Monitoring, Controlling and Switching with SIRIUS Relays

One range for every application
The full-range SIRIUS relay portfolio

Every engineer knows that he must be completely up to date when it comes to controls, load feeders and drives. However, with coupling, control and monitoring relays, the search among the various suppliers becomes time-consuming. This is now a thing of the past because we have combined all these products in a single range: SIRIUS®. This makes it easy for you to select the optimum product and guarantees a top price-performance ratio.

SIRIUS relays – one range for every application

Our range of SIRIUS relays comprises everything required for motor feeder applications. With maximum ease and comfort. From a single source. Whether compact timing or reliable monitoring relays, particularly narrow coupling relays, plug-in relays, low-noise power relays or signal converter our relay range is the most complete and comprehensive portfolio on the market. We offer relays for each and every application. Moreover, all SIRIUS relays offer outstanding ease of operation. Take a closer look at our portfolio and convince yourself. You will be surprised.

The highlights at a glance

• Broad applicability comprehensive portfolio
• User-friendly easy operation
• Multi-functional flexibly applicable relays
• Practice-oriented graded for customized performance
• Open communication with the control thanks to IO-Link interface
• Excellent cost/performance ratio

Use of SIRIUS relays
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SIRIUS Monitoring Relays for IO-Link

**Reliable monitoring and protection**

SIRIUS relays from Siemens offer maximum machine and system protection and now also communicate with the control level thanks to IO-Link. The new SIRIUS relays for IO-Link monitor line quality, current values, voltages, speeds and temperatures with the known reliability while supporting an even broader application area.

**SIRIUS speaks IO-Link**

With the SIRIUS monitoring relays for IO-Link, you opt for maximum flexibility: In addition to the unchanged autonomous monitoring function, measured values and data can be directly transferred to the control via IO-Link. Also parameterization can either be realized locally or via IO-Link. The SIRIUS relays for IO-Link are thus fully integrated in Totally Integrated Automation, our open system architecture for integrated automation. Moreover, you will benefit from considerably eased device replacement – thanks to data comparison and automatic re-parameterization via parameter servers.

**Your advantages**

- Precise monitoring of electrical, mechanical and temperature values
- Reliable protection of motors and system components
- Realization of simple autonomous temperature control tasks (2-point, 3-point control)
- Connection to the control level via IO-Link
- Central fault diagnostics and localization
- Eased commissioning and maintenance
- Efficient energy management with SIRIUS 3UG48: Support of the data formats defined in the PROFIsenergy profile

**SIRIUS monitoring relays for IO-Link:**

- **SIRIUS 3RR24:** 3-phase current monitoring directly integrated in the load feeder
- **SIRIUS 3UG48:** Monitoring of electrical and mechanical parameters: Voltage, current, power factor and speed
- **SIRIUS 3RS14 / 15:** Monitoring of temperatures

**Unique consistency: IO-Link integrated in Totally Integrated Automation**

- IO-Link engineering SIMATIC S7-PCT
- Visualisation: SIMATIC HMI WinCC
- PROFINET/PROFIBUS

**Diagram:**

- Control cabinet installation
- Field devices
- Actuators
- ET 200S with IO-Link Master
- S7-300/400 control
- SIMATIC ET 200eco PN with IO-Link Master
- K20 IO-Link module
- Further field devices
- IO-Link sensors
- Standard sensors
3RP20/25 and 7PV15 Timing Relays
for DIN rail mounting

Electronic timing relays are used for all time-delayed switching processes in control, starting, protection and regulation circuits. Thanks to their elaborate operating concept and space-saving, compact design, the 3RP20/25 timing relays are ideal timing devices for manufacturers of industrial control cabinets, power distribution boards and controls. With their narrow design, the 7PV15 timing relays are particularly suitable for applications in heaters, fans, air-conditioning systems and compressors.

