

Monitoring and Control Devices

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Article No.
3RA1943-2C 3RA1943-2B 3RA1953-2B 3RA1953-2N

Or directly on the Internet, e.g.
www.siemens.com/product?3RA1943-2C

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10/30	- LOGO! CMK2000 communication modules	10/128 Speed monitoring
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10/34	Accessories	10/132 General data
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10/36	LOGO!Contact	10/138 Relays, digitally adjustable for 1 sensor
10/37	LOGO! Software	10/140 Relays, digitally adjustable for up to 3 sensors
	Relays <u>Timing relays</u>	10/142 Accessories
10/38	General data	<u>SIRIUS 3RS14, 3RS15 temperature monitoring relays for IO-Link</u>
10/39	SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm NEW	10/143 General data
10/51	SIRIUS 3RP20 timing relays, 45 mm	10/148 Relays, digitally adjustable for 1 sensor
10/57	7PV15 timing relays, 17.5 mm	10/151 Relays, digitally adjustable for up to 3 sensors
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3/106	SIRIUS 3RA28 function modules for mounting onto 3RT2 contactors and 3RH2 contactor relays	10/154 SIRIUS 3RN2 thermistor motor protection NEW
3/102	SIRIUS 3RT19 timing relays for mounting onto 3RT1 contactors	<u>Coupling relays and signal converters/interface converters</u>
	<u>SIRIUS 3RR21, 3RR22 monitoring relays for mounting onto 3RT2 contactors</u>	5/32 Coupling relays
10/62	Current and active current monitoring <u>SIRIUS 3RR24 monitoring relays for mounting onto 3RT2 contactors for IO-Link</u>	3/152 3TG10 power relays/miniature contactors
10/70	Current and active current monitoring <u>SIRIUS 3UG45, 3UG46 monitoring relays for stand-alone installation</u>	10/163 SIRIUS 3RS70 signal converters
10/77	General data	
10/79	Line monitoring	

¹⁾ See Catalog ST 70.

Note:

For the conversion tool, e.g. from 3RP15 to 3RP25, from 3RS17 to 3RS70 or from 3RN1 to 3RN2, see www.siemens.com/sirius/conversion-tool

Monitoring and Control Devices

Introduction

Overview



Type	SIMOCODE pro C	SIMOCODE pro V PROFINET General Performance	SIMOCODE pro S General Performance	SIMOCODE pro V High Performance PROFIBUS/PROFINET Modbus RTU/EtherNet/IP	Page
SIMOCODE pro 3UF7 motor management and control devices					
Basic units	✓	✓	✓	✓	10/16
Current measuring modules	✓	✓	✓	✓	10/17
Current/voltage measuring modules	--	--	--	✓	10/17
Operator panels	✓	✓	✓	✓	10/18
Operator panels with display	--	--	--	✓	10/18
Expansion modules	--	✓	✓	✓	10/19
Fail-safe expansion modules	--	--	--	✓	10/21
Current transformers	✓	✓	✓	✓	10/25
SIMOCODE ES (TIA Portal)	✓	✓	✓	✓	14/12
SIMOCODE pro block library for SIMATIC PCS 7	✓	✓	✓	✓	14/16

✓ Available

-- Not available



Type	Basic units	Expansion modules	Software	Page
LOGO! logic modules				
LOGO! basic modules with display	✓	--	--	10/27
LOGO! basic modules without display	✓	--	--	10/28
LOGO! expansion modules	--	✓	--	10/29
LOGO! CMK2000 communication modules	--	✓	--	10/30
LOGO! CSM unmanaged	--	✓	--	10/31
LOGO! CMR (mobile wireless communication)	--	✓	--	10/32
LOGO!Contact	--	✓	--	10/36
LOGO! Software	--	--	✓	10/37

✓ Corresponds to

-- Does not correspond to



Type	3RP25	3RP20	7PV15
Timing relays			
Enclosures:			
• 17.5 mm industry and household equipment installation	✓	--	✓
• 22.5 mm industry	✓	--	--
• 45 mm industry	--	✓	--
Monofunction	✓	✓	✓
Multifunction	✓	✓	✓
Combination voltage	✓	✓	✓
Wide voltage range	✓	✓	✓
Application:			
• Control systems and mechanical engineering	✓	✓	✓
• Infrastructure	--	--	✓
Page	10/39	10/51	10/57

