</td>
<td></td>
<td>REL-MR-24DC/21HC 2961312 10</td>
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<tr>
<td></td>
<td></td>
<td>REL-MR-48DC/21HC 2963462 10</td>
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<td>REL-MR-60DC/21HC 2961325 10</td>
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<td>REL-MR-110DC/21HC 2961338 10</td>
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<td></td>
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<td>REL-MR-24AC/21HC 2961406 10</td>
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<tr>
<td></td>
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<td>REL-MR-120AC/21HC 2961419 10</td>
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<td></td>
<td></td>
<td>REL-MR-24AC/21HC AU 2961422 10</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No. Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay modules</td>
<td></td>
<td>REL-MR-12DC/21HC 2961309 10</td>
</tr>
<tr>
<td>PR series</td>
<td></td>
<td>REL-MR-24DC/21HC 2961312 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REL-MR-48DC/21HC 2963462 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REL-MR-60DC/21HC 2961325 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REL-MR-110DC/21HC 2961338 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REL-MR-24AC/21HC 2961406 10</td>
</tr>
<tr>
<td></td>
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<td>REL-MR-120AC/21HC 2961419 10</td>
</tr>
<tr>
<td></td>
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<td>REL-MR-24AC/21HC AU 2961422 10</td>
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</table>

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No. Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay modules</td>
<td>REL-MR-12DC/21HC 2961309 10</td>
</tr>
<tr>
<td>PR series</td>
<td>REL-MR-24DC/21HC 2961312 10</td>
</tr>
<tr>
<td></td>
<td>REL-MR-48DC/21HC 2963462 10</td>
</tr>
<tr>
<td></td>
<td>REL-MR-60DC/21HC 2961325 10</td>
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<td>REL-MR-110DC/21HC 2961338 10</td>
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<tr>
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<td>REL-MR-24AC/21HC 2961406 10</td>
</tr>
<tr>
<td></td>
<td>REL-MR-120AC/21HC 2961419 10</td>
</tr>
<tr>
<td></td>
<td>REL-MR-24AC/21HC AU 2961422 10</td>
</tr>
</tbody>
</table>

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<thead>
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<tr>
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<td>REL-MR-12DC/21HC 2961309 10</td>
</tr>
<tr>
<td>PR series</td>
<td>REL-MR-24DC/21HC 2961312 10</td>
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<td>REL-MR-48DC/21HC 2963462 10</td>
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<tr>
<td></td>
<td>REL-MR-60DC/21HC 2961325 10</td>
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<td>REL-MR-24AC/21HC 2961406 10</td>
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<td></td>
<td>REL-MR-120AC/21HC 2961419 10</td>
</tr>
<tr>
<td></td>
<td>REL-MR-24AC/21HC AU 2961422 10</td>
</tr>
</tbody>
</table>

Relay modules

PR series

Plug-in miniature power relays

1 PDT relay

2 PDT relay

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
Plug-in miniature power relays with 1 or 2 PDT contacts, suitable for RIF-1 and PR1 relay bases.

The advantages:
- Switching current of up to 16 A
- With lockable manual operation
- Mechanical switch position indicator
- Integrated status LED
- Multi-layer gold contact or power contact
- DC types with integrated freewheeling diode
- Can be soldered in on PCB

Notes:
If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.

### Technical data

**Input data**

| Permissible range (with reference to \( U_{\text{IN}} \)) | [mA] | 18 | 32 | 7 | 3.5 |
| Typ. input current at \( U_{\text{IN}} \) | | 9 | 3 - 12 | 3 - 12 |
| Typ. release time at \( U_{\text{IN}} \) (depending on phase relation) | [ms] | 6 | 2 - 8 | 2 - 8 | 2 - 8 |

**Output data**

**Contact type**

<table>
<thead>
<tr>
<th>Single contact, 1-PDT</th>
<th>Single contact, 1-PDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgNi</td>
<td>AgNi, hard gold-plated</td>
</tr>
<tr>
<td>250 V AC/DC</td>
<td>30 V AC / 36 V DC</td>
</tr>
<tr>
<td>12 V (at 10 mA)</td>
<td>12 V (At 1 mA)</td>
</tr>
<tr>
<td>16 A</td>
<td>50 mA</td>
</tr>
<tr>
<td>32 A (20 ms)</td>
<td>50 mA</td>
</tr>
<tr>
<td>10 mA (at 12 V)</td>
<td>1 mA (at 12 V)</td>
</tr>
</tbody>
</table>

**General data**

| Test voltage (winding / contact) | 5 kV AC (50 Hz, 1 min.) |
| Test voltage (contact/contact) | -40°C ... 70°C |
| Ambient temperature (operation) | 5 x 10⁴ cycles |
| Mechanical service life | See diagram |
| Electrical service life | DIN EN 61810-1, VDE 0435-201, EN 50178, IEC 62103 |
| Standards/regulations | DIN EN 61810-1, VDE 0435-201, EN 50178, IEC 62103 |

### Ordering data

#### Plug-in miniature power relays, with power contacts

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-MR-24DC/21HC/MS</td>
<td>2987888</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-24AC/21HC/MS</td>
<td>298791</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-230AC/21HC/MS</td>
<td>2987914</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-24DC/21HC AU/MS</td>
<td>2987927</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-230AC/21HC AU/MS</td>
<td>2987930</td>
<td>10</td>
</tr>
</tbody>
</table>

#### Plug-in miniature power relays with manual test function, with hard gold-plated multi-layer contacts, mechanical switch position indicator

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-MR-24DC/21-21HC/MS</td>
<td>298791</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-24AC/21-21HC/MS</td>
<td>2987914</td>
<td>10</td>
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<tr>
<td>REL-MR-230AC/21-21HC/MS</td>
<td>2987930</td>
<td>10</td>
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<tr>
<td>REL-MR-24DC/21-21HC AU/MS</td>
<td>2987927</td>
<td>10</td>
</tr>
<tr>
<td>REL-MR-230AC/21-21HC AU/MS</td>
<td>2987930</td>
<td>10</td>
</tr>
</tbody>
</table>
**REL-MR...21HC...MS (1 PDT)**

**Operating voltage range**
![Graph showing operating voltage range](image1)

**Interrupting rating**
![Graph showing interrupting rating](image2)

**Electrical service life**
![Graph showing electrical service life](image3)

Service life reduction factor with various cos phi

**REL-MR...21-21...MS (2 PDTs)**

**Operating voltage range**
![Graph showing operating voltage range](image4)

**Interrupting rating**
![Graph showing interrupting rating](image5)

**Electrical service life**
![Graph showing electrical service life](image6)

Service life reduction factor with various cos phi

For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT

PHOENIX CONTACT
Relay modules

PR series

Modular PR2 relay base

Range of relay bases that can be fitted with 2 PDT or 4 PDT relays

Range of accessories includes:
- Plug-in input modules/interference suppression modules
- Relay retaining bracket with labeling field and ejection function
- Marking labels
- Loop bridges

Notes:

Type of housing:
Polyamide fiber reinforced PA-F, color: green.

Marking systems and mounting material
See Catalog 5

Technical data

<table>
<thead>
<tr>
<th>Nominal voltage $U_n$</th>
<th>300 V AC/DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal current at $U_n$</td>
<td>12 A</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-25°C ... 85°C</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 26 - 16</td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>27 mm</td>
</tr>
<tr>
<td>Depth with retaining bracket</td>
<td>84 mm (EL2-P35)</td>
</tr>
<tr>
<td>Height</td>
<td>75 mm</td>
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Ordering data

<table>
<thead>
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<th>Type</th>
<th>Order No.</th>
<th>Pcs./Pkt.</th>
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</thead>
<tbody>
<tr>
<td>Relay base PR2-B, for industrial relay, REL-IR with two or four PDTs, 2/2-level design, connection option for input/interference suppression module, including ten MP2 marking labels per packaging</td>
<td>PR2-BSC2/4X21</td>
<td>2833563</td>
<td>10</td>
</tr>
<tr>
<td>Relay retaining bracket, with eject function and integrated device marking area (8 x 25 mm), to suit relay base PR2, for 35 mm high industrial relay</td>
<td>EL2-P35</td>
<td>2833592</td>
<td>10</td>
</tr>
</tbody>
</table>

Accessories

| Equipment marking label, labeling surface 6 x 15 mm | |
| Equipment marking label, labeling surface 9 x 25 mm | |
| Device marking label, for thermal transfer printer, labeling surface 6 x 15 mm, 2500 labels per roll | |
| Loop bridge, 50-pos., divisible, max. bridging distance 60 mm, 0.5 mm² | |

See Catalog 5
### Technical data

<table>
<thead>
<tr>
<th>300 V AC/DC</th>
<th>300 V AC/DC</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 A</td>
<td>10 A</td>
<td>-</td>
</tr>
<tr>
<td>-25°C ... 85°C</td>
<td>-25°C ... 85°C</td>
<td>-</td>
</tr>
<tr>
<td>0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 26 - 16</td>
<td>0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16</td>
<td>-</td>
</tr>
<tr>
<td>27 mm</td>
<td>31 mm</td>
<td>-</td>
</tr>
<tr>
<td>86 mm (EL2-P35)</td>
<td>84 mm (EL2-P35)</td>
<td>-</td>
</tr>
<tr>
<td>78.5 mm</td>
<td>95 mm</td>
<td>-</td>
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</table>

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR2-BSC3/4X21</td>
<td>2833576</td>
<td>10</td>
</tr>
<tr>
<td>PR2-BSP3/4X21</td>
<td>2833589</td>
<td>10</td>
</tr>
<tr>
<td>EL2-P35</td>
<td>2833592</td>
<td>10</td>
</tr>
</tbody>
</table>

| Accessories
| Mp 1 | 2833631 | 10 |

| EML (15X6) R YE | 0819288 | 1 |
| DB 50-90 BU | 2821180 | 1 |
| DB 50-90 BK | 2820916 | 1 |
| DB 50-90 GY | 2820929 | 1 |
| DB 50-90 BK | 2820916 | 1 |
| DB 50-90 GY | 2820929 | 1 |

For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
# Relay modules

## PR series

### Plug-in industrial relays suitable for PR2 relay base

Plug-in industrial relays with 2 or 4 PDT contacts, suitable for PR2 and RIF-2 relay bases.