Application

ON-delay
- Interference pulse suppression (gating of interference pulses)
- Successive motor starting to prevent mains overloads

OFF-delay
- Generation of overtravel functions after disconnection of the control voltage (e.g. fan run-on)
- Successively delayed disconnection of motors, fans, etc., for targeted system shutdown

Wye/star)-delta
- Motor start-up with reduced starting current in wye (star) circuit
- Switchover to delta operation for full motor power after adjustable time
- Short switchover break to prevent interphase short circuit with delayed contactor switching

Multifunction
- Maximum flexibility: one device with wide-range supply for all time functions

Watchdog function
- Monitoring of cyclic events

Your advantages

- The right construction type for any application
- Compact range for all applications thanks to multifunctional devices and wide voltage range
- Short cycle times and bounce-free and wear-free switching thanks to timing relays with semiconductor output
- Significant logistical advantages thanks to versions with wide voltage and wide time setting ranges
- DIN rail mounting and disassembly without tools
- Cadmium-free relay contacts
- Recyclable, halogen-free enclosure

3RP20/25 timing relays
- Documentation of the set function on the multifunctional timing relay via label sets (3RP20) or adhesive film (3RP25)
- Sealable cover for safeguarding of set parameters

7PV15 timing relays
- Minimum variance: One design both for power distribution boards and control cabinets
- Compliance with EMC requirements for residential areas
- Switchover break with wye/star)-delta adjustable from 50 ms to 1 sec, for optimum adjustability to the application
Applications of the 3RP20/25 and 7PV15 ranges

**3RP20 – the timing relay in contactor design:**
Recommended for small distance between DIN rails and/or low installation depths, e.g. in control boxes.

**3RP25 – the premium range for all applications in industrial-standard width 22.5 mm and space-saving 17.5 mm:** for variable use thanks to versions with 1 or 2 relays, screw and spring-type terminals, hard gold-plated contacts, positively driven operation, etc.

**7PV15 – the version for standard applications:**
Narrow and cost-favorable, both for control cabinets and power distribution boards.
3RA2811/12/16, 3RA2831/32 Function Modules for mounting on 3RT2 contactors

The function modules facilitate the mounting of starters and contactor assemblies for direct-on-line and wye(star)-delta starting. They comprise all important control functions required for the respective feeder – e.g. timing and electric interlocking function. The function modules, which act as timing relays, can be rapidly and easily mounted on SIRIUS contactors – without laborious wiring. They support contactor switching both with ON- and OFF-delay.

Application
ON-delay
• Time-delayed starting of multiple drives for example reduces the summation starting current and thus prevents the occurrence of line voltage dips or cable overloads (cascade circuit)

OFF-delay
• Time-controlled disconnection of a drive’s control signal after a start pulse, e.g. with gate control, follow-up ventilation

Function modules for wye(star)-delta start
• Switchover during drive starting, e.g. switchover of large fans from wye (star) to delta as current-limiting measure
• Fixed switchover break of 50 ms for short-circuit protection
• Universal use thanks to wide voltage and large setting range of the wye (star) start time

Your advantages
• Reduction of control circuit wiring
• Prevention of wiring faults
• 24 – 240 V AC/DC wide voltage range for control supply voltage and contactor coil control
• Reduced testing costs
• Realization of control-independent timing functions
• Space savings in the control cabinet (compared to a separate timing relay)
• No additional protective circuit required (integrated varistor)
• Automatic preference circuit with wye(star)-delta function modules for further reduction of current peaks
• Assembly of wye(star)-delta starters, including timing function and electric interlocking, without additional wiring
• Approvals in accordance with IEC, CCC, UL and CSA standards
3RA2813/14/15 Time-Delayed Auxiliary Switches
for mounting on 3RT2 contactors

The electronically delayed auxiliary switches for mounting onto contactors are dimensioned for contactor coil voltages from 24 to 240 V AC/DC (wide voltage). Auxiliary switches for control and status signals are employed especially for the switching of very small signals for electronic applications. They are used for example for pump or fan run-on similar to OFF-delay timing relays or the delayed switch-on of a gate drive. Both the electrical and mechanical connection are realized by simply snapping the device on and locking it. A varistor is integrated in the time-delayed auxiliary switch for the attenuation of switching overvoltages in the contactor coil.

