Power Relays
Operating instruction

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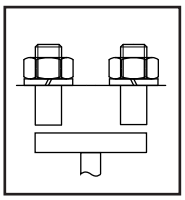
Foreword
The technical notes are used to explain and define the terms and parameters used in the data sheets.

General

Monostable relay: An electrical relay that changes its switching position due to excitation (activation of the coil) and returns to its original switching position after excitation has been deactivated.

Bistable relay: An electrical relay that changes its switching position after a suitable current pulse and remains in its respective switching position by locking; an additional suitable current pulse is necessary to change the switching position. A continual current feed of the relay coil is therefore not necessary.

Bridge contact: Contact with two contact points arranged in series. This contact arrangement is favourable for switching off DC loads as the contact distances double. Most of our relays are fitted with bridge contacts.



Load types:

Ohmic load: Refer to the specifications in the data sheet

Inductive load: High interrupting voltage peaks dependent on the respective inductance. A significantly reduced total service life can be assumed when operating with an inductive load.

Lamp load: Switch-on current > > Nominal current. A significantly reduced total service life can be assumed when operating under a lamp load.

Load voltages: We recommend using erase magnets for load voltages >40 Volt. However, note that the permitted nominal current in the tripping torque is reduced for an increasing load voltage.

Protective circuit: The user is recommended to activate this for inductive loads to eliminate faults (RC element, varistor, free-wheeling diode, etc). When doing so, it must be observed that the shutoff time of the relay can be negatively influenced. Generally the disturbing effect is thereby significantly reduced and the service life of the contact improved.

Requirements for components: The EMC Directive primarily concerns serviceable products with an independent function such as electric motors, power supply units, time relays or temperature controllers. Components that are installed in these types of devices such as switching relays can have different functions in different devices. Switching relays are components without an independent function that are not subject to the EMC Directive.

Responsibility of the user
The specifications described in the catalogue are based on basic tests during product development and empirical values. These can not be applied to all applications.
It is the responsibility of the user to determine whether our products are suitable for the respective application and in case of doubt can only be verified by suitable practical tests.

Terms in the technical data

Ambient temperature: The relay can be operated within this temperature range.

Measures against excess temperatures on the devices: The most frequent cause of excess temperature at connections is an insufficient tightening torque of the connection fittings. The torques specified by the manufacturer should be observed here. If heat is generated, first check whether the connections are sufficiently tightened and whether the cable shoe used is in a faultless condition.
In connection with checking the connections, a check must be made to determined whether the connection cross-sections have been sufficiently dimensioned for the effective value of the current flowing and the type of layout of the cable and line according to the standard. The use of conductors with a cross-section smaller than the one specified by the standard or the manufacturer can lead to significant temperature and functional faults. Adequate air exchange must be ensured.
cable routing: At the use of connection rails, rigid cables or cable routing, make sure that no tractive forces and lateral forces are generated in the connection area.

Protective class: Protective class is understood as the degree a unit is encapsulated as a protection against its environment.

Vibration resistance: The max. acceleration in g (9.81 m/s2) for the frequency range of 50...2000 Hz, for example, in all axes without the closer opening for more than 10 µs in an excited state and the opener in an unexcited state. The vibration resistance of a relay in the excited state is generally higher than in the unexcited state.

Shock resistance: The max. acceleration in g (9.81 m/s2) for the half period of a sine wave (11 ms) in all axes without the contacts opening for > 10 µs.

Switch-on time: Relationship of the excitation time to the total periodic time (cycle time) over a specified time interval. The switch-on time may be specified as a percentage (e.g. 100 %).

Overload: Specifies the current and the time in which the relay can be operated outside of the nominal values. The values refer to the closed contact ad not to the circuits under load. Frequent operation outside of the nominal values reduces the overall service life.

Nominal load service life: Number of switching cycles under the nominal load until failure at room temperature.

Mechanical service life: Number of switching cycles until failure for an unloaded contact circuit. Although this test is undertaken without a contact load, it gives an indication of the electrical service life for very small contact loads.

Attraction time including bounce time: The period between the application of the input nominal voltage until opening or closing for a relay in the normal position (while considering the bounce).

Bounce time: The duration when closing an electric circuit by a closer or opener before the first closure until final closure. The bounce when opening an electric circuit of the switching relay is negligible for normal applications.

Release time: The period between shutting off the input nominal voltage until opening or closing a relay for a rely in the working position. Note: The release time increases for a protective circuit for the coil particularly with a free-wheeling diode.
In addition, it must be ensured that the release voltage of the relay is not exceeded as a result of cable capacitance for long lines or increased residual currents for semiconductor switches. The relay can no longer return to the neutral position if the release voltage is exceeded. A modified line layout may be a remedy here.

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