- Lockable manual operation
- Mechanical switch position indicator
- Integrated status LED
- Multi-layer gold contact or power contact
- DC types with integrated freewheeling diode

### Notes:

For 48 V DC and 60 V DC types, see www.phoenixcontact.net/products

---

### Technical data

**Type**

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in industrial relay with a test button, status LED, mechanical switch position indicator</td>
<td>REL-IR/LDP- 12DC/2X21</td>
<td>REL-IR/LDP- 12DC/2X21</td>
<td>2834012</td>
<td>10</td>
</tr>
<tr>
<td>with freewheeling diode, A1 +, A2 -</td>
<td>REL-IR/LDP- 24DC/2X21</td>
<td>REL-IR/LDP- 24DC/2X21</td>
<td>2834025</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/LDP- 110DC/2X21</td>
<td>REL-IR/LDP- 110DC/2X21</td>
<td>REL-IR/LDP- 110DC/2X21</td>
<td>2834041</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/LDP-125DC/2X21</td>
<td>REL-IR/LDP-125DC/2X21</td>
<td>REL-IR/LDP-125DC/2X21</td>
<td>2834960</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/LDP-220DC/2X21</td>
<td>REL-IR/LDP-220DC/2X21</td>
<td>REL-IR/LDP-220DC/2X21</td>
<td>2834957</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/L- 24AC/2X21</td>
<td>REL-IR/L- 24AC/2X21</td>
<td>REL-IR/L- 24AC/2X21</td>
<td>2834054</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/L-120AC/2X21</td>
<td>REL-IR/L-120AC/2X21</td>
<td>REL-IR/L-120AC/2X21</td>
<td>2834067</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/L-230AC/2X21</td>
<td>REL-IR/L-230AC/2X21</td>
<td>REL-IR/L-230AC/2X21</td>
<td>2834070</td>
<td>10</td>
</tr>
<tr>
<td>Plug-in industrial relay with a test button, status LED, mechanical switch position indicator (Japanese standard)</td>
<td>REL-IR/LDM- 12DC/2X21</td>
<td>REL-IR/LDM- 12DC/2X21</td>
<td>2834151</td>
<td>10</td>
</tr>
<tr>
<td>with freewheeling diode, A1 +, A2 -</td>
<td>REL-IR/LDM- 24DC/2X21</td>
<td>REL-IR/LDM- 24DC/2X21</td>
<td>2834164</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/LDM-48DC/2X21</td>
<td>REL-IR/LDM-48DC/2X21</td>
<td>REL-IR/LDM-48DC/2X21</td>
<td>2834177</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/LDM-110DC/2X21</td>
<td>REL-IR/LDM-110DC/2X21</td>
<td>REL-IR/LDM-110DC/2X21</td>
<td>2834180</td>
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### Ordering data

**Type**

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<th>Input voltage</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in industrial relay with a test button, status LED, mechanical switch position indicator (Japanese standard)</td>
<td>REL-IR/LDP- 12DC/2X21</td>
<td>REL-IR/LDP- 12DC/2X21</td>
<td>2834012</td>
<td>10</td>
</tr>
<tr>
<td>with freewheeling diode, A1 +, A2 -</td>
<td>REL-IR/LDP- 24DC/2X21</td>
<td>REL-IR/LDP- 24DC/2X21</td>
<td>2834025</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/LDP- 110DC/2X21</td>
<td>REL-IR/LDP- 110DC/2X21</td>
<td>REL-IR/LDP- 110DC/2X21</td>
<td>2834041</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/LDP-125DC/2X21</td>
<td>REL-IR/LDP-125DC/2X21</td>
<td>REL-IR/LDP-125DC/2X21</td>
<td>2834960</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/LDP-220DC/2X21</td>
<td>REL-IR/LDP-220DC/2X21</td>
<td>REL-IR/LDP-220DC/2X21</td>
<td>2834957</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/L- 24AC/2X21</td>
<td>REL-IR/L- 24AC/2X21</td>
<td>REL-IR/L- 24AC/2X21</td>
<td>2834054</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/L-120AC/2X21</td>
<td>REL-IR/L-120AC/2X21</td>
<td>REL-IR/L-120AC/2X21</td>
<td>2834067</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/L-230AC/2X21</td>
<td>REL-IR/L-230AC/2X21</td>
<td>REL-IR/L-230AC/2X21</td>
<td>2834070</td>
<td>10</td>
</tr>
<tr>
<td>Plug-in industrial relay with a test button, status LED, mechanical switch position indicator (Japanese standard)</td>
<td>REL-IR/LDM- 12DC/2X21</td>
<td>REL-IR/LDM- 12DC/2X21</td>
<td>2834151</td>
<td>10</td>
</tr>
<tr>
<td>with freewheeling diode, A1 +, A2 -</td>
<td>REL-IR/LDM- 24DC/2X21</td>
<td>REL-IR/LDM- 24DC/2X21</td>
<td>2834164</td>
<td>10</td>
</tr>
<tr>
<td>REL-IR/LDM-48DC/2X21</td>
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<td>REL-IR/LDM-48DC/2X21</td>
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<tr>
<td>REL-IR/LDM-110DC/2X21</td>
<td>REL-IR/LDM-110DC/2X21</td>
<td>REL-IR/LDM-110DC/2X21</td>
<td>2834180</td>
<td>10</td>
</tr>
</tbody>
</table>
REL-IR...2x21 (2 PDTs)

Operating voltage range

AC interrupting rating

DC interrupting rating

Electrical service life

Service life reduction factor

REL-IR...4x21AU (4 PDTs)

Operating voltage range

AC interrupting rating

DC interrupting rating

Electrical service life

Service life reduction factor

For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
## Modular PR3 relay base

Range of relay bases that can be fitted with 2 PDT or 3 PDT relays

Range of accessories includes:
- Plug-in input modules/interference suppression modules
- Relay retaining bracket
- Loop bridges

### Technical data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage $U_{N}$</td>
<td>400 V AC/DC</td>
</tr>
<tr>
<td>Nominal current at $U_{N}$</td>
<td>10 A</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-40°C ... 85°C</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 14</td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>38 mm</td>
</tr>
<tr>
<td>Depth with retaining bracket</td>
<td>84 mm (EL3-M52)</td>
</tr>
<tr>
<td>Height</td>
<td>75 mm</td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs./Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay base PR3, for octal relay REL-OR with two PDTs, plug-in option for input/interference suppression modules</td>
<td>PR3-BSC1/2X21</td>
<td>2833602</td>
<td>10</td>
</tr>
<tr>
<td>With screw connection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay base PR3, for octal relay REL-OR with three PDTs, plug-in option for input/interference suppression modules</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With screw connection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relay retaining bracket, wiring to suit relay base PR3, for 52 mm high octal relay</td>
<td>EL3-M52</td>
<td>2833628</td>
<td>10</td>
</tr>
<tr>
<td>Loop bridge, 50-pos., divisible, max. bridging distance 60 mm, 0.5 mm²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>blue</td>
<td>DB 50-90 BU</td>
<td>2821180</td>
<td>1</td>
</tr>
<tr>
<td>black</td>
<td>DB 50-90 BK</td>
<td>2820916</td>
<td>1</td>
</tr>
<tr>
<td>gray</td>
<td>DB 50-90 GY</td>
<td>2820929</td>
<td>1</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs./Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB 50-90 BU</td>
<td></td>
<td>2821180</td>
<td>1</td>
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<tr>
<td>DB 50-90 BK</td>
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<td>2820916</td>
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<tr>
<td>DB 50-90 GY</td>
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<td>2820929</td>
<td>1</td>
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</tbody>
</table>
### Technical data

<table>
<thead>
<tr>
<th></th>
<th>PR3-BSC1/3X21</th>
<th>EL3-M52</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Order No.</td>
<td>Pcs. / Pkt.</td>
</tr>
<tr>
<td>400 V AC/DC</td>
<td>2833615</td>
<td>10</td>
</tr>
<tr>
<td>10 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-40°C ... 85°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 26 - 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>84 mm (EL3-M52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75 mm</td>
<td></td>
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</table>

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR3-BSC1/3X21</td>
<td>2833615</td>
<td>10</td>
</tr>
<tr>
<td>EL3-M52</td>
<td>2833628</td>
<td>10</td>
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</table>

### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs.</th>
</tr>
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<tbody>
<tr>
<td>DB 50-90 BU</td>
<td>2821180</td>
<td>1</td>
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<tr>
<td>DB 50-90 BK</td>
<td>2820916</td>
<td>1</td>
</tr>
<tr>
<td>DB 50-90 GY</td>
<td>2820929</td>
<td>1</td>
</tr>
</tbody>
</table>

For additional information, visit www.phoenixcontact.net/products

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
Plug-in octal relays suitable for PR3 relay base

Plug-in octal relays with 2 or 3 PDT contacts, suitable for PR3 and RIF-3 relay bases.

The advantages:
– Lockable manual operation
– Mechanical switch position indicator
– Extremely robust design

### Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typ. input current at ( U_a ) [mA]</td>
<td>Typ. response time at ( U_a ) [ms]</td>
</tr>
<tr>
<td>56</td>
<td>12</td>
</tr>
<tr>
<td>110</td>
<td>12</td>
</tr>
<tr>
<td>22</td>
<td>5 - 20</td>
</tr>
<tr>
<td>10</td>
<td>5 - 20</td>
</tr>
<tr>
<td>Output data</td>
<td>Service life</td>
</tr>
<tr>
<td>Contact type</td>
<td>Input voltage</td>
</tr>
<tr>
<td>Single contact, 2-PDT</td>
<td>REL-OR-24DC/2X21 2834232 10</td>
</tr>
<tr>
<td>AgSnIn</td>
<td>REL-OR-24AC/2X21 2834245 10</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>REL-OR-120AC/2X21 2834258 10</td>
</tr>
<tr>
<td>250 V AC/DC</td>
<td>REL-OR-230AC/2X21 2834261 10</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>REL-OR-230AC/2X21 2834260 10</td>
</tr>
<tr>
<td>1 V</td>
<td>10 mA</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>REL-OR-230AC/2X21 2834260 10</td>
</tr>
<tr>
<td>10 A (N/O contact)</td>
<td>REL-OR-230AC/2X21 2834260 10</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>REL-OR-230AC/2X1 2834300 10</td>
</tr>
<tr>
<td>10 mA</td>
<td>10 mA</td>
</tr>
<tr>
<td>Max. interrupting rating, ohmic load</td>
<td>REL-OR-230AC/2X1 2834300 10</td>
</tr>
<tr>
<td>250 VA</td>
<td>2500 VA</td>
</tr>
</tbody>
</table>

### General data

- **Test voltage (winding / contact)**: 2.5 kV AC (50 Hz, 1 min.)
- **Ambient temperature (operation)**: -40°C ... 60°C
- **Nominal operating mode**: 100% operating factor
- **Mechanical service life**: 10 x 10⁴ cycles
- **Electrical service life**: See diagram
- **Standards/regulations**: IEC 60664
- **Mounting position/mounting**: Any / On relay base PR3

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in octal relay with power contacts, with a test button and mechanical switch position indicator</td>
<td>REL-OR-24DC/2X21 2834232 10</td>
<td>REL-OR-24DC/3X21 2834274 10</td>
</tr>
</tbody>
</table>
**REL-OR...2x21 (2 PDTs)**

**Interruption rating**

- AC, ohmic load
- DC, ohmic load

**Electrical service life**

- 250V AC, ohmic load
- 120VDC, ohmic load
- 28V DC, ohmic load

**Service life reduction factor with various cos phi**

**REL-OR...3x21 (3 PDTs)**

**Interruption rating**

- AC, ohmic load
- DC, ohmic load

**Electrical service life**

- 250V AC, ohmic load
- 120VDC, ohmic load
- 28V DC, ohmic load

**Service life reduction factor with various cos phi**
Plug-in octal relays for high DC loads

Plug-in octal relays with two N/O contacts connected in series suitable for PR3 and RIF-3 relay bases.

The relays are specially designed for switching high DC loads.