Application

ON-delay
• For example for the delayed readiness signaling of a drive after start-up with centrifugal mass

OFF-delay
• Generation of run-on functions for fans or pumps after disconnection of the control voltage

Your advantages

• Flexible use for all contactor control supply voltages in the 24 – 240 V AC/DC range
• Selectable outputs 1 NO + 1 NC or 1 CO
• All modules with 24 – 240 V AC/DC wide voltage in the auxiliary circuit
• Integrated electric interlocking and factory-integrated varistor (protective circuit) – easy configuration
• Plug-on function modules for connection without tools
• High setting accuracy thanks to selectable time ranges
• Reduced variance – only 1 module for sizes S00 and S0
• Add-on modules for reduced wiring and space savings

SIRIUS 3RA2811/12/16, 3RA2831/32 and 3RA2813/14/15

• As distinct from other timing relays, 3RA2811/12/16 and 3RA2831/32 function modules do not have relay outputs. They are timing relays that are directly mounted onto 3RT2 contactors. Rather than the contactors themselves, it is the function modules that are controlled, with the modules switching the contactors below them via direct contact to the contactor coil.

• With 3RA2813/14/15 time-delayed auxiliary switches, the 3RT2 contactor is controlled which then switches on or off instantaneously. The auxiliary switch mounted on the contactor responds to this via voltage tap on the contactor coil and switches the relay outputs with a time delay.
3UG451/461/463 and 3UG481/483 Monitoring Relays
for line and voltage monitoring

The 3UG4 monitoring relays provide a maximum degree of protection for machines and systems. They facilitate the early detection of line and voltage faults, allowing for their rectification before any consequential damage can occur.

Application
Typical applications can be derived from the table on page 11.

Your advantages

- Thanks to the wide voltage range, the monitoring relays can be used on any power systems around the world – from 160 V to 600 V AC – without separate auxiliary voltage
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Narrow width for all versions
- Permanent display of ACTUAL value and type of line fault with digital versions
- Automatic correction of rotation direction by differentiating between line faults and incorrect phase sequence

Configuration of 3-phase line monitoring

Scan the QR code and watch a video!
<table>
<thead>
<tr>
<th>Measured variable</th>
<th>Possible system fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase sequence</td>
<td>• Direction of rotation of the drive</td>
</tr>
<tr>
<td>Phase failure</td>
<td>• Fuse tripping</td>
</tr>
<tr>
<td></td>
<td>• Control supply voltage failure</td>
</tr>
<tr>
<td></td>
<td>• Single-phase operation of a motor with corresponding overheating</td>
</tr>
<tr>
<td>Phase asymmetry</td>
<td>• Motor overheating due to asymmetric voltages or phase failure</td>
</tr>
<tr>
<td></td>
<td>• Detection of asymmetrically loaded supply systems</td>
</tr>
<tr>
<td></td>
<td>• Phase failure detection despite regenerative feedback</td>
</tr>
<tr>
<td>Undervoltage</td>
<td>• Increased motor current with respective overheating</td>
</tr>
<tr>
<td></td>
<td>• Unintended device reset</td>
</tr>
<tr>
<td></td>
<td>• Mains failure, particularly with battery supply</td>
</tr>
<tr>
<td></td>
<td>• Threshold value switch for analog signals from 0 to 10 V</td>
</tr>
<tr>
<td>Overvoltage</td>
<td>• System protection against destruction caused by supply overvoltages</td>
</tr>
<tr>
<td></td>
<td>• System switch-on upon reaching a certain voltage</td>
</tr>
<tr>
<td></td>
<td>• Threshold value switch for analog signals 0 to 10 V</td>
</tr>
</tbody>
</table>
3RR21/22 and 3RR24 Monitoring Relays
for direct mounting on contactors for multi-phase current monitoring

The 3RR2 monitoring relays are used not only for monitoring motors or other loads, but additionally also facilitate optimum current monitoring of the entire system or driven process. This for example allows for the early detection and signaling of load shedding or motor overloads. The 3RR2 monitoring relay for current monitoring is directly integrated in the load feeder. It is simply plugged onto the contactor.