✓ Corresponds to or available

-- Does not correspond to or not available



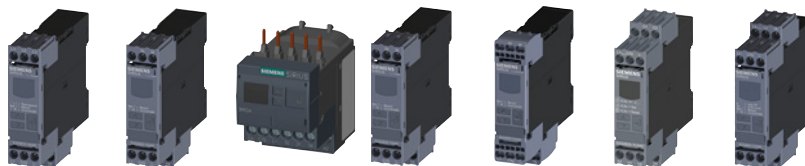
Type	3UG451., 3UG461.	3UG463.	3RR21, 3RR22, 3UG4621, 3UG4622	3UG4641	3UG4625 with 3UL23	3UG458.	3UG4501	3UG4651	Page
Monitoring relays									
Line monitoring	✓	--	--	--	--	--	--	--	10/79
Voltage monitoring	--	✓	--	--	--	--	--	--	10/84
Current monitoring	--	--	✓	--	--	--	--	--	10/62, 10/87
Active current monitoring	--	--	3RR22 ✓	✓	--	--	--	--	10/62, 10/89
Power factor monitoring	--	--	--	✓	--	--	--	--	10/89
Residual-current monitoring	--	--	--	--	✓	--	--	--	10/92
Insulation monitoring	--	--	--	--	--	✓	--	--	10/97, 10/99
Level monitoring	--	--	--	--	--	--	✓	--	10/102
Speed monitoring	--	--	--	--	--	--	--	✓	10/105

✓ Available

-- Not available

Monitoring and Control Devices

Introduction



Type	3UG481.	3UG4832	3RR24	3UG4822	3UG4841	3UG4825 with 3UL23	3UG4851	Page
Monitoring relays for IO-Link								
Line monitoring	✓	--	--	--	--	--	--	10/112
Voltage monitoring	--	✓	--	--	--	--	--	10/115
Current monitoring	--	--	✓	✓	--	--	--	10/70, 10/118
Power factor and active current monitoring	--	--	✓	--	✓	--	--	10/70, 10/121
Residual-current monitoring	--	--	--	--	--	✓	--	10/125
Speed monitoring	--	--	--	--	--	--	✓	10/128
✓ Available -- Not available								



Type	3RS10, 3RS11, 3RS20, 3RS21	3RS14, 3RS15	3RN2	3RS70	Page
Temperature monitoring relays					
Temperature monitoring	✓	--	--	--	10/136, 10/138, 10/140
Temperature monitoring relays for IO-Link					
Temperature monitoring for IO-Link	--	✓	--	--	10/148, 10/151
Thermistor motor protection					
Thermistor motor protection	--	--	✓	--	10/154
Signal converters					
Single-range converters	--	--	--	✓	10/163
Multi-range converters	--	--	--	✓	10/163
Universal converters	--	--	--	✓	10/163
✓ Available -- Not available					

Connection methods

The monitoring and control devices are available with screw or spring-type terminals.

SIRIUS 3RP25 timing relays, SIRIUS 3RN2 thermistor motor protection and SIRIUS 3RS70 signal converters are available with screw terminals or spring-type terminals (push-in).



Screw terminals



Spring-type terminals, spring-type terminals (push-in)

The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

"Increased safety" type of protection EEx e/d according to ATEX directive 2014/34/EU

The communication-capable, modularly designed SIMOCODE pro motor management system (SIRIUS Motor Management and Control Devices) protects motors of types of protection EEx e and EEx d in hazardous areas.

"Increased safety" type of protection EEx e/d according to ATEX directive 2014/34/EU

The SIRIUS 3RN2 thermistor motor protection relay protects motors with types of protection EEx e and EEx d in hazardous areas.