Further advantages:
- Full shutdown by means of 2 x 1.7 mm contact opening
- With lockable manual operation
- Integrated status LED
- Integrated freewheeling diode with DC types

### Technical Data

#### Input Data
- Permissible range (with reference to $U_{in}$)
- Typ. input current at $U_{in}$: 14 mA
- Typ. response time at $U_{in}$: 20 ms
- Typ. release time at $U_{in}$: 30 ms

#### Output Data
- Contact type: Single contact, 1 N/O contact (series connection, 2 N/O contacts)
- Contact material: AgNi
- Max. switching voltage: 250 V AC / 220 V DC
- Min. switching voltage: 10 V (at 10 mA)
- Limiting continuous current: 10 A
- Min. switching current: 10 mA (at 10 V)
- Max. interrupting rating, ohmic load: 2500 VA

#### General Data
- Test voltage (winding / contact): 2.5 $U_{in}$, (50 Hz, 1 min.)
- Ambient temperature (operation): -40°C ... 60°C
- Nominal operating mode: 100% operating factor
- Mechanical service life: Approx. 10^7 cycles
- Standards/regulations: IEC 61810, EN 60947
- Mounting position/mounting: Any / On relay base PR3

#### Ordering Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_{in}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in octal relay for high DC loads</td>
<td>24 V DC, 110 V DC, 220 V DC, 120 V AC, 230 V AC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-OR/LDP-24DC/1/MB</td>
<td>2901901</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/LDP-110DC/1/MB</td>
<td>2901902</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/LDP-220DC/1/MB</td>
<td>2901904</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/L-24AC/1/MB</td>
<td>2901905</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/L-120AC/1/MB</td>
<td>2901906</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/L-230AC/1/MB</td>
<td>2901907</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-OR/LDP-24DC/1</td>
<td>2901908</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/LDP-110DC/1</td>
<td>2901909</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/LDP-220DC/1</td>
<td>2901910</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/L-24AC/1</td>
<td>2901911</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/L-120AC/1</td>
<td>2901912</td>
<td>10</td>
</tr>
<tr>
<td>REL-OR/L-230AC/1</td>
<td>2901913</td>
<td>10</td>
</tr>
</tbody>
</table>

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
REL-OR.../1/MB (1 N/O contact with blow magnet)

Operating voltage range of the relay

DC interrupting rating

1. Maximum operating voltage without load current (0 A)
2. Maximum operating voltage at limiting continuous current (10 A)
3. Minimum pick-up voltage without pre-excitation

REL-OR.../1 (1 N/O contact)

Operating voltage range of the relay

DC interrupting rating

1. Maximum operating voltage without load current (0 A)
2. Maximum operating voltage at limiting continuous current (10 A)
3. Minimum pick-up voltage without pre-excitation

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
## Relay modules

### PR series

### Input modules/interference suppression modules for PR1, PR2, and PR3

Plug-in input modules/interference suppression modules for optional fitting of PR... relay base

- Attenuation of reverse voltage induced in coil
- Mechanical coding to protect against incorrect connection

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs./Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in module, for mounting on PR..., with LED status indicator and freewheeling diode to limit the coil induction voltage effectively, polarity: A1 +, A2 –, Input voltage:</td>
<td>LDP-12-24DC</td>
<td>2833657</td>
<td>10</td>
</tr>
<tr>
<td>- 12-24 V DC ±20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 48-60 V DC ±20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 110 V DC ±20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plug-in module, for mounting on PR..., with LED status indicator and freewheeling diode to limit the coil induction voltage effectively, polarity: A1 –, A2 + (Japanese standard), Input voltage:</td>
<td>LDP-12-24DC</td>
<td>2833686</td>
<td>10</td>
</tr>
<tr>
<td>- 12-24 V DC ±20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 48-60 V DC ±20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 110 V DC ±20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plug-in module, for mounting on PR..., with varistor to limit the coil induction voltage and/or external interference peaks, Input voltage:</td>
<td>LV-12-24UC</td>
<td>2833712</td>
<td>10</td>
</tr>
<tr>
<td>- 12-24 V AC/DC ±20% (30-V-varistor)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 48-60 V AC/DC ±20% (75-V-varistor)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 120-230 V AC/110 V DC ±20% (275-V-varistor)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plug-in module, for mounting on PR..., with RD-element to attenuate the coil induction voltage and/or external interference peaks, Input voltage:</td>
<td>RC-12-24UC</td>
<td>2833741</td>
<td>10</td>
</tr>
<tr>
<td>- 12-24 V AC/DC ±20% (220 nF/100 Ω)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 48-60 V AC/DC ±20% (220 nF/220 Ω)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 120-230 V AC/DC ±20% (100 nF/470 Ω)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The relay bases of the PR1 series can also be equipped with wear-free solid-state relays (OPT... or SIM-EI...) as an alternative to the electromechanical relay.

LDP... and LV... plug-in modules cannot be used in conjunction with SIM-EI..., solid-state relays.
**Relay modules**

### PR series

**Fully mounted PR1 relay modules with screw connection**

Fully mounted PR1 relay modules, consisting of:
- Relay base
- 1/2 PDT relay
- Relay retaining bracket
- Input module interferenace suppr. module
- Marking labels

The advantages:
- Logical contact arrangement thanks to 1/3-level relay base
- Operational reliability thanks to sealed relay
- Safe isolation between coil and contact side

---

**Notes:**

Type of housing:
Polyamide fiber reinforced PA-F, color: green.

For the protection of input and output, inductive loads must be dampened with an effective protection circuit.

If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. The relay can be used for a shorter service life than with a pure power contact.

Other input voltages on request.

1) EMC: Class A product, see page 571

---

**Technical data**

<table>
<thead>
<tr>
<th>Input data</th>
<th>Output data</th>
<th>General data</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>24 V AC</td>
<td>4 kV (50 Hz, 1 min.)</td>
</tr>
<tr>
<td>120 V AC</td>
<td>230 V AC</td>
<td>25°C ... 60°C</td>
</tr>
<tr>
<td>See diagram</td>
<td>See diagram</td>
<td>Nominal operating mode 100% operating factor</td>
</tr>
<tr>
<td>19</td>
<td>9 / 7</td>
<td>Service life, electrical</td>
</tr>
<tr>
<td>34 / 26</td>
<td>6 / 5.5</td>
<td>Service life, electrical</td>
</tr>
<tr>
<td>8</td>
<td>3 ... 12</td>
<td>Standards/regulations</td>
</tr>
<tr>
<td>Typ. response time at U_{in} [ms]</td>
<td>Min. switching current [mA]</td>
<td></td>
</tr>
<tr>
<td>3 ... 12</td>
<td>100 mA (at 10 mA)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>50 mA</td>
<td>Pollution degree/surge voltage category</td>
</tr>
<tr>
<td>24 V DC</td>
<td>12 V (at 10 mA)</td>
<td></td>
</tr>
<tr>
<td>24, 120, 230 V AC</td>
<td>30 V AC / 36 V DC</td>
<td></td>
</tr>
<tr>
<td>Input protection: 24 V DC</td>
<td>Limiting continuous current [mA]</td>
<td></td>
</tr>
<tr>
<td>19 [mA]</td>
<td>100 mA (at 10 mA)</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>50 mA</td>
<td></td>
</tr>
<tr>
<td>9 / 7</td>
<td>30 A (300 ms)</td>
<td></td>
</tr>
<tr>
<td>6 / 5.5</td>
<td>50 mA</td>
<td></td>
</tr>
<tr>
<td>3 ... 12</td>
<td>2500 VA (for 250 V AC)</td>
<td></td>
</tr>
<tr>
<td>3 ... 12</td>
<td>30 V AC / 36 V DC</td>
<td></td>
</tr>
<tr>
<td>3 ... 12</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1 mA (at 24 V)</td>
<td></td>
</tr>
<tr>
<td>1.5 ... 14</td>
<td>2 ... 22</td>
<td></td>
</tr>
<tr>
<td>1.5 ... 16</td>
<td>3000 VA (for 250 V AC)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>For more data, see diagram</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>3 ... 12</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>3 ... 12</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Input voltage U_{in}</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR1-RSC3-LDP-24DC/21AU</td>
<td>Pre-assembled coupling relay modules with miniature power contact relay</td>
<td>24 V DC</td>
<td>2834326</td>
<td>5</td>
</tr>
<tr>
<td>PR1-RSC3-LV-24AC/21AU</td>
<td>24 V AC</td>
<td>2834339</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PR1-RSC3-LV-230AC/21AU</td>
<td>230 V AC</td>
<td>2834342</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PR1-RSC3-LDP-24DC/21AU</td>
<td>Pre-assembled coupling relay modules with multi-layer contact relay</td>
<td>24 V DC</td>
<td>2834355</td>
<td>5</td>
</tr>
<tr>
<td>PR1-RSC3-LV-24AC/21AU</td>
<td>24 V AC</td>
<td>2834368</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PR1-RSC3-LV-230AC/21AU</td>
<td>230 V AC</td>
<td>2834371</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PR1-RSC3-LV-120AC/21AU</td>
<td>120 V AC</td>
<td>2834384</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PR1-RSC3-LV-230AC/21AU</td>
<td>230 V AC</td>
<td>2834397</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device marking label, for thermal transfer printer, labeling surface 6 x 15 mm</td>
<td>EML (15X6) R YE</td>
<td>0819288</td>
</tr>
</tbody>
</table>

---

**PHOENIX CONTACT**

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
**PR1-RSC3.../2 (1 PDT)**

**Operating voltage range of the relay**

- DC coils
- AC coils

**Interruption rating**

- AC, ohmic load
- DC, ohmic load
- DC, L/R = 40 ms

**Service life reduction factor**

- Electrical service life

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pos. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR1-RSC3.../2 (1 PDT)</td>
<td>2434481</td>
<td>5</td>
</tr>
<tr>
<td>PR1-RSC3.../4 (2 PDT)</td>
<td>2434491</td>
<td>5</td>
</tr>
<tr>
<td>PR1-RSC3.../6 (3 PDT)</td>
<td>2434504</td>
<td>5</td>
</tr>
<tr>
<td>PR1-RSC3.../10 (5 PDT)</td>
<td>2434517</td>
<td>5</td>
</tr>
<tr>
<td>PR1-RSC3.../12 (6 PDT)</td>
<td>2434520</td>
<td>5</td>
</tr>
<tr>
<td>PR1-RSC3.../15 (15 PDT)</td>
<td>2434533</td>
<td>5</td>
</tr>
<tr>
<td>PR1-RSC3.../19 (19 PDT)</td>
<td>2434546</td>
<td>5</td>
</tr>
<tr>
<td>PR1-RSC3.../21 (21 PDT)</td>
<td>2434559</td>
<td>5</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EML (15X6) R YE</td>
<td>0819288</td>
</tr>
</tbody>
</table>

For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
Relay modules

PR series

Fully mounted PR1 relay modules with spring-cage connection

Fully mounted PR1 relay modules, consisting of:
- Relay base
- 1/2 PDT relay
- Relay retaining bracket
- Input module/interference suppr. module
- Marking labels

The advantages:
- Logical contact arrangement thanks to 1/3-level relay base
- Operational reliability thanks to sealed relay
- Safe isolation between coil and contact side

Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>Permissible range (with reference to $U_{N}$)</th>
<th>[mA]</th>
<th>Typ. input current with $U_{N}$ (for AC: 50/60 Hz)</th>
<th>[mA]</th>
<th>Typ. response time at $U_{N}$</th>
<th>[ms]</th>
<th>Input protection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>24 V AC</td>
<td>19</td>
<td>34 / 26</td>
<td>34 / 26</td>
<td>8</td>
<td>3...12</td>
<td>24 V DC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11</td>
<td></td>
<td>11</td>
<td></td>
<td></td>
<td>24 V DC</td>
</tr>
</tbody>
</table>