Application
- Monitoring for current overshoot and undershoot
- Monitoring of open circuit
- Monitoring of no-load operation and load shedding, e.g., in the event of a torn V-belt or no-load operation of a pump
- Monitoring of overload, e.g., caused by excessive loading of conveyor belts or cranes
- Monitoring of the functionality of electric loads such as heaters
- Monitoring of wrong phase sequences on mobile equipment such as compressors or cranes
- Monitoring of high-impedance faults to ground, e.g., due to damaged insulation or moisture

Your advantages
- Direct mounting on 3RT2 contactors, i.e., no additional wiring overhead in the main circuit
- Optimally matched to the technical characteristics of 3RT2 contactors, no separate current transformers required
- 2- or 3-phase current monitoring, apparent or active current monitoring
- Display of ACTUAL values and status messages
- Easy determination of threshold values by means of direct reference to actually measured values under setpoint load
- Only one device is required for motor monitoring along the entire torque curve
- Monitoring for cable break, phase failure/sequence, fault current, motor blocking

Scan the QR code and watch a video!
3UG4621/4622/4641 and 3UG4822/4841 Monitoring Relays

for single-phase current, power factor and active current monitoring

The 3UG4 relays for current, active power and active current monitoring are ideally suited for monitoring the load of motors and the functionality of electronic loads. These devices detect signs of wear and faults early on, thereby for example facilitating the timely implementation of maintenance measures to prevent system failures.

Application

Current monitoring
• Overload monitoring
• Underload monitoring close to the rated torque
• Monitoring of the functionality of electric loads
• Wire breakage monitoring
• Energy management (phase current monitoring)
• Threshold value switch for analog signals from 4 to 20 mA

Power factor and active current monitoring
• No-load monitoring
• Underload monitoring in the lower power range
• Overload monitoring
• Easy power factor monitoring in networks for the control of compensation systems
• Energy management
• Cable breakage between control cabinet and motor

Your advantages
• Reduced stock-keeping thanks to wide-voltage versions
• Variably adjustable to overshoot, undershoot or window monitoring
• Freely parameterizable delay times and RESET response
• Permanent display of ACTUAL value and type of fault
• Setting of monitoring limits on the basis of real measured values
• Real rms value measurement

Current monitoring
• Only two versions from 2 mA to 10 A
• Applicable for frequencies with 40–500 Hz AC and DC

Power factor and active current monitoring
• Global use thanks to wide voltage from 90 to 690 V AC
• Monitoring of smaller single-phase motors with a no-load current below 0.5 A
• One device for motor monitoring, from no-load to overload
• Voltage-independent monitoring of the motor load

Rule of thumb: The power factor changes significantly below the rated load; the current increases disproportionally above the rated load.

The active current I_{\text{res}} indicates a linear correlation between the motor load and the measured value over the entire measuring range.
3UG4625 and 3UG4825 Monitoring Relays

for residual current monitoring

Residual-current monitoring relays are used for monitoring residual currents that can result in insulation problems in plants due to humidity or severe contamination. By using the 3UG4625 or 3UG4825 residual-current monitoring relay in combination with a 3UL23 summation current transformer, such hazards can be eliminated. Thanks to adjustable limit or warning threshold values, the relay issues a warning before the limit value is reached and switches off reliably when the limit value is exceeded after a certain delay time.

The 3UG4825 monitoring relays have an IO-Link interface for digital transfer of measured values to the control.

Application

Monitoring of systems prone to residual currents, e.g. caused by:

- Dust deposits or humidity
- Porous cables and lines
- Capacitive residual currents

Your advantages

- Can be used worldwide thanks to a wide voltage range from 24 to 240 V AC/DC
- Measuring range from 30 mA to 40 A
- Variably adjustable threshold values for warning and disconnection
- Freely parameterizable delay times and RESET response and connectable fault memory
- Permanent display of the actual value and fault diagnostics via display
- High level of flexibility and space saving through installation of the transformer outside the control cabinet
- All diagnostics data are now available in the control
3UG458 Monitoring Relays
for insulation monitoring

Insulation monitoring relays are used for monitoring the insulation resistance between ungrounded single- or three-phase current supplies and a protective conductor. Ungrounded, i.e. isolated networks (IT networks) are always used where high demands are placed on the reliability of the power supply, e.g. emergency lighting systems. After an initial insulation fault it is possible to continue working in safety (single-fault safety). The fault must still be rectified as quickly as possible before a second insulation fault occurs (e.g. according to DIN VDE 0100-410). For this purpose insulation monitoring relays are used which constantly measure the resistance to ground of the phase conductor and the neutral conductor, reporting a fault immediately if insulation resistance falls below the set value.