ATEX approval for operation in hazardous areas

The SIRIUS SIMOCODE pro 3UF7 motor management system is certified for the protection of motors in hazardous areas according to

- ATEX Ex I (M2); equipment group I, category M2 (mining)
- ATEX Ex II (2) GD; equipment group II, category 2 in area GD

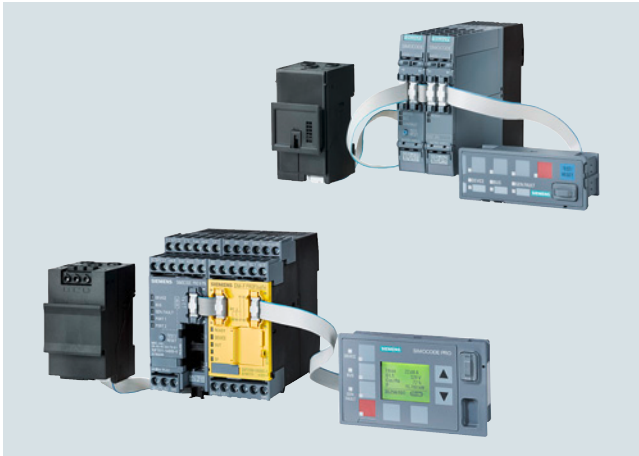
The SIRIUS 3RN2011, 3RN2012-...30, 3RN2013 and 3RN2023 thermistor motor protection relays for PTC sensors are certified according to ATEX Ex II (2) G and D for environments with explosive gas or dust loads.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

Overview



SIMOCODE pro S and SIMOCODE pro V

More information

Homepage, see www.siemens.com/simocodeIndustry Mall, see www.siemens.com/product?3UF7

TIA Selection Tool Cloud (TST Cloud)

- For SIMOCODE pro S, see <https://mall.industry.siemens.com/spice/TSTWeb/?kmat=SimocodeProS>
- For SIMOCODE pro V, see <https://mall.industry.siemens.com/spice/TSTWeb/?kmat=SimocodeProV>

SIMOCODE pro is a flexible, modular motor management system for motors with constant speeds in the low-voltage performance range. It optimizes the connection between I&C and motor feeder, increases plant availability and allows significant savings to be made for installation, commissioning, operation and maintenance of a system.

SIMOCODE pro offers, for example:

- Multifunctional, solid-state full motor protection that is independent of the automation system
- Integrated control functions instead of hardware for the motor control
- Detailed operational, service and diagnostics data
- Open communication via PROFIBUS DP, PROFINET/OPC UA, Modbus RTU or EtherNet/IP
- Safety relay function for the fail-safe disconnection of motors up to SIL 3 (IEC 61508, IEC 62061) or PL e with Category 4 (EN ISO 13849-1)
- SIMOCODE ES (TIA Portal) is the software package for SIMOCODE pro parameterization, start up and diagnostics.

Device series

Basic Performance with SIMOCODE pro C

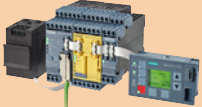
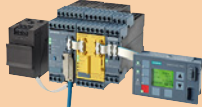




The compact system for direct-on-line starters and reversing starters or for controlling a motor starter protector.

General Performance with SIMOCODE pro S or SIMOCODE pro V PN GP

The smart system for direct-on-line, reversing, and wye-delta starters or for controlling a motor starter protector or soft starter. Its expandability with an expansion module/multifunction module provides comprehensive input/output project data volume, precise ground-fault detection via the 3UL23 residual-current transformers and temperature measurement.

High Performance with SIMOCODE pro V

The variable system with all control functions and with the possibility of expanding the inputs, outputs and functions of the system at will using expansion modules