Output data

<table>
<thead>
<tr>
<th>Contact type</th>
<th>Contact material</th>
<th>Maximum switching voltage</th>
<th>Minimum switching voltage</th>
<th>Limiting continuous current</th>
<th>Maximum inrush current</th>
<th>Min. switching current</th>
<th>Interrupting rating (ohmic load) max.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AgNi</td>
<td>250 V AC/DC</td>
<td>12 V (at 10 mA)</td>
<td>10 A</td>
<td>30 A (300 ms)</td>
<td>100 mA</td>
<td>2500 VA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

General data

<table>
<thead>
<tr>
<th>Test voltage</th>
<th>Winding to contact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contact/contact</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient temperature (operation)</th>
<th>25°C...60°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal operating mode</td>
<td>100% operating factor</td>
</tr>
<tr>
<td>Mechanical service life</td>
<td>3 x 10³ cycles</td>
</tr>
<tr>
<td>Service life, electrical</td>
<td>See diagram</td>
</tr>
<tr>
<td>Standards/Regulations</td>
<td>IEC 60064, EN 50178, IEC 62103</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category</td>
<td>3 / III</td>
</tr>
<tr>
<td>Mounting position / Mounting</td>
<td>Any / in rows with zero spacing</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
<td>0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16</td>
</tr>
<tr>
<td>Dimensions</td>
<td>W / H / D</td>
</tr>
<tr>
<td></td>
<td>16 mm / 97 mm / 72 mm</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_{N}$</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-assembled coupling relay modules with miniature power contact relay</td>
<td>24 V DC</td>
<td>PR1-RSP3-LDP-24DC/21(1)</td>
<td>2834407</td>
</tr>
<tr>
<td></td>
<td>24 V AC</td>
<td>PR1-RSP3-LV-24AC/21(1)</td>
<td>2834410</td>
</tr>
<tr>
<td></td>
<td>230 V AC</td>
<td>PR1-RSP3-LV-230AC/21(1)</td>
<td>2834436</td>
</tr>
<tr>
<td>Pre-assembled coupling relay modules with multi-layer contact relay</td>
<td>24 V DC</td>
<td>PR1-RSP3-LDP-24DC/21AU(1)</td>
<td>2834449</td>
</tr>
<tr>
<td></td>
<td>24 V AC</td>
<td>PR1-RSP3-LV-24AC/21AU(1)</td>
<td>2834452</td>
</tr>
<tr>
<td></td>
<td>120 V AC</td>
<td>PR1-RSP3-LV-120AC/21AU(1)</td>
<td>2834465</td>
</tr>
<tr>
<td></td>
<td>230 V AC</td>
<td>PR1-RSP3-LV-230AC/21AU(1)</td>
<td>2834478</td>
</tr>
</tbody>
</table>

Device marking label, for thermal transfer printer, labeling surface 6 x 15 mm

Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EML (15X6) RE YE</td>
<td>0819288</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes:

- Type of housing: Polyamide fiber reinforced PA-F, color: green.
- For the protection of input and output, inductive loads must be dampened with an effective protection circuit.
- If the specified maximum values for multi-layer contact relays are exceeded, the gold plating is destroyed. The maximum values of the power contact relay are then valid. This can result in a shorter service life than with a pure power contact.
- There is a double spring-cage for each terminal point.
- Other input voltages on request.
- 1) EMC: Class A product, see page 571

For more data, see diagram

For more data, see diagram
**PR1-RSP3.../21 (1 PDT)**

Operating voltage range of the relay

![Graph showing operating voltage range of the relay](image)

**Technical data**

<table>
<thead>
<tr>
<th>24 V DC</th>
<th>24 V AC</th>
<th>120 V AC</th>
<th>230 V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>See diagram</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>34 / 26</td>
<td>9 / 7</td>
<td>6 / 5.5</td>
</tr>
<tr>
<td>8</td>
<td>3 ... 12</td>
<td>3 ... 12</td>
<td>3 ... 12</td>
</tr>
<tr>
<td>10</td>
<td>1.5 ... 14</td>
<td>1.5 ... 16</td>
<td>2 ... 22</td>
</tr>
</tbody>
</table>

- Damping diode, Yellow LED
- Varistor, Yellow LED

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR1-RSP3-LDP-24DC/2X21'</td>
<td>2834562</td>
</tr>
<tr>
<td>PR1-RSP3-LV-24AC/2X21'</td>
<td>2834575</td>
</tr>
<tr>
<td>PR1-RSP3-LV-120AC/2X21'</td>
<td>2834588</td>
</tr>
<tr>
<td>PR1-RSP3-LV-230AC/2X21'</td>
<td>2834591</td>
</tr>
<tr>
<td>PR1-RSP3-LDP-24DC/2X21AU</td>
<td>2834601</td>
</tr>
<tr>
<td>PR1-RSP3-LV-24AC/2X21AU</td>
<td>2834614</td>
</tr>
<tr>
<td>PR1-RSP3-LV-120AC/2X21AU</td>
<td>2834627</td>
</tr>
<tr>
<td>PR1-RSP3-LV-230AC/2X21AU</td>
<td>2834630</td>
</tr>
</tbody>
</table>

**Accessories**

| EML (15X6) R YE | 0819288 |

For additional information, visit [www.phoenixcontact.net/products](http://www.phoenixcontact.net/products)
**Relay modules**

### PR series

#### Fully mounted PR2 relay modules

Fully mounted PR2 relay modules, consisting of:
- Relay base
- 2/4 PDT relay
- Relay retaining bracket
- Input module/interference suppr. module (AC types only)
- Marking labels
The advantages:
- Relay with lockable manual operation and status LED
- With DC types, freewheeling diode is integrated into relay
- Mechanical switch position indicator
- Logical contact arrangement thanks to 1/3-level relay base
- Screw or spring-cage connection
- 4 PDT types with multi-layer gold contacts

#### Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>Output data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Permissible range</strong> with reference to $U_n$</td>
<td><strong>Contact type</strong></td>
</tr>
<tr>
<td>Typ. input current with $U_n$ for AC: 50/60 Hz</td>
<td><strong>Contact material</strong></td>
</tr>
<tr>
<td>Typ. response time at $U_n$</td>
<td>Maximum switching voltage</td>
</tr>
<tr>
<td>Typ. release time at $U_n$</td>
<td>Minimum switching voltage</td>
</tr>
<tr>
<td>Input protection</td>
<td>Limiting continuous current</td>
</tr>
<tr>
<td>24 V DC</td>
<td>Maximum inrush current</td>
</tr>
<tr>
<td>24, 120, 230 V AC</td>
<td>Min. switching current</td>
</tr>
<tr>
<td><strong>Typ. release time at $U_n$</strong></td>
<td>Interrupting rating (ohmic load) max.</td>
</tr>
<tr>
<td>[mA]</td>
<td>5 A</td>
</tr>
<tr>
<td>3 ... 12</td>
<td>250 VA / 125 V DC</td>
</tr>
<tr>
<td>5</td>
<td>1250 VA</td>
</tr>
<tr>
<td>3 ... 12</td>
<td>2500 VA</td>
</tr>
</tbody>
</table>

#### General data

<table>
<thead>
<tr>
<th>Test voltage</th>
<th>Winding to contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 kV (50 Hz, 1 min.)</td>
<td>Contact/contact</td>
</tr>
<tr>
<td>250 V AC / 125 V DC</td>
<td></td>
</tr>
<tr>
<td>5 V</td>
<td></td>
</tr>
<tr>
<td>10 A</td>
<td></td>
</tr>
<tr>
<td>20 A (15 ms)</td>
<td></td>
</tr>
<tr>
<td>1 mA</td>
<td></td>
</tr>
<tr>
<td>2500 VA</td>
<td></td>
</tr>
<tr>
<td>27 mm / 78.5 mm / 86 mm</td>
<td></td>
</tr>
</tbody>
</table>

#### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_n$</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-assembled coupling relay modules with 2-PDT contact relay</td>
<td>120 V AC</td>
<td>PR2-RSC3-LDP-24DC2X211)</td>
<td>2834643</td>
</tr>
<tr>
<td>Pre-assembled coupling relay modules with 4-PDT contact relay and additional hard gold-plating</td>
<td>24 V DC</td>
<td>PR2-RSC3-LV-120AC/4X21AU1)</td>
<td>2834724</td>
</tr>
</tbody>
</table>

#### Accessories

| Device marking label, for thermal transfer printer, labeling surface 6 x 15 mm | EML (15X6) | ROCHE 20819288 | 1 |

---

1) **EMC**: Class A product, see page 571
### Relay modules

#### PR series

**PR2-RS.../2x21 (2 PDT)**

- **Operating voltage range of relay $T_c=T_{coil}$**
- **AC interrupting rating**

![Graph showing AC interrupting rating](image)

**DC interrupting rating**

![Graph showing DC interrupting rating](image)

**Electrical service life**

![Graph showing electrical service life](image)

- **Switching current**
- **Switching voltage**
- **Min. switching current**
- **Maximum switching voltage**
- **Contact material**
- **Limiting continuous current**
- **Maximum inrush current**

**Technical data**

- 24 V DC, 24 V AC, 120 V AC, 230 V AC
- Operating voltage range of relay: $U_1=U_{coil}$
- AC interrupting rating
- DC interrupting rating
- Electrical service life

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs./Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR2-RS3-LDP-24DC/2X21'</td>
<td>2834685</td>
<td>5</td>
</tr>
<tr>
<td>PR2-RS3-LV-24AC/2X21'</td>
<td>2834698</td>
<td>5</td>
</tr>
<tr>
<td>PR2-RS3-LV-125AC/2X21'</td>
<td>2834708</td>
<td>5</td>
</tr>
<tr>
<td>PR2-RS3-LV-230AC/2X21'</td>
<td>2834711</td>
<td>5</td>
</tr>
<tr>
<td>PR2-RS3-LDP-24DC/4X21AU²</td>
<td>2834766</td>
<td>5</td>
</tr>
<tr>
<td>PR2-RS3-LV-24AC/4X21AU²</td>
<td>2834779</td>
<td>5</td>
</tr>
<tr>
<td>PR2-RS3-LV-125AC/4X21AU²</td>
<td>2834782</td>
<td>5</td>
</tr>
<tr>
<td>PR2-RS3-LV-230AC/4X21AU²</td>
<td>2834795</td>
<td>5</td>
</tr>
</tbody>
</table>

**Accessories**

| EML (15X6) R YE | 0819288 | 1 |

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**For additional information, visit [www.phoenixcontact.net/products](http://www.phoenixcontact.net/products).**
The Phoenix Contact DEK interface terminal blocks provide complete interface functions in modular terminal block housing that is just 6.2 mm wide. In conjunction with standard terminal block accessories, these high-capacity interfaces have not only the design but also the high level of user convenience of modular terminal blocks.

The main common feature of all Phoenix Contact interface terminal blocks is their width of just 6.2 mm. This saves 60% space in the control cabinet in comparison to conventional 15 mm wide coupling relays from modular systems.

The DEK range offers the best solution for all industrial voltages both for signal input and output.

High switching capacities are a matter of course for the DEK-REL... relay terminal block and the DEK-OV... solid-state relay terminal block.

The wear-free DEK-OV... power solid-state relay terminal block is used for applications that require a greater switching frequency in which electromechanical relays reach the end of their service life in a short time.

Integrated LEDs clearly indicate the switching status of the electronic terminal blocks and provide an excellent overview of the coupling level and the system.