Application

Amongst others, IT networks are employed in the following applications:

- Emergency power supply systems
- Emergency lighting systems
- Industrial production plants with high availability requirements (chemical industry, automotive industry, printing industry)
- Marine and railway applications
- Mobile current generators (airplanes)
- Renewable energies, e.g. wind energy and photovoltaic plants
- Mining

Your advantages

- Devices for AC and DC systems
- All devices with wide supply voltage range
- Direct connection to networks with line voltages up to 690 V AC and 1000 V DC via voltage reducer module
- With AC networks: Frequency range 15 ... 400 Hz
- Monitoring for line breakage
- Monitoring for faulty settings
- Application safety thanks to integrated system start after start-up
- Reset and test option (via button on the front or control contact)
- Rapid response times thanks to new predictive measuring principle
3UG4501 Monitoring Relays
for level monitoring

3UG4 monitoring relays also detect non-electrical variables. Our 3UG4501 level monitoring relays thus ensure reliable 1- and 2-point controls and alarms in case of overflow or dry running – according to a simple principle: almost all liquids are conductive. This is utilized for monitoring levels. If the probes are immersed in the liquid, current flows – if the probes fall dry, no current flows.

Application
• 1- and 2-point level control
• Overflow protection
• Dry running protection
• Leakage monitoring

Your advantages
• Can be used worldwide thanks to wide voltage range from 24 to 240 V AC/DC
• Individually trimmable 2- and 3-pole wire electrodes for easy mounting from the top/bottom
• Bow electrodes for lateral installation for higher filling levels and minimum space requirements
• Flexibly adjustable to various conductive liquids through analog setting of the sensitivity from 2 to 200 kΩ
• Compensation of wave movements thanks to tripping delay times from 0.1 to 10 seconds
• Selectable feed or discharge function

1- and 2-point level monitoring, overflow protection

<table>
<thead>
<tr>
<th>Product kΩ</th>
<th>Product kΩ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buttermilk 1 Natural water 5</td>
<td></td>
</tr>
<tr>
<td>Fruit juice 1 Wastewater 5</td>
<td></td>
</tr>
<tr>
<td>Vegetable juice 1 Starch solution 5</td>
<td></td>
</tr>
<tr>
<td>Milk 1 Oil 10</td>
<td></td>
</tr>
<tr>
<td>Soup 2.2 Condensed water 18</td>
<td></td>
</tr>
<tr>
<td>Beer 2.2 Soap foam 18</td>
<td></td>
</tr>
<tr>
<td>Coffee 2.2 Jams 45</td>
<td></td>
</tr>
<tr>
<td>Ink 2.2 Jellies 45</td>
<td></td>
</tr>
<tr>
<td>Saltwater 2.2 Sugar solution 90</td>
<td></td>
</tr>
<tr>
<td>Wine 2.2 Whisky 220</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distilled water 450</td>
</tr>
</tbody>
</table>

This method is applicable with very many liquids and substances. Prerequisite: Specific resistance < 200 kΩ

Scan the QR code and watch a video!
3UG4651 and 3UG4851 Monitoring Relays
for speed monitoring

The 3UG4651 and 3UG4851 speed monitoring relays monitor the setpoint speed of motors, shafts or driven wheels for overshoot or undershoot. Implementing a period measurement, they monitor the pulses delivered per rotation from the sensors. In addition, the relays are suitable for all functions requiring the monitoring of a continuous pulse signal, e.g. belt operation and scan time monitoring or bypass control. The 3UG4851 monitoring relays have an IO-Link interface for digital transfer of measured values to the control.