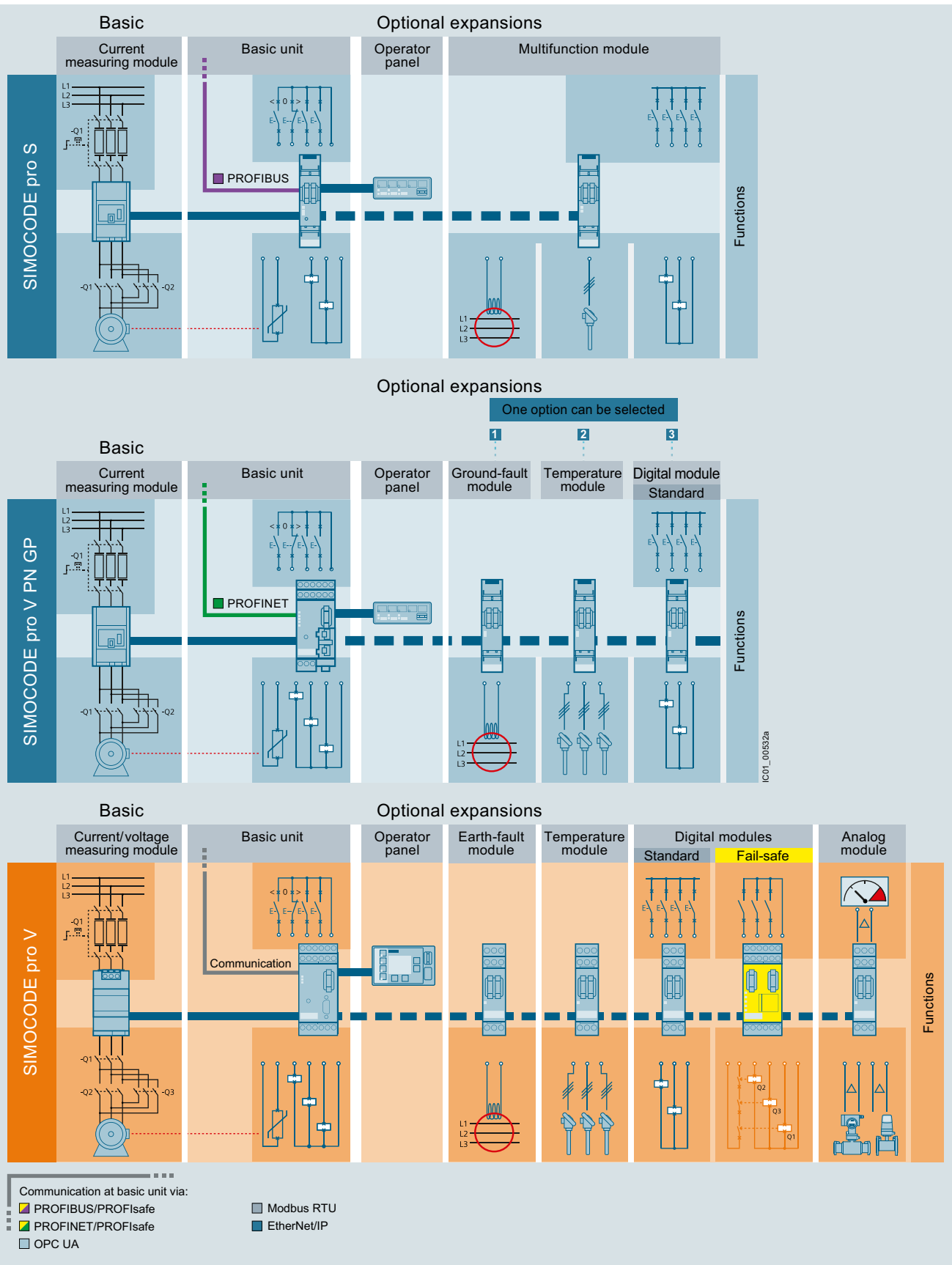
	PROFINET IO / OPC UA	ETHERNET / IP	PROFIBUS	MODBUS RTU	
Current/voltage measuring module					High Performance
Operator panel with display					
Max. 5/7 expansion modules					
Safety					
Extended control functions (e.g. positioner, pole-changing starter)					
Current measuring module					General Performance
Operator panel					
1 expansion module					
Basic control functions (e.g. direct-on-line/reversing start)					
	SIMOCODE pro V PN	SIMOCODE pro V EIP	SIMOCODE pro V PB	SIMOCODE pro V MR	
	SIMOCODE pro V PN GP		SIMOCODE pro S		

Device series

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data



System structure

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

Expansion possibilities	SIMOCODE pro C Basic Performance PROFIBUS	SIMOCODE pro S General Performance PROFIBUS	SIMOCODE pro V General Performance PROFINET GP	SIMOCODE pro V High Performance PROFIBUS/Modbus RTU	PROFINET/ EtherNet/IP
Operator panels	✓	✓	✓	✓	✓
Operator panels with display	--	--	--	✓	✓
Current measuring modules	✓	✓	✓	✓	✓
Current/voltage measuring modules	--	--	--	✓	✓
Expansion modules:					
• Digital modules	--	--	1 ²⁾	2	2
• Fail-safe digital modules ¹⁾	--	--	--	1	1
• Analog modules	--	--	--	1	2
• Ground-fault modules	--	--	1	1	1
• Temperature modules	--	--	1	1	2
• Multifunction modules	--	1	--	--	--

✓ Available

-- Not available

1) The fail-safe digital module can be used instead of one of the two digital modules.