Colored EB-DIK insertion bridges for the supply and ground signals make it possible to design the circuit simply and effectively.

Integrated protective circuits such as freewheeling diodes, polarity reversal protection diodes, and surge protection elements protect the coupling modules and ensure optimum availability of the system.
### DEK-REL-... relay terminal block

The Phoenix Contact relay terminal block with PDT contact offers the following advantages:

- Width of only 6.2 mm
- High switching capacity of 250 V AC/6 A
- Less storage, since PDT, N/O or N/C contacts can be wired
- Little wiring expense due to the use of EB-DIK insertion bridges
- IP67 protected relay housing
- Cadmium-free relay contacts
- 4 kV electrical isolation of input and output
- Safe isolation according to DIN EN 50178 (VDE 0160)
- Light indicator for signaling the switching status.

### Technical data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of housing:</td>
<td>Polyamide PA non-reinforced, color: green.</td>
</tr>
<tr>
<td>Marking systems and mounting material</td>
<td>See Catalog 5</td>
</tr>
<tr>
<td>For the protection of relay coils and contacts, inductive loads must be dampened with an efficient protection circuit.</td>
<td></td>
</tr>
<tr>
<td>For further EB...DIK... insertion bridges, refer to page 403</td>
<td></td>
</tr>
<tr>
<td>1) EMC: Class A product, see page 571</td>
<td></td>
</tr>
</tbody>
</table>

#### Input data

- Permissible range (with reference to $U_N$)
- Typ. input current at $U_N$ [mA]
- Response/release time at $U_N$ [ms]
- Input protection:

#### Output data

- Contact type: Single contact, 1-PDT
- Contact material: AgSnO
- Max. switching voltage: 250 V AC/DC
- Min. switching voltage: 12 V AC/DC
- Limiting continuous current: 6 A
- Max. inrush current: 6 A
- Min. switching current: 10 mA
- Max. interrupting rating, ohmic load:
  - 24 V DC: 140 W
  - 48 V DC: 20 W
  - 60 V DC: 18 W
  - 110 V DC: 23 W
  - 220 V DC: 40 W
  - 250 V AC: 1500 VA

#### General data

- Test voltage (winding / contact): 4 kV AC (50 Hz, 1 min.)
- Ambient temperature (operation): -20°C ... 50°C
- Mechanical service life: Approx. 10^7 cycles
- Standards/regulations: IEC 60664, EN 50178, IEC 62103
- Connection data solid / stranded / AWG: 0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14
- Dimensions: W / H / D: 6.2 mm / 80 mm / 56 mm

#### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_N$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay terminal block with power relay</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Cover</td>
<td></td>
</tr>
<tr>
<td>Insertion bridge, for middle and lower levels</td>
<td>No. of pos.</td>
</tr>
<tr>
<td></td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>80</td>
</tr>
</tbody>
</table>

#### Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover D-DEK 1,5 GN</td>
<td>2716949</td>
<td>10</td>
</tr>
<tr>
<td>Insertion bridge, for middle and lower levels</td>
<td>Color</td>
<td></td>
</tr>
<tr>
<td>EB 80- DIK BU</td>
<td>26 A</td>
<td>2715940</td>
</tr>
<tr>
<td>EB 80- DIK RD</td>
<td>26 A</td>
<td>2715953</td>
</tr>
<tr>
<td>EB 80- DIK WH</td>
<td>26 A</td>
<td>2715788</td>
</tr>
</tbody>
</table>

For additional information, visit www.phoenixcontact.net/products

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DEK series

DEK-REL-24/1/SEN input interface and DEK-REL-24/1/AKT output interface

In addition to the familiar advantages of the DEK-REL... electronic terminal blocks, such as
- 2-layer contact with hard gold-plating for universal applications from 1 mA to 5 A continuous current
- 2 kV$_{\text{rms}}$ electrical isolation of input and output
- Integrated input circuit

With this terminal block, “ALL” connections for a sensor or actuator are provided over a width of just 6.2 mm!

This means that 16 outputs take up a total constructional width of just 105.4 mm (including the power terminal block).

Advantages:
- Lower costs as the N terminal block is no longer required
- Wiring is reduced to a minimum
- Up to 73% more space

Technical data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_{\text{IN}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) EMC: Class A product, see page 571</td>
<td></td>
</tr>
</tbody>
</table>

| Type of housing: Polyamide PA non-reinforced, color: green. |
| Marking systems and mounting material See Catalog 5 |

For the protection of relay coils and contacts, inductive loads must be dampened with an efficient protection circuit.

For further EB...DIK... insertion bridges, refer to page 403

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEK-REL- 5/6(1)</td>
<td>2941183</td>
<td>10</td>
</tr>
<tr>
<td>DEK-REL- 24/6(1)</td>
<td>2940171</td>
<td>10</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage $U_{\text{IN}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-DEK 1,5 GN</td>
<td>2716949</td>
</tr>
</tbody>
</table>

Terminal block, with three through contacts, for mounting on NS 35...
For busbar feeding
Cover

Pin configuration, DEK-REL-...SEN

Pin configuration, DEK-REL-...AKT

Notes:

- Input data
  - Permissible range (with reference to $U_{\text{IN}}$)
    - UN
  - Typ. input current at $U_{\text{IN}}$ [mA]
    - UN
  - Response/release time at $U_{\text{IN}}$ [ms]
    - UN
  - Input protection: Yellow LED, Bridge rectifier

- Output data
  - Contact type Double contact, 1 N/O contact
  - Contact material AgNi, hard gold-plated
  - Max. switching voltage 250 V AC / 125 V DC
  - Min. switching voltage 0.1 V
  - Limiting continuous current 3 A (5 A up to 35°C at 24 V DC)
  - Max. inrush current 5 A
  - Min. switching current 1 mA
  - Max. interrupting rating, ohmic load
    - 24 V DC: 72 W
    - 48 V DC: 60 W
    - 60 V DC: 50 W
    - 110 V AC: 50 W
    - 250 V AC: 750 VA

- General data
  - Test voltage (winding / contact) 2 kV AC (50 Hz, 1 min.)
  - Ambient temperature (operation) -20°C ... 50°C
  - Mechanical service life Approx. 2 x 10$^7$ cycles
  - Connection data solid / stranded / AWG 0.2 - 2.5 mm$^2$ / 0.2 - 2.5 mm$^2$ / 24 - 14
  - Dimensions W / H / D 6.2 mm / 80 mm / 56 mm

- Standards/regulations IEC 60664, EN 50178, IEC 62103

- Connection data solid / stranded / AWG 0.2 - 2.5 mm$^2$ / 0.2 - 2.5 mm$^2$ / 24 - 14

- Cover D-DEK 1,5 GN 2716949

- Insertion bridge, for middle and lower levels
  - No. of pos. Color
    - 80 blue
    - 80 red
    - 80 white

For small to medium loads
1 N/O contact (1)
### Relay modules
#### DEK series

For small to medium loads  
1 N/O contact (1)

---

**Technical data**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9 - 0.8 - 1.1</td>
<td>1.1</td>
<td>6.5</td>
</tr>
<tr>
<td>23</td>
<td>6.5</td>
<td>5/15</td>
</tr>
</tbody>
</table>

Yellow LED, Bridge rectifier

Double contact, 1 N/O contact  
AgNi, hard gold-plated  
250 V AC / 125 V DC  
0.1 V  
3 A (5 A up to 35°C at 24 V DC)  
5 A  
1 mA

72 W  
60 W  
50 W  
50 W  
750 VA

2 kV AC (50 Hz, 1 min.)  
-20°C... 50°C  
Approx. 2 x 10^7 cycles  
IEC 60964, EN 50178, IEC 62103  
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14  
6.2 mm / 80 mm / 56 mm

---

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
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**Accessories**

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<tbody>
<tr>
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<td>D-DEK 1,5 GN</td>
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<tr>
<td>EB 80- DIK BU</td>
<td>26 A</td>
<td>2715940</td>
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<tr>
<td>EB 80- DIK RD</td>
<td>26 A</td>
<td>2715953</td>
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<tr>
<td>EB 80- DIK WH</td>
<td>26 A</td>
<td>2715788</td>
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**Technical data**

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<tr>
<td>0.8 - 1.1</td>
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<td>5/15</td>
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</table>

Yellow LED, Bridge rectifier

Double contact, 1 N/O contact  
AgNi, hard gold-plated  
250 V AC / 125 V DC  
0.1 V  
3 A (5 A up to 35°C at 24 V DC)  
5 A  
1 mA

72 W  
60 W  
50 W  
50 W  
750 VA

2 kV AC (50 Hz, 1 min.)  
-20°C... 50°C  
Approx. 2 x 10^7 cycles  
IEC 60964, EN 50178, IEC 62103  
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14  
6.2 mm / 80 mm / 56 mm

---

**Ordering data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
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<tbody>
<tr>
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**Accessories**

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<td>EB 80- DIK WH</td>
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**Technical data**

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<td>6.5</td>
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</table>

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72 W  
60 W  
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750 VA

2 kV AC (50 Hz, 1 min.)  
-20°C... 50°C  
Approx. 2 x 10^7 cycles  
IEC 60964, EN 50178, IEC 62103  
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14  
6.2 mm / 80 mm / 56 mm

---

**Ordering data**

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</tr>
<tr>
<td>D-DEK 1,5 GN</td>
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<td>10</td>
</tr>
<tr>
<td>EB 80- DIK BU</td>
<td>26 A</td>
<td>2715940</td>
</tr>
<tr>
<td>EB 80- DIK RD</td>
<td>26 A</td>
<td>2715953</td>
</tr>
<tr>
<td>EB 80- DIK WH</td>
<td>26 A</td>
<td>2715788</td>
</tr>
</tbody>
</table>

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For additional information, visit www.phoenixcontact.net/products
Relay modules

DEK series

DEK-OE... and DEK-OV... solid-state relay terminal blocks

Phoenix Contact DEK-OE and DEK-OV interface terminal blocks are only 6.2 mm wide but still provide a complete input or output interface with:
- Electrical isolation between input and output at up to 2.5 kVrms
- Integrated input circuit
- Status display
- EB-DIK insertion bridges
- Labeling and mounting with modular terminal block convenience
- Wear-free switching up to 24 V DC/10 A and 240 V AC/800 mA
- Integrated output protection circuit
- Zero voltage switch at AC output
- Actuator version available.