Application
- Slip/breakage of a belt drive
- Load shedding
- Standstill monitoring (no operator protection)
- Transport item monitoring for completeness

Your benefits
- Can be used worldwide thanks to wide voltage range from 24 to 240 V AC
- Variably adjustable to overshoot, undershoot or window monitoring
- Freely parameterizable delay times and RESET response
- Permanent display of ACTUAL values or type of fault
- Use of up to 10 sensors per rotation with extremely slowly rotating motors
- Connection option for 2- or 3-conductor sensors and sensors with mechanical switching or electronic output
- Integrated auxiliary voltage for sensor

Speed monitoring example with 3UG4651

Without enable input

With enable input

Scan the QR code and watch a video!
3RN1 Thermistor Motor Protection

for protection against overheating

Thermistor motor protection relays provide decisive benefits in cases in which current-dependent protection using either a circuit breaker or an overload relay is not the perfect solution: In specific cases, often as a result of external effects, overheating can occur without being detected by the thermal image in the circuit breaker or overload relay. Examples for this include heavy-duty starting (e.g. centrifuges), operation with frequency converters or frequent switching, braking operations or when cooling is restricted, e.g. due to accumulated dirt.

Application

• Protection of motors against overheating, particularly with heavy-duty starting, braking operation, frequent switching or insufficient cooling
• "Warning and disconnection" function based on two sensor circuits with different response temperatures for responding prior to disconnection (additional cooling, load reduction, etc.)
• Multiple motor protection with only one device, e.g. with conveyor lines comprising multiple motors which are to be disconnected jointly

Characteristics for type A thermistor sensor

![Characteristics graph]

Your advantages

• Direct measuring of the motor winding temperature
• Only one device for all motor power ratings
• Device/terminal labeling according to DIN EN 50005 for "normal" switching relays and for overload protection systems
• Relays with hard gold-plated contacts for application under difficult conditions
• Indication of wire breakage and short circuit in the sensor circuit via LED
• Version with safe isolation up to 300 V in accordance with DIN/VDE 0106 as well as version with bistable relays for special cases
• ATEX approval for gases and dust
3RS10/3RS11 Temperature Monitoring Relays

analog-adjustable

The 3RS10 / 3RS11 temperature monitoring relays are specialized in the measuring of temperatures in solid, liquid and gaseous media. The temperature is detected via sensors inside the medium, then evaluated by the device and monitored for overshoot or undershoot of the limit temperatures. Depending on the parameterization, the output relay switches on or off upon reaching the threshold values.

Application

• Motor and system protection
• Control cabinet temperature monitoring
• Frost monitoring
• Temperature limits for process parameters, e.g. in the packing industry or galvanizing systems
• System and machine control, e.g. heating, air-conditioning and ventilation systems, solar collectors, heat pumps or hot water supply systems
• Bearing and gear oil monitoring
• Coolant monitoring

Your advantages

• All devices with galvanic isolation, exception: 24 V AC/DC
• Easy operation via rotary potentiometer
• Selectable hysteresis
• Selectable operating principle for devices with two threshold values
3RS10/11/20/21 and 3RS14/15 Temperature Monitoring Relays
digital-adjustable

Suitable for temperature measuring in solid, liquid and gaseous media, these relays monitor temperatures for overshoot and undershoot or within a specific operating range (window function). The devices also present a good alternative to temperature controllers in the low-end range.

**Your advantages**
- Easy operation without complicated menu guidance
- 3-digit LED display for indication of the temperature
- Connection option for resistance sensors in 2- or 3-conductor technology
- Galvanic isolation with wide voltage supply versions
- Versions in °C and °F available (switch from °C to °F with IO-Link possible)

**Application**
- System and environmental protection
- Temperature limits for process parameters, e.g. in the packing industry or galvanizing systems
- Temperature monitoring for heat generation plants
- Monitoring of exhaust gas temperatures
- System and machine control, e.g. heating, air-conditioning and ventilation systems, solar collectors, heat pumps or hot water supply systems
- Motor, bearing and gear oil temperature monitoring
- Coolant monitoring

**Characteristics of most important resistance temperature sensors**

**Characteristics for thermocouples**

Scan the QR code and watch a video!
3RQ3 Coupling Relays

in 6.2 mm slimline, compact design with relay output

3RQ3 coupling relays have been innovated and are now available in a high-quality enclosure design with a uniform look across the range. With a width of just 6.2 mm and a low mounting depth and height, they are ideal for optimizing the use of space in control cabinets with narrow tier spacing or in flat switchboxes. All versions are available with either screw terminals or spring-type terminals with push-in technology. The wire inlet and front clamping option additionally serves to reduce wiring times.