2) Only monostable version can be used.

Per feeder each system always comprises one basic unit and one separate current measuring module. The two modules are connected together electrically through the system interface with a connection cable and can be mounted mechanically connected as a unit (one behind the other) or separately (side by side). The motor current to be monitored is decisive only for the choice of the current measuring module.

An operator panel for mounting in the control cabinet door is optionally connectable through a second system interface on the basic unit. Both the current measuring module and the operator panel are electrically supplied by the basic unit through the connection cable. More inputs, outputs and functions can be

added to the SIMOCODE pro V and SIMOCODE pro S by means of optional expansion modules, thus supplementing the inputs and outputs already existing on the basic unit. With the DM-F Local and DM-F PROFIsafe fail-safe digital modules it is also possible to integrate the fail-safe disconnection of motors in the SIMOCODE pro V motor management system.

All modules are connected by connection cables. The connection cables are available in various lengths. The maximum distance between modules (e.g. between the basic unit and the current measuring module) must not exceed 2.5 m. The total length of all the connection cables per system interface of the basic unit may be up to 3 m.

Article No. scheme

Product versions		Article number	
SIMOCODE pro motor management system		3UF7	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - 1 <input type="checkbox"/> <input type="checkbox"/> 0 <input type="checkbox"/> - 0
Type of unit/module	e.g. 0 = basic unit	<input type="checkbox"/>	
Functional version of the module	e.g. 20 = SIMOCODE pro S	<input type="checkbox"/> <input type="checkbox"/>	
Connection type of the current transformer	e.g. A = through-hole technology	<input type="checkbox"/>	
Voltage version	e.g. B = 24 V DC	<input type="checkbox"/>	
Enclosure color	e.g. 1 = titanium gray	<input type="checkbox"/>	
Example		3UF7	0 2 0 - 1 A B 0 1 - 0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

Benefits

General customer benefits

- Integrating the whole motor feeder into the process control by means of PROFIBUS DP, PROFINET/OPC UA, Modbus RTU or EtherNet/IP significantly reduces the wiring between the motor feeder and the PLC
- Decentralization of the automated processes by means of configurable control and monitoring functions in the feeder saves resources in the automation system and ensures full functionality and protection of the feeder even if the I&C or bus system fails
- The acquisition and monitoring of operating, service and diagnostics data in the feeder and process control system increases plant availability as well as maintenance and service-friendliness
- The high degree of modularity allows users to perfectly implement their plant-specific requirements for each motor feeder
- The SIMOCODE pro system offers functionally graded and space-saving solutions for each customer application
- The replacement of the control circuit hardware with integrated control functions decreases the number of hardware components and wiring required and in this way limits stock keeping costs and potential wiring errors
- The use of electronic full motor protection permits better utilization of the motors and ensures long-term stability of the tripping characteristic and reliable tripping even after years of service
- Thanks to the precision of the current, voltage, power and energy measurements (especially those acquired by the 2nd-generation current/voltage measuring modules), costs can be internally allocated with a high degree of accuracy
- By virtue of its wide frequency range (20 to 400 Hz), SIMOCODE can be used in combination with the 2nd-generation current/voltage measuring modules in a wide range of motor applications.

Multifunctional, electronic full motor protection for rated motor currents up to 820 A

SIMOCODE pro offers comprehensive protection of the motor feeder by means of a combination of different, multi-step and delayable protection and monitoring functions:

- Inverse-time delayed electronic overload protection (CLASS 5E to 40E)
- Thermistor motor protection
- Phase failure/unbalance protection
- Stall protection
- Monitoring of adjustable limit values for the motor current
- Voltage and power monitoring
- Monitoring of the power factor (motor idling/load shedding)
- Ground-fault monitoring
- Temperature monitoring, e.g. via Pt100/Pt1000
- Monitoring of operating hours, downtime and number of starts etc.