Notes:
Type of housing:
Polyamide PA non-reinforced, color: green.
Marking systems and mounting material
See Catalog S
For the protection of input and output, inductive loads must be dampeden with an effective protection circuit.
For further EB...DIK... insertion bridges, refer to page 403
1) EMC: Class A product, see page 571

Technical data

<table>
<thead>
<tr>
<th>Type Order No.</th>
<th>Pcs. / Pkt.</th>
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<td>DEK-OE-12DC/48DC/100</td>
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<tr>
<td>DEK-OE-24DC/48DC/100</td>
<td>2840207</td>
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<tr>
<td>DEK-OE-60DC/48DC/100</td>
<td>2841536</td>
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<tr>
<td>DEK-OE-120AC/48DC/100</td>
<td>2841599</td>
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<td>DEK-OE-230AC/48DC/100</td>
<td>2840210</td>
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Ordering data

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<thead>
<tr>
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<td>DEK-OE-230AC/48DC/100</td>
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Accessories

- EB 80-DIK BU 26 A 2715940 1
- EB 80-DIK RD 26 A 2715953 1
- EB 80-DIK WH 26 A 2715798 1

PHOENIX CONTACT

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
### Relay modules

**DEK series**

![DEK-OV.../24DC/3](image)

**with DC voltage output**

- max. = 3 A

![DEK-OV.../24DC/3/AKT](image)

**with AC voltage output**

- max. = 800 mA

### Technical data

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
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<td>V DC</td>
<td>30</td>
</tr>
<tr>
<td>1.2</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>≤0.8</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>≤0.4</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>300</td>
<td>A DC</td>
<td>30</td>
</tr>
</tbody>
</table>

### Input circuit

- DC Yellow LED, Protection against polarity reversal
- Yellow LED, Protection against polarity reversal, Surge protection

### 3 V DC ... 30 V DC

- Protection against polarity reversal, Surge protection ≤0.2 V

### Technical data

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td>V DC</td>
<td>30</td>
</tr>
<tr>
<td>1.2</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>≤0.8</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>≤0.4</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>300</td>
<td>A DC</td>
<td>30</td>
</tr>
</tbody>
</table>

### 5 V DC ... 30 V DC

- Protection against polarity reversal, Surge protection ≤0.2 V

### Technical data

<table>
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<tr>
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<th>Unit</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>1.2</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>≤0.8</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>≤0.4</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td>A DC</td>
<td>30</td>
</tr>
<tr>
<td>300</td>
<td>A DC</td>
<td>30</td>
</tr>
</tbody>
</table>

### 10 V AC ... 25 V AC (50/60 Hz)

- Protection against polarity reversal, Surge protection ≤0.2 V

### Technical data

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
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<td>V AC</td>
<td>30</td>
</tr>
<tr>
<td>1.2</td>
<td>A AC</td>
<td>30</td>
</tr>
<tr>
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<td>A AC</td>
<td>30</td>
</tr>
<tr>
<td>≤0.4</td>
<td>A AC</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td>A AC</td>
<td>30</td>
</tr>
<tr>
<td>300</td>
<td>A AC</td>
<td>30</td>
</tr>
</tbody>
</table>

### Standards/regulations

- IEC 60664, EN 50178, IEC 62103
- 2 / III

### Connection data

- solid / stranded / AWG 0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14

### Dimensions

- W / H / D 6.2 mm / 80 mm / 56 mm

### Accessories

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
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<tbody>
<tr>
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<td>EB 80-DIK RD</td>
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<td>2715953</td>
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<tr>
<td>EB 80-DIK WH</td>
<td>26 A</td>
<td>2715788</td>
<td>1</td>
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</tbody>
</table>

For additional information, visit [www.phoenixcontact.net/products](http://www.phoenixcontact.net/products)
Relay modules
Special relays and solid-state relays

**DEK-REL-24/1/S switch/relay terminal block**

The functions “Manual”, “0”, “Automatic” are provided in a 6.2 mm narrow relay terminal block.

**Interference-free relay and solid-state relay interfaces**

Coupled interference voltages on the coil lines or leakage currents can cause malfunctions in conventional modules. These special interface modules, equipped with high switching thresholds and/or effective filters, ensure good functioning.

**ST-REL... and EMG 17-REL... relay interfaces for switching lamp loads**

Lamp loads and capacitive consumers produce extremely high inrush currents which weld conventional relay contacts. To prevent this, Phoenix Contact uses an arc-resistant contact optimized for these applications, which keeps these peaks under control.

**ST-OV 3-24DC/400/3 plug-in solid-state power relay**

The output of this component, dimensioned with a peak reverse voltage of 800 V, allows, for example, 230 V motors to be driven in simple reversible mode.

**Power circuit breaker solid-state relay, with signal logic**

These modules combine the features of a short-circuit-proof power solid-state relay and those of a thermomagnetic protection element.

**DEK-OE-...100KHZ 100 kHz input solid-state relay**

Input solid-state relay for reliable transmission of high frequency signals of the type that occur with, for example, incremental encoders.

**Electronic sensor terminal block for NAMUR proximity sensors**

For converting the changeable resistance of a NAMUR sensor into a digital signal that can be read by a PLC.

**DEK-TR/INV inverter module**

Module for converting NPN outputs to PNP outputs and PNP to NPN.
Relay module with manual switch

Relay module with manual switch and integrated power relay for manual, zero, and automatic functions

The advantages:
- Max. switching current of 5 A
- Only 6.2 mm wide
- Increased contact stability thanks to double contact
- Safe isolation according to DIN EN 50178 between coil and contact

Notes:

<table>
<thead>
<tr>
<th>Input data</th>
<th></th>
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<tbody>
<tr>
<td>Permissible range (with reference to $U_{IN}$)</td>
<td>0.8 - 1.1</td>
</tr>
<tr>
<td>Typ. input current at $U_{IN}$ [mA]</td>
<td>6.5</td>
</tr>
<tr>
<td>Response/release time at $U_{IN}$ [ms]</td>
<td>5 / 15</td>
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<tr>
<td>Input protection:</td>
<td>Yellow LED, Bridge rectifier</td>
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<table>
<thead>
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<th>Output data</th>
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</thead>
<tbody>
<tr>
<td>Contact type</td>
<td>Double contact, 1 N/O contact</td>
</tr>
<tr>
<td>Contact material</td>
<td>AgNi, hard gold-plated</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>250 V AC / 125 V DC</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>0.1 V</td>
</tr>
<tr>
<td>Limiting continuous current</td>
<td>3 A (5 A up to 35°C at 24 V DC)</td>
</tr>
<tr>
<td>Max. inrush current</td>
<td>5 A</td>
</tr>
<tr>
<td>Min. switching current</td>
<td>1 mA</td>
</tr>
<tr>
<td>Max. interrupting rating, ohmic load</td>
<td></td>
</tr>
<tr>
<td>24 V DC</td>
<td>72 W</td>
</tr>
<tr>
<td>48 V DC</td>
<td>60 W</td>
</tr>
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<td>60 V DC</td>
<td>50 W</td>
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<tr>
<td>110 V DC</td>
<td>50 W</td>
</tr>
<tr>
<td>250 V AC</td>
<td>750 VA</td>
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General data

| Test voltage (winding / contact) | 2 kV AC (50 Hz, 1 min.) |
| Mechanical service life | -20°C ... 50°C |
| Standards/regulations | Approx. 2 x 10^7 cycles |
| Connection data solid / stranded / AWG | IEC 60664, EN 50178, IEC 62103 |
| 0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 14 |
| Dimensions | 6.2 mm / 61 mm |

Ordering data

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Cover

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<tr>
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</tr>
<tr>
<td>3</td>
<td>blue</td>
<td></td>
</tr>
<tr>
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Accessories

<table>
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<td>D-DEK 1.5 GN</td>
<td>2716949</td>
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</table>

For additional information, visit www.phoenixcontact.net/products

Relay module with power relay

Relay module with power relay and integrated relay

Technical data

Relay module with power relay and integrated relay

Relay module with power relay and integrated relay

Relay module with power relay and integrated relay

Relay module with power relay and integrated relay

Relay module with power relay and integrated relay

Relay module with power relay and integrated relay

Relay module with power relay and integrated relay

Relay module with power relay and integrated relay
Relay modules with interference current filter

Relay and solid-state relay modules with integrated filter to protect against interference voltages or currents due, for example, to long control lines.

The advantages:
- Resistant to interference currents
- High relay release voltage

Typical applications:
- Applications with long control lines
- Use of AC output boards, resulting in residual AC currents

| Notes: |
| Load current diagrams, see page 347 |

**Technical data**

<table>
<thead>
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<th>Input data</th>
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<td>Typ. input current at $U_{d}$ [mA]</td>
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<tr>
<td>Response/release time at $U_{d}$ [ms]</td>
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<tr>
<td>Input protection:</td>
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<thead>
<tr>
<th>Output data</th>
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<tr>
<td>Contact type</td>
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<tr>
<td>Contact material</td>
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<tr>
<td>Max. switching voltage</td>
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<tr>
<td>Limiting continuous current</td>
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<tr>
<td>Max. inrush current</td>
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<td>Max. interrupting rating, ohmic load</td>
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<td>Ambient temperature (operation)</td>
</tr>
<tr>
<td>Mechanical service life</td>
</tr>
<tr>
<td>Standards/regulations</td>
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<tr>
<td>Dimensions</td>
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</table>

**Ordering data**

| Description | Input voltage $U_{d}$ |
|----------------|
| Relay module with power contact relay | 24 V AC 120 V AC 230 V AC |
| Relay module with multi-layer contact relay | 24 V AC 120 V AC 230 V AC |
| Basic terminal block, complete with end cover | URELG 3 |

<table>
<thead>
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<th>Accessories</th>
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<tbody>
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<td>Equipment marker</td>
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<td>ST-REL3-KG120/21/AU/SO46</td>
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<td>ST-REL3-KG230/21/AU/SO46</td>
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<table>
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</thead>
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<td>EMG-22-REL/KSR-230/21/AU/SO46</td>
</tr>
<tr>
<td>EMG-GKS 12</td>
</tr>
</tbody>
</table>
### Technical data

#### Input data
- **Permissible range (with reference to $U_{N}$)**
  - 0.9 - 1.1
  - 0.8 - 1.2

#### Switching level
- 1 signal ("H") [V DC] ≥ 207
- 0 signal ("L") [V DC] ≤ 92

#### Typ. input current at $U_{N}$
- 2.5 [mA]

#### Typ. switch-on time at $U_{N}$
- 4.4 [ms]

#### Typ. switch-off time at $U_{N}$
- 14 [ms]

#### Transmission frequency $f_{max}$
- 5 [Hz]

- **Input circuit DC**
  - 48 V DC
  - 3 V DC

- **Max. switching voltage**
  - 100 mA

- **Min. switching voltage**
  - 5 [A (t = 1 s)]

- **Output circuit**
  - 3-conductor, ground-referenced

- **Output protection**
  - Protection against polarity reversal, Free running

- **Typ. input current at $U_{N}$**
  - 2.5 [mA]

- **Typ. switch-on time at $U_{N}$**
  - 4.4 [ms]

- **Typ. switch-off time at $U_{N}$**
  - 14 [ms]

- **Transmission frequency $f_{max}$**
  - 5 [Hz]

- **Input circuit AC**
  - 48 V DC
  - 12 V DC

- **Max. inrush current**
  - 5 A

- **Min. switching voltage**
  - 48 V DC

- **Limiting continuous current**
  - 100 mA

- **Max. switching voltage**
  - 100 mA

- **Min. switching voltage**
  - 5 [A (t = 1 s)]

- **Output circuit**
  - 3-conductor, ground-referenced

- **Output protection**
  - Protection against polarity reversal, Surge protection

- **Typ. input current at $U_{N}$**
  - 2.5 [mA]

- **Typ. switch-on time at $U_{N}$**
  - 4.4 [ms]

- **Typ. switch-off time at $U_{N}$**
  - 14 [ms]

- **Transmission frequency $f_{max}$**
  - 5 [Hz]

#### Output data
- **Max. switching voltage**
  - 48 V DC
  - 3 V DC

- **Min. switching voltage**
  - 48 V DC

- **Limiting continuous current**
  - 100 mA

- **Max. switching voltage**
  - 48 V DC

- **Min. switching voltage**
  - 3 V DC

- **Limiting continuous current**
  - 100 mA

- **Max. switching voltage**
  - 48 V DC

- **Min. switching voltage**
  - 3 V DC

#### General data
- **Test voltage input/output**
  - 2.5 kV AC

- **Ambient temperature (operation)**
  - 0°C ... 50°C

- **Standards/regulations**
  - IEC 60664, EN 50178, IEC 62103

- **Pollution degree/surge voltage category**
  - 2 / III

- **Mounting position/mounting**
  - Any / In rows with zero spacing

- **Connection data solid / stranded / AWG**
  - 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12

- **Voltage drop at max. limiting continuous current**
  - ≤ 0.9 V

- **Dimensions**
  - 6.2 mm / 56 mm

#### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEK-17-OV-240DC/48DC/100/ISO 46</td>
<td>2964678</td>
<td>10</td>
</tr>
</tbody>
</table>

#### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMG-GKS 12</td>
<td>2947035</td>
<td>50</td>
</tr>
</tbody>
</table>
Relay modules

Special relays and solid-state relays

Relay modules for high inrush currents

The Phoenix Contact relay modules of the type SO 38 have been designed for switching electrical equipment with high inrush currents.