Application

• Electrical isolation
• Voltage conversion, e.g. from 24 V DC to 230 V AC
• Signal amplification
• General relay controls
• Overvoltage and EMC protection of controls

Your advantages with 3RQ3

<table>
<thead>
<tr>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Option of either screw terminals or spring-type terminals with push-in technology – ensures rapid and reliable wiring</td>
</tr>
<tr>
<td>• Cable inlet and terminals accessible from the front – accelerates the wiring process and avoids errors</td>
</tr>
<tr>
<td>• Width of 6.2 mm across the entire range – reducing space requirements in the control cabinet</td>
</tr>
<tr>
<td>• Lower device variance – reduced inventory costs</td>
</tr>
<tr>
<td>• Green LED – displays functional state of the relay coupler</td>
</tr>
<tr>
<td>• Uniform accessories for all devices – Universal bridging option with connecting combs for all terminals – Galvanic isolation plate for isolating different voltages for neighboring units – &quot;Clip-on&quot; labels that can be individually printed</td>
</tr>
<tr>
<td>• Optional connecting comb for rapidly bridging equal potentials without the need for wiring</td>
</tr>
</tbody>
</table>

With permanently soldered relays

• Increased contact reliability

With plug-in relays

• Quicker replacement of worn relays with existing wiring
• Shorter installation times thanks to certified complete units
• Device versions optionally with hard gold-plated contacts
• Single relays available as components

Coupling relays as input or output coupler

<table>
<thead>
<tr>
<th>I/O devices</th>
<th>Electronic control</th>
<th>Actuators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pushbuttons, position switches</td>
<td>Input coupling links</td>
<td>Input 24 V DC</td>
</tr>
<tr>
<td>110 V AC 230 V AC</td>
<td>Output coupling links</td>
<td>Output 24 V DC</td>
</tr>
<tr>
<td>24 V DC</td>
<td>110 V AC 230 V AC</td>
<td>Motor contactors</td>
</tr>
</tbody>
</table>
3RQ3 Coupling Relays

in 6.2 mm slimline, compact design with semiconductor output

The latest coupling relays are available either with conventional relays or as a semiconductor version. Semiconductor coupling relays offer some significant advantages over electromechanical units – electronic components are extremely reliable and have a very long service life (see below). This means that the input coupler is the better option overall in terms of both technology and price. When considering output couplers, the question of whether to use a relay or semiconductor should be answered by taking into account the requirements concerning switching capacity and the number of operating cycles.

If a relay has to be replaced just once during the entire service life of a machine, then a semiconductor coupler will already have paid for itself. All versions are available with either screw-type terminals or spring-type terminals with push-in technology.

Application

• Electrical isolation, voltage conversion
• Switching of DC loads
• Switching of capacitive loads
• Overvoltage and EMC protection of controls

Your advantages – 3RQ3 with semiconductor output

• Extremely long electrical service life/unlimited number of switching cycles
• Extremely high contact reliability
• High DC switching capacity
• Short switching times
• Optional connecting comb for rapidly bridging equal potentials without the need for wiring
• Noise-free switching

Use of semiconductor couplers

Service life comparison

Semiconductor coupling relays or coupling relays with semiconductor outputs have a significantly longer service life than electromechanical relays.
3RS18 Coupling Relays

in industrial enclosure

The 3RS18 coupling relays set the standard: With a wide voltage range extending from 24 V to 240 V AC/DC they are an absolute highlight in the coupling market. We offer you in this range devices in the field-proven 22.5 mm industrial enclosure with one, two or three changeover contacts – with screw-type or spring-type terminals and in combined voltage or wide voltage with hard gold-plated contacts for particularly high contact reliability even with low currents. Thanks to the field-proven industrial enclosure you benefit – as with our timing relays – from a user-friendly connection method with permanent wiring. Two conductors per clamping point can be connected.

Application

- Wherever electronically optimized contacts are required and devices with wide voltage are used
- Predestined for inputs and outputs on PLC thanks to hard gold-plated contacts

Your advantages

- One product for all voltages
- Cost savings thanks to reduced variance
- Particularly high contact reliability even with low currents
LZS Coupling Relays
with plug-in relays

Plug-in relay couplers are available both as complete devices and as individual modules for self-assembly or spare parts requirements. The range is divided into three types: RT, PT and MT.