Recording of measuring curves

SIMOCODE pro can record measuring curves and therefore is able, for example, to present the progression of motor current during motor start up.

Flexible motor control implemented with integrated control functions (instead of comprehensive hardware interlocks)

Many predefined motor control functions have already been integrated into SIMOCODE pro, including all necessary logic operations and interlocks:

- Overload relays
- Direct-on-line and reversing starters
- Wye/delta starters (also with direction reversal)
- Two speeds, motors with separate windings (pole-changing starter); also with direction reversal
- Two speeds, motors with separate Dahlander windings (also with direction reversal)
- Positioner actuation
- Solenoid valve actuation
- Actuation of a motor starter protector
- Soft starter actuation (also with direction reversal)

These control functions are predefined in SIMOCODE pro and can be freely assigned to the inputs and outputs of the device (including the PROFIBUS/PROFINET process image).

These predefined control functions can also be flexibly adapted to each customized configuration of a motor feeder by means of freely configurable logic modules (truth tables, counters, timers, edge evaluation, etc.) and with the help of standard functions (power failure monitoring, emergency start, external faults, etc.), without additional auxiliary relays being necessary in the control circuit.

SIMOCODE pro makes a lot of additional hardware and wiring in the control circuit unnecessary, which results in a high level of standardization of the motor feeder in terms of its design and circuit diagrams.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

Detailed operational, service and diagnostics data

SIMOCODE pro makes different operational, service and diagnostics data available and helps to detect potential faults in time and to prevent them by means of preventative measures. In the event of a malfunction, a fault can be diagnosed, localized and rectified very quickly – there are no or very short downtimes.

Operating data

- Motor switching state derived from the current flow in the main circuit
- All phase currents
- All phase voltages and phase-to-phase voltages
- Active power, apparent power and power factor
- Phase unbalance and phase sequence
- Ground-fault current
- Frequency
- Time to trip
- Motor temperature
- Remaining cooling time etc.

Service data

- Motor operating hours
- Motor stop times
- Number of motor starts
- Number of overload trips
- Interval for compulsory testing of the enabling circuits
- Energy consumed
- Internal comments stored in the device etc.

Diagnostics data

- Numerous detailed early warning and fault messages
- Internal device fault logging with time stamp
- Time stamping of freely selectable status, alarm or fault messages etc.

Easy operation and diagnostics

Operator panel

The operator panel is used to control the motor feeder and can replace all conventional pushbuttons and indicator lights to save space. It makes SIMOCODE pro or the feeder directly operable in the control cabinet. It features all the status LEDs available on the basic unit and externalizes the system interface for simple parameterization or diagnosis on a PC/PG.

Operator panel with display

As an alternative to the 3UF720 standard operator panel for SIMOCODE pro V, a 3UF721 operator panel with display is also available. This can additionally indicate current measured values, operational and diagnostics data or status information of the motor feeder at the control cabinet. The pushbuttons of the operator panel can be used to control the motor. Furthermore, it is possible to set parameters such as rated motor current, limit values, etc. directly via the operator panel with display (with SIMOCODE pro V PROFIBUS as of E15, SIMOCODE pro V Modbus RTU as of E03 and with all SIMOCODE pro V PROFINET and EtherNet/IP).

Communication

SIMOCODE pro has either an integrated PROFIBUS DP or Modbus RTU interface (SUB-D or terminal connection) or a PROFINET or EtherNet/IP interface (2 x RJ45).

Fail-safe disconnection through PROFIBUS or PROFINET with the PROFIsafe profile is also possible in conjunction with a fail-safe controller (F-CPU) and the DM-F PROFIsafe fail-safe digital module.