Areas of application are:
- Inductive loads (motors, power contactors, etc.)
- Inductive/capacitive loads (fluorescent lamps, etc.)
- Ohmic loads (glow lamps, heaters).

The module is based on a relay with a special arc-resistant tungsten lead contact. This takes over the high inrush and interrupting current capacitively. The inductive main contact made of AgCdO takes over the continuous current up to 10 A reliably.

With the EMG 17-REL...2E/SO38 model, this switching capacity is reached using a power relay with a set of silver tin oxide (AgSnO) contacts.

The module is available in two versions:
- Modular EMG rail-mountable housing with a design width of 17.5 mm
- Convenient ST-REL plug-in housing from the Phoenix ST series for mounting on the URELG or UDK-RELG basic terminal blocks.

Further features are:
- Snap-on mounting on the common EN rails
- Easy maintenance
- Clear labeling of the terminal blocks using Phoenix Contact marking material.

### Technical data

<table>
<thead>
<tr>
<th>Input data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to ( U_n ))</td>
</tr>
<tr>
<td>Typ. input current at ( U_n ) [mA]</td>
</tr>
<tr>
<td>Response/release time at ( U_n ) [ms]</td>
</tr>
<tr>
<td>Input protection:</td>
</tr>
<tr>
<td>Output data</td>
</tr>
<tr>
<td>Contact type</td>
</tr>
<tr>
<td>Contact material</td>
</tr>
<tr>
<td>Max. switching voltage</td>
</tr>
<tr>
<td>Limiting continuous current</td>
</tr>
<tr>
<td>Max. inrush current</td>
</tr>
<tr>
<td>Max. interrupting rating, ohmic load</td>
</tr>
<tr>
<td>24 V DC</td>
</tr>
<tr>
<td>48 V DC</td>
</tr>
<tr>
<td>60 V DC</td>
</tr>
<tr>
<td>110 V DC</td>
</tr>
<tr>
<td>220 V DC</td>
</tr>
<tr>
<td>250 V AC</td>
</tr>
<tr>
<td>General data</td>
</tr>
<tr>
<td>Test voltage (winding / contact)</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
</tr>
<tr>
<td>Mechanical service life</td>
</tr>
<tr>
<td>Standards/regulations</td>
</tr>
<tr>
<td>Mounting position/mounting</td>
</tr>
<tr>
<td>Connection data solid / stranded / AWG</td>
</tr>
<tr>
<td>Dimensions</td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay module with power contact relay + wolfram lead contact</td>
<td>ST-REL3-KG 24/ 1/SO38</td>
<td>2829564</td>
<td>10</td>
</tr>
<tr>
<td>Relay module with power contact relay, with two inputs for manual, automatic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic terminal block, complete with end cover</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment marker</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

Type of housing:
- Polycarbonate fiber reinforced PC-F, color: green or black.

Marking systems and mounting material

See Catalog 5

---

Relay modules

Special relays and solid-state relays

Relay modules for high inrush currents

The Phoenix Contact relay modules of the type SO 38 have been designed for switching electrical equipment with high inrush currents.

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Further features are:
- Snap-on mounting on the common EN rails
- Easy maintenance
- Clear labeling of the terminal blocks using Phoenix Contact marking material.
For additional information, visit www.phoenixcontact.net/products

### Technical data

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.85 - 1.1</td>
<td>0.9 - 1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 / 15</td>
<td>9 / 10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Technical data**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic: Yellow LED, Manual: Red LED, freewheeling diode, Protection against polarity reversal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Technical data**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single contact, 1 N/O contact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AgSnO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>250 V AC/DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120 A (20 ms)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>240 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500 VA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Technical data

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AgCdO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>250 V AC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 A (20 ms)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500 VA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Technical data

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20°C ... 50°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approx. 10^7 cycles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IEC 60664, EN 50178, IEC 62103</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.2 - 4 mm² / 0.2 - 2.5 mm² / 17.5 mm / 24 - 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.5 mm / 75 mm / 62.5 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMG 17-REL/KSR-G 24/SO38 BK</td>
<td>2949994</td>
<td>10</td>
</tr>
<tr>
<td>EMG-GKS 12</td>
<td>2947035</td>
<td>50</td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMG 17-REL/KSR-G 24/2E/SO38</td>
<td>2941646</td>
<td>10</td>
</tr>
<tr>
<td>EMG-GKS 12</td>
<td>2947035</td>
<td>50</td>
</tr>
</tbody>
</table>

**Accessories**

**Accessories**

**Relay modules**

Special relays and solid-state relays

Medium to large loads

1 N/O contact (1)

For additional information, visit www.phoenixcontact.net/products

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
Relay modules
Special relays and solid-state relays

ST-OV 3 plug-in solid-state power relays

The plug-in version of the module provides all the advantages of the ST series, such as:
- Switching of up to 400 V AC/3 A
- Control of 230 V motors in straightforward reversing mode (e.g., synchronous motor in single-phase operation, see illustration)
- Plug-in

<table>
<thead>
<tr>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input data</strong></td>
</tr>
<tr>
<td>Switching level with reference to U_n</td>
</tr>
<tr>
<td>Typ. input current</td>
</tr>
<tr>
<td>Transmission frequency</td>
</tr>
<tr>
<td>Input protection:</td>
</tr>
<tr>
<td><strong>Output data</strong></td>
</tr>
<tr>
<td>Operating voltage</td>
</tr>
<tr>
<td>Operating voltage range</td>
</tr>
<tr>
<td>Periodic peak reverse voltage</td>
</tr>
<tr>
<td>Limiting continuous current</td>
</tr>
<tr>
<td>Min. load current</td>
</tr>
<tr>
<td>Surge current</td>
</tr>
<tr>
<td>Residual voltage drop at &quot;H&quot;</td>
</tr>
<tr>
<td>Leakage current in off state</td>
</tr>
<tr>
<td>Output protection</td>
</tr>
<tr>
<td><strong>General data</strong></td>
</tr>
<tr>
<td>Test voltage input/output</td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
</tr>
<tr>
<td>Standards/regulations</td>
</tr>
<tr>
<td>Pollution degree/surge voltage category</td>
</tr>
<tr>
<td>Mounting position/mounting</td>
</tr>
<tr>
<td>Dimensions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ordering data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Input voltage</td>
</tr>
<tr>
<td>Solid-state power relays</td>
</tr>
<tr>
<td><strong>Basic terminal block</strong>, complete with end cover</td>
</tr>
</tbody>
</table>

![Derating curve for ST-OV 3-24DC/400AC/3](image)

Notes:
- Type of insulating housing: polyamide PA non-reinforced, color: bottom part gray, hood green.
- Ground (minus) potential from the input and output of the optocoupler should not be connected.
- AC loads must be protected with a varistor or an RC element.
ST-OV 4-24DC/24DC/...-PRO power protection circuit solid-state relay with signal logic

The ST-OV 4-...PRO provides protection and monitoring functions that are otherwise only known from thermomagnetic protection elements.

The PROtect modules have the following features:
- Fast disconnection with short-circuits and simultaneous current limitation
- Time-dependent overload shutdown for reliable protection against continuous overloads
- Brief inrush peaks are ignored
- After an overload or short-circuit has been triggered, a defined reset of the control voltage must be carried out
- Reliable recognition and indication of a line break on the load side
- Feedback in the event of an error

### Technical data

<table>
<thead>
<tr>
<th>Description</th>
<th>Output current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power circuit breaker solid-state relay, with signal logic</td>
<td>1 A</td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST-OV4- 24DC/ 24DC/1-PRO</td>
<td>2905572</td>
<td>10</td>
</tr>
<tr>
<td>ST-OV4- 24DC/ 24DC/4-PRO</td>
<td>2905585</td>
<td>10</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UDK-RELG 4</td>
<td>2777056</td>
<td>10</td>
</tr>
</tbody>
</table>

Notes:
Type of housing: Polymide PA non-reinforced, color: bottom part gray, hood green
Marking systems and mounting material
See Catalog 5
For load current diagram, see page 347
Derating curve, time/current characteristic curves, and state diagram, see page 347

Special relays and solid-state relays

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For additional information, visit www.phoenixcontact.net/products

PHOENIX CONTACT

409

Courtesy of Steven Engineering, Inc. - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com
DEK-OE 100 kHz input solid-state relay

A solid-state relay for the reliable detection of short pulses
- Limit frequency of up to 100 kHz
- Push-pull stage on output side
- Includes signal inputs on PLC counter boards
- Features a capacitor on the input side for interference suppression

Input data

<table>
<thead>
<tr>
<th></th>
<th>①</th>
<th>②</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permissible range (with reference to (U_{\text{in}}))</td>
<td>0.8 - 1.2</td>
<td>0.8 - 1.2</td>
</tr>
<tr>
<td>Switching level with reference to (U_{\text{in}})</td>
<td>1 signal (&quot;H&quot;) (\geq 0.8), 0 signal (&quot;L&quot;) (\leq 0.4)</td>
<td></td>
</tr>
<tr>
<td>Typ. input current at (U_{\text{in}}) [mA]</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Typ. switch-on time at (U_{\text{in}}) [(\mu\text{s})]</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Typ. switch-off time at (U_{\text{in}}) [(\mu\text{s})]</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Transmission frequency (f_{\text{lim}}) [kHz]</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Output data

- Operating voltage range 4 V DC ... 30 V DC
- Limiting continuous current 50 mA
- Quiescent current 4.3 mA
- Residual voltage drop at "H" \(\leq 0.5\) V DC
- Output circuit 3-conductor, ground-referenced
- Output protection Surge protection

General data

- Test voltage input/output 2.5 kV AC
- Ambient temperature (operation) \(-20^\circ\text{C} ... 60^\circ\text{C}\)
- Standards/regulations IEC 60664, EN 50178, IEC 62103
- Pollution degree/surge voltage category 2 / II
- Connection data solid / stranded / AWG 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
- Dimensions W / H / D 6.2 mm / 80 mm / 56 mm

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Input voltage (U_{\text{in}})</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid-state input relays</td>
<td>5 V DC</td>
<td>DEK-OE-5DC/24DC/100KHZ*1</td>
<td>2994270</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>24 V DC</td>
<td>DEK-OE-24DC/24DC/100KHZ*1</td>
<td>2994283</td>
<td>10</td>
</tr>
</tbody>
</table>