Application
- As coupling relay for galvanic isolation between field and input and outputs of electronic controls
- Contact multiplication
- Switching of small loads
- As potential transfer switch

Your advantages
- Wiring without tools and vibration-proof connection thanks to innovative push-in spring-type terminals
- Base with logical isolation for easy wiring
- Tested AC-15 and DC-13 switching capacity
- Available coil voltages: 24 V DC, 24 V AC, 115 V AC, 230 V AC
- Hard gold-plated contacts for optimum interaction with electronic controls

Configuration information
The test lever of the PT relay does not feature a latching mechanism. If the test lever is pressed further until a movement of 90° is reached, two small snap-in lugs break off and the test lever can be set to latching. When using plug-in relays with voltages of 60 Hz AC, the lower response value has to be increased by 10%, the power loss decreases slightly.

Types

<table>
<thead>
<tr>
<th>LZS:RT</th>
<th>LZS:PT</th>
<th>LZS:MT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or 2 CO contacts</td>
<td>2, 3 or 4 CO contacts</td>
<td>3 CO contacts</td>
</tr>
<tr>
<td>AC-1: 16/8 A</td>
<td>AC-1: 12/10/6 A</td>
<td>AC-1: 10 A</td>
</tr>
<tr>
<td>Width: 15.5 mm</td>
<td>Width: 28 mm</td>
<td>Width: 38 mm</td>
</tr>
</tbody>
</table>

Wiring bracket for push-in spring-type terminal base and Screw terminal base
Signal converters are mainly used to electrically isolate and convert analog signals. Sensors/actuators and controls generally have different power supply units, and must therefore be electrically isolated from one another. This is either integrated in the control or is implemented using a signal converter. A signal has to be converted into another signal if, for instance, a voltage signal needs to be converted for transmission over a long distance into a current signal, or if the output of a sensor and the input of a control are incompatible with one another. Another application is offered by the implemented frequency outputs, which convert the input signal into a proportional frequency. This means that analog signals can be processed with digital inputs. This is important if the control does not have any provisions for an analog input, or if all of its analog inputs are already assigned, e.g. when devices are retrofitted.

Passive converters
Passive converters do not require a supply voltage as the energy they require is supplied via the analog signal.

3-way separation
In 3-way separation, each circuit is isolated from the other circuits, i.e. the input, output, and supply voltage potentials are not linked, meaning that they cannot affect each other.

Application
- Galvanic isolation of analog signals
- Conversion of analog signals
- Conversion of analog signals into a frequency
- Conversion of non-standardized signals into standardized signals
- Overvoltage and short-circuit protection for analog PLC inputs

Your advantages
- High-quality, modern titanium gray design
- Look is consistent with all other Siemens devices in the control cabinet
- Simplified logistics and inventory management thanks to reduced device variance resulting from exclusive use of 3-way isolation
- Little space required on the mounting rail:
  - Slimline, compact design with width of 6.2 mm and low installation depth/height
  - For flat control boxes and control cabinets with tight tier spacing
3TG10 Power Relays
for high performance with minimum dimensions

The 3TG10 power relays are the ideal solution for all applications requiring small, low-noise relays or contactors at low costs. The power relays are suitable for basic controls and particularly for use in large-scale series devices and controls. They are ideal for applications which require only one auxiliary contact and no overload relay – and place increased requirements upon switching capacity, switching voltage and service life.

Application
• Domestic appliances and installations
• Hoisting systems: Small elevators, elevating platforms
• Building technology, hum-free application in building systems, e.g. in hospitals

Your advantages
• Any mounting position, hum-free
• Safe isolation
• Screw-type or plug-in connection
• Integrated auxiliary switch
• AC-3 power: 4 kW / 400 V
• Operating current I/AC-1: 20 A / 400 V
• Inrush current per phase: 90 A
• Integrated overvoltage damping
• Narrow width of only 36 mm

Configuration information
With a 20 A load on the three main current paths, the following applies with I > 10 A for the fourth current path:
Permissible ambient temperature 40 °C
The information provided in this brochure contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

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