

New line of solid state relays offered by Relpol S.A.

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Relpol S.A., the Polish manufacturer of electromagnetic relays widened their offer by their own new family of solid state relays of RSR series.

Relpol has offered a wide range of solid state relays for a few years, and the offer has been successively extended by new types and versions. The current offer of Relpol has been supplemented with a new brand line of solid state relays of RSR20, RSR30, RSR40, RSR50 and RSR 60 types. The first three types are to be mounted on printed circuit boards (PCB) whereas RSR50 and RSR60 types are industrial ones which require a radiator in order to achieve full rated power.

Solid-state relays are nowadays widely applied in office and telecommunication equipment and automation systems in temperature regulation equipment. Owing to their wide range of possibilities and compatibility with TTL and CMOS technologies, provide for the use of the SSR's in industrial applications with PLC's.

Introduction

The solid state relays are an equivalent of the traditional electromagnetic relays. The task of SSR's is to control the current load with the use of a semi-conductor power element (e.g. thyristor, triac). The galvanic separation in these relays is implemented with the use of an optic coupling (e.g. optotriac or transoptor) which separates electrically the input circuit of the relay from the working power circuit. Solid state relays offer much more possibilities than the traditional electromagnetic relays as for the type of load control. SSR's provide much higher switchin frequency, possibility to choose the moment of the load switching, and they switch the load off at zero current. Solid state relays are a perfect interface between a low-voltage control circuit and high-voltage part of electrical circuits. The relays provide for switching electric power flow from the source to the receiver as a function of a pulse control signal.

RSR Characteristics

The RSR series of solid state relays is addressed to the wide group of users and manufacturers. The rapid development of electronics, telecommunication and industrial automation makes numerous manufacturers miniaturize their devices. The market competition allows customers to expect better and better reliability and quality of the devices.

RSR20 is a one-pole solid state relay to be mounted in plug-in sockets or on PCB's. It is designed for switching alternating current loads at 240VAC and direct current loads at 60VDC where small loads of up to 3A must be quickly switched. RSR20 (Fig. 1) has an LED indicator to signal the moment of the relay switching. Compatibility with TTL and CMOS technologies, control voltage input from 4 to 32VDC, and low consumption of input power provide for direct control of the relay with a PLC output.



Figs. 1. RSR20 type solid state relay

Depending on the version, they switch at zero voltage (Z – zero cross) or at any time (R – random). The high admissible rated value of the current surge allows the relay to be applied in lighting and drive systems.

Another solid state relay is **RSR30 type relay**.

This is a narrow-profile, one-pole solid state relay to be mounted in plug-in sockets or on PCB's. It is designed for switching 240VAC, 24VDC and 48VDC loads where small loads of up to 2A must be quickly switched.

RSR30 (Fig. 2.) is compatible with TTL and CMOS technologies. It has a wide range of control voltage from 3 to 60VDC. The relay has the function of random switching time (R).



Fig. 2. RSR30 solid state relay – narrow profile

The high admissible rated value of the current surge of up to 80A for alternating current loads provides for the relay's applications in household equipment, office equipment and lighting systems. Together with the narrow-profile sockets of PI6W line, also offered by Relpol, the relay is widely used in automation control systems as a separating relay between PLC and operating devices.

The last solid state relay for PCB mounting is the **miniature, one-pole relay of RSR40 type** (Fig. 3). It is designed for switching alternating current loads of up to 240VAC and direct current loads of 24VDC where small loads of up to 1A must be quickly switched. Like the previously presented relays, RSR40 is compatible with TTL and CMOS technologies, it has a control voltage input from 3 to 32VDC, low resistance and low consumption of input power.



Fig. 3. RSR40-mini solid state relay

Various versions offer zero voltage switching (Z) or random time switching (R). The relays are of **small dimensions (5x20x17 mm)**, and mass of approximately 3g. The relay is used in lighting systems, temperature control in industrial automation control, and in production machinery.

Another group of solid state relays are RSR50 and RSR60 relays in industrial housing with screw terminals.

The RSR50 solid state relay is a one-pole relay in industrial housing, to be mounted on a radiator. It is designed for switching alternating current loads of 240VAC or 440VAC where high loads from 10A to 40A of AC1 category must be switched. RSR50 is compatible with TTL and CMOS technologies, it has control voltage input of 4-32VDC or 50-280VAC and low consumption of input power. Various versions offer zero voltage switching (Z) or random time switching (R). The high admissible value of current surge provides for applications in the systems of lighting, control, temperature control, industrial automation control, production machinery and office equipment. The relay has operation indicator (LED) and integral output suppressing filter.



Fig. 4. RSR50 solid state relay

RSR60 is a power, three-pole solid state relay in industrial housing, designed for operation in three-phase network, and to be mounted on a radiator. It switches alternating current loads from 48V to 440VAC where high loads from 10A to 40A of AC1 category must be switched. RSR60 (Fig.5.) is compatible with TTL and CMOS technologies, it has a voltage control input 4-32V DC and low consumption of input power. The RSR60 relay has an output suppressing filter and low-noise system. It switches at zero voltage (Z). The high admissible value of current surge provides for applications in the systems of lighting, control, temperature control, industrial automation control, production machinery and office equipment. The relay has operation indicator (LED) and integral output suppressing filter.



Fig. 5. RSR60 solid state relay

To sum up, it should be mentioned that the most important feature to distinguish the solid state relays from the traditional solutions is the absence of movable parts, which translates into high durability. Thus, an SSR appropriately selected for a given application may have the life of even one milliard operations. Furthermore, there are no bouncing, contact vibrations while switching, and no risk of contact welding at high overload as the circuit is connected otherwise. The high reliability is also due to the fact that switching with the use of a semi-conductor tool eliminates sparking and electric arc. Solid state relays are also resistant to impact and vibrations. The relays have small dimensions and they switch at high speed. All this provides for applications of the solid state relays where the classic electromagnetic relays cannot be used (analog signal multipliers, telecommunications). The absence of contacts also radically limits the level of electromagnetic disturbance generation and even the switching noise. Solid state relays also offer a significantly higher power reinforcement. They require low control power so that in typical applications they may be controlled directly with the outputs of electronic systems, sensors, regulators, industrial controllers and other automation components. Moreover, the control power hardly depends on the maximum switched power to be switched by the relay.

The advantage of the zero switching of the relays from the extensive offer of Relpol S.A. is minimizing of current pulses generated while the relays switch filament lamps or capacitive loads. The zero current switching significantly reduces the generation of overvoltage at inductive loads even when a significant current-voltage phase shift occurs in the circuit. Moreover, the zero switching of capacitive loads is very beneficial and it does not generate disturbances resulting from slow current value increment in the circuit. The solid state relays, and especially their so-called industrial versions, are equipped with various protective devices and LED indicators. These are circuits which prevent the system from short-circuit, overcurrent, too high switched voltage or overvoltage (RC two-terminal networks, varistors) and status indicators (e.g. LED).

Any technical information is available at the website of Relpol S.A.: www.relpol.com.pl