Notes:
- Type of housing: Polyamide PA non-reinforced, color: green.
- Marking systems and mounting material See Catalog 5
- 1) EMC: Class A product, see page 571

Technical data

- Yellow LED, Protection against polarity reversal, Surge protection

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEK-OE-5DC/24DC/100KHZ*1</td>
<td>2994270</td>
<td>10</td>
</tr>
<tr>
<td>DEK-OE-24DC/24DC/100KHZ*1</td>
<td>2994283</td>
<td>10</td>
</tr>
</tbody>
</table>
Relay modules
Special relays and solid-state relays

with DC voltage output push-pull
Transmission frequency 100 kHz

Technical data

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current</th>
<th>Leakage Current</th>
<th>DC Voltage Output</th>
<th>Transmission Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 V DC</td>
<td>50 mA</td>
<td>≤ 0.3 mA</td>
<td>≤ 0.8 mm² / 24 - 12</td>
<td>100 kHz</td>
</tr>
<tr>
<td>18 V DC</td>
<td>15 mA</td>
<td>≤ 0.4 mA</td>
<td>≤ 0.6 mm² / 24 - 12</td>
<td></td>
</tr>
</tbody>
</table>

Output Circuit
3-conductor, ground referenced
Surge Protection
2.5 kV AC
-20°C ... 60°C
IEC 60664, EN 50178, IEC 62103
2 / II
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
6.2 mm / 80 mm / 56 mm

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEK-OE- 5DC/ SDC/100KHZ-G1</td>
<td>2964542</td>
<td>10</td>
</tr>
<tr>
<td>DEK-OE- 24DC/ SDC/100KHZ-G1</td>
<td>2964364</td>
<td>10</td>
</tr>
</tbody>
</table>

For additional information, visit www.phoenixcontact.net/products
Electronic sensor terminal block for NAMUR proximity sensors

The EIK 1-SVN 24-P electronic sensor terminal block from Phoenix Contact converts the changeable resistance of a NAMUR sensor unit into a digital signal that can be read by all PLCs.

- Monitoring of initiator side for short circuits or strand breaks
- Suitable resistance circuit to enable monitoring of mechanical switches (see application 2)
- LED error display
- Status display (high signal) via green LED
- 24 V/50 mA digital output
- Bridging and marking with standard terminal accessories.

Notes:

Type of housing:
Polyamide PA non-reinforced, color: green.

Marking systems and mounting material
See Catalog 5

1) EMC: Class A product, see page 571

Technical data

Supply
Input supply nominal voltage $U_{\text{vin}}$

Ripple
Current consumption $I_{\text{Imax}}$
Input circuit
Control circuit
Non-load voltage
Switching points in accordance with EN 60947-5-6:

Switching hysteresis
Internal resistance
Output protection

Signal output
Max. output current $I_{\text{Omax}}$
Residual voltage $U_R$ with $I_{\text{Omax}}$
Output voltage $U_O$

Output protection

General data
Environmental temperature (operation)
Transmission frequency (INPUT/OUTPUT)
Input pulse length
Input pause length
Standards/regulations
Pollution degree / Surge voltage category
Screw connection solid / stranded / AWG
Dimensions

Application 1

NAMUR initiator

Application 2

UKK 5-2R/NAMUR

Description
Switching amplifier electronic terminal block, for inductive proximity initiators as per NAMUR, with light indicators for sensor signal and faults

Terminal block, with three through contacts, for mounting on NS 35

Double-level terminal block, with pre-assembled resistors

Insertion bridge

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIK1-SVN-24P*</td>
<td>2940799</td>
<td>10</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal block, with pre-assembled resistors</td>
<td>DIKD 1,5</td>
<td>2715979</td>
<td>50</td>
</tr>
<tr>
<td>Insertion bridge</td>
<td>UKK 5-2R/NAMUR</td>
<td>2941662</td>
<td>50</td>
</tr>
</tbody>
</table>

* For inductive proximity sensors according to NAMUR
DEK-TR/INV inverter module

The Phoenix Contact DEK-TR/INV inverter module inverts the signals of ground switching NPN transistor outputs into positive switching PNP outputs, and vice versa (see application example).

### Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>20 V DC ... 30 V DC (U_{in})</td>
</tr>
<tr>
<td>Continuous current</td>
<td>200 mA</td>
</tr>
<tr>
<td>Residual voltage drop</td>
<td>&lt; 1 V</td>
</tr>
<tr>
<td>Leakage current</td>
<td>&lt; 1 mA</td>
</tr>
<tr>
<td>Max. transmission frequency</td>
<td>15 kHz</td>
</tr>
<tr>
<td>NPN input/PNP output</td>
<td></td>
</tr>
<tr>
<td>Switch-on threshold</td>
<td>&lt; 5 V (at U_{in} = 24 V; &lt; (U_{in} - 19 V))</td>
</tr>
<tr>
<td>Switch-off threshold</td>
<td>&gt; 15 V (at U_{in} = 24 V; &gt; (U_{in} - 9 V))</td>
</tr>
<tr>
<td>Min. limit values</td>
<td>-2 V</td>
</tr>
<tr>
<td>Max. limit values</td>
<td>26 V (at U_{in} = 24 V; U_{in} + 2 V)</td>
</tr>
<tr>
<td>Control circuit</td>
<td></td>
</tr>
<tr>
<td>Switch-on threshold</td>
<td>&gt; 19 V</td>
</tr>
<tr>
<td>Switch-off threshold</td>
<td>&lt; 9 V</td>
</tr>
<tr>
<td>Min. limit values</td>
<td>-2 V</td>
</tr>
<tr>
<td>Max. limit values</td>
<td>26 V (at U_{in} = 24 V; U_{in} + 2 V)</td>
</tr>
<tr>
<td>General data</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature (operation)</td>
<td>-20°C ... 50°C</td>
</tr>
<tr>
<td>Standards/regulations</td>
<td>IEC 60664</td>
</tr>
<tr>
<td>Pollution degree / Surge voltage category</td>
<td>2 / II</td>
</tr>
<tr>
<td>Screw connection solid / stranded / AWG</td>
<td>0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12</td>
</tr>
<tr>
<td>Dimensions</td>
<td>W / H / D</td>
</tr>
</tbody>
</table>

### Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverter module</td>
<td>DEK-TR/INV</td>
<td>2964319</td>
<td>10</td>
</tr>
</tbody>
</table>

**Notes:**

Type of housing: Polyamide PA non-reinforced, color: green.

Marking systems and mounting material

See Catalog 5

### Connection examples:

**NPN output**

```
24V  
<table>
<thead>
<tr>
<th>C</th>
<th>NPN</th>
<th>DEK-TR/INV</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>PNP</td>
<td></td>
</tr>
</tbody>
</table>
```

**PNP output**

```
24V  
<table>
<thead>
<tr>
<th>E</th>
<th>NPN</th>
<th>DEK-TR/INV</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>PNP</td>
<td></td>
</tr>
</tbody>
</table>
```
Hybrid relay modules

With its integrated transistor level, the hybrid relay module is able to amplify weak input signals. This serves as the basis for reliable relay operation.

The advantages:
- Low control current (terminal B), type-dependent as of 0.5 mA
- Type-dependent positive or negative control current
- Integrated input and interference suppression circuit
- Safe isolation according to DIN EN 50178 between coil and contact

Technical data

<table>
<thead>
<tr>
<th>Input data</th>
<th>①</th>
<th>②</th>
<th>③</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay supply voltage $U_{N}$ ±10% [V DC]</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Min. control voltage [V DC]</td>
<td>2.7</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Max. control voltage [V DC]</td>
<td>5.25</td>
<td>13.2</td>
<td>35</td>
</tr>
<tr>
<td>Min. control current [mA]</td>
<td>2.6</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Max. control current [mA]</td>
<td>7.7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Typ. input current at $U_{N}$ [mA]</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Response/release time at $U_{N}$ [ms]</td>
<td>9 / 10</td>
<td>9 / 10</td>
<td>9 / 10</td>
</tr>
</tbody>
</table>

Input protection:
- Yellow LED, Protection against polarity reversal, freewheeling diode
- Safe isolation according to DIN EN 50178 between coil and contact

Output data

| Contact type | Single contact, 1-PDT |
| Contact material | AgNi |
| Max. switching voltage 250 V AC/DC | 5 A |
| Limiting continuous current | 8 A |
| Max. interrupting rating, ohmic load | 24 V DC 120 W |
| 48 V DC 60 W | |
| 60 V DC 50 W | |
| 110 V DC 50 W | |
| 220 V DC 80 W | |
| 250 V AC 1250 VA | |

General data

| Test voltage (winding / contact) | 4 kV AC (50 Hz, 1 min.) |
| Ambient temperature (operation) | -20°C ... 50°C |
| Mechanical service life | Approx. 5 x 10^7 cycles |
| Standards/regulations | IEC 60664, EN 50178, IEC 62103 |
| Pollution degree/surge voltage category | 2 / III |
| Connection data solid / stranded / AWG | 0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12 |
| Dimensions W / H / D | 22.5 mm / 75 mm / 62.5 mm |

Ordering data

<table>
<thead>
<tr>
<th>Description</th>
<th>Nominal control voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay module with miniature power contact relay with integrated NPN transistor control, for low control currents</td>
<td>① 5 V DC</td>
</tr>
<tr>
<td>② 12 V DC</td>
<td></td>
</tr>
<tr>
<td>③ 24 V DC</td>
<td></td>
</tr>
<tr>
<td>Relay module with miniature power contact relay with integrated PNP transistor control, for low control currents</td>
<td>① 5 V DC</td>
</tr>
<tr>
<td>② 12 V DC</td>
<td></td>
</tr>
<tr>
<td>③ 24 V DC</td>
<td></td>
</tr>
</tbody>
</table>

Ordering No.: 2949787 (10) 2952363 (10) 2952350 (10)

Accessories

| Equipment marker | EMG-GKS 12 | 2947035 (50) |
Technical data

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>-2.4</td>
<td>-6.9</td>
<td>-17.5</td>
</tr>
<tr>
<td>-5.25</td>
<td>-13.2</td>
<td>-38.5</td>
</tr>
<tr>
<td>1.2</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>1.7</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>9 / 10</td>
<td>9 / 10</td>
<td>9 / 10</td>
</tr>
</tbody>
</table>

Yellow LED, Protection against polarity reversal, freewheeling diode

Single contact, 1-PDT
AgNi
250 V AC/DC
5 A
8 A
120 W
60 W
50 W
50 W
80 W
1250 VA

4 kV AC (50 Hz, 1 min.)
-20°C ... 50°C
Approx. 5 x 10⁷ cycles
IEC 60664, EN 50178, IEC 62103
2 / III
0.2 - 4 mm² / 0.2 - 2.5 mm² / 24 - 12
22.5 mm / 75 mm / 62.5 mm

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
<th>Pcs. / Pkt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMG 22-REL/KSR-G 24/TRP 5¹</td>
<td>2949790</td>
<td>10</td>
</tr>
<tr>
<td>EMG 22-REL/KSR-G 24/TRP12¹</td>
<td>2952156</td>
<td>10</td>
</tr>
<tr>
<td>EMG 22-REL/KSR-G 24/TRP25¹</td>
<td>2952169</td>
<td>10</td>
</tr>
</tbody>
</table>

Accessories

| EMG-GKS 12 | 2947035 | 50 |