SIMOCODE pro PROFIBUS

SIMOCODE pro PROFIBUS supports, for example:

- Cyclic services (DPV0) and acyclic services (DPV1)
- Extensive diagnostics and hardware interrupts
- Time stamp with high timing precision (SIMATIC S7) for SIMOCODE pro V
- DPV1 communication after the Y-Link

SIMOCODE pro PROFINET

SIMOCODE pro PROFINET supports, for example:

- Line and ring bus topology (for 2-port devices with an integrated switch)
- Media redundancy via MRP protocol (for 2-port devices with an integrated switch)
- Operating, service and diagnostics data via standard web browser
- OPC UA server for open communication with visualization and control system
- NTP-synchronized time
- Interval function and measured values for power management via PROFIenergy
- Module exchange without PC/memory module through proximity detection
- Extensive diagnostics and maintenance alarms

System redundancy with SIMOCODE pro PROFINET

All SIMOCODE PROFINET devices support the system redundancy mechanisms of PROFINET IO and therefore can be operated directly on fault-tolerant systems such as SIMATIC S7-400 H. As such, SIMOCODE pro can provide decisive added value also for the field level of plants in which plant availability and control system redundancy are priorities.

SIMOCODE pro Modbus RTU

SIMOCODE pro Modbus RTU supports, for example:

- Communication at 1 200/2 400/4 800/9 600/19 200 or 57 600 baud
- Access to freely parameterizable process image via Modbus RTU
- Access to all operating, service and diagnostics data via Modbus RTU

SIMOCODE pro EtherNet/IP

SIMOCODE pro EtherNet/IP supports, for example:

- Line and ring bus topology thanks to an integrated switch
- Ring structures via Device Level Ring (DLR) protocol
- Operating, service and diagnostics data via standard web browser
- NTP-synchronized time
- Parameter assignment via SIMOCODE ES V14 or higher – via local device interface and Ethernet

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions represent only one component of such a concept.

For more information on Industrial Security, see www.siemens.com/industrialsecurity.

Autonomous operation

An essential feature of SIMOCODE pro is the autonomous execution of all protection and control functions, even when communication to the I&C system is interrupted. This means that even in the event of bus system or automation system failure, full functionality of the feeder is ensured or a specific behavior can be parameterized in case of such a fault, e.g. targeted shutdown of the feeder or execution of particular parameterized control mechanisms (such as reversal of the direction of rotation).

Advantages from integrated energy management

siemens.com/
energysuite

Ready for
SIMATIC
Energy Suite

As an integrated option for the TIA Portal, the SIMATIC Energy Suite couples energy management with automation efficiently, making energy consumption at your production facility transparent.

Thanks to the simplified configuration of energy-measuring components, e.g. SIMOCODE pro V, configuration effort is also clearly reduced.

Thanks to end-to-end connection with higher-level energy management systems or cloud-based services, you can seamlessly expand the recorded energy data to create a cross-site energy management system.

The advantages at a glance:

- Automatic generation of energy management data
- Integration into TIA Portal and into automation
- Simple configuration

For more information, see page 1/3 or www.siemens.com/energysuite.

Application

SIMOCODE pro is often used for automated processes where plant downtimes are very expensive (e.g. chemical, oil/gas, water/wastewater, steel or cement industries) and where it is important to prevent plant downtimes through detailed operational, service and diagnostics data or to localize faults very quickly when they occur.

SIMOCODE pro is modular and space-saving and suited especially for operation in motor control centers (MCCs) in the process industry and for power plant technology.

Applications

- Protection and control of motors in hazardous areas for types of protection EEx e/d according to ATEX directive 2014/34/EU
 - With heavy starting (paper, cement, metal and water industries)
 - In high-availability plants (chemical, oil, raw material processing industries, power plants)
- New: Dry-running protection of centrifugal pumps based on active power monitoring for type of protection Ex b

Use of SIMOCODE pro 3UF7 with IE3/IE4 motors

Note:

When using the SIMOCODE pro 3UF7 in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see [Application Manual](#).

For more information, see page 1/7.

Safety technology for SIMOCODE pro

The safe disconnection of motors in the process industry is becoming increasingly important as the result of new and revised standards and requirements in the safety technology field.

With the DM-F Local and DM-F PROFIsafe fail-safe expansion modules it is easy to integrate functions for fail-safe disconnection in the SIMOCODE pro V motor management system while retaining service-proven concepts. The strict separation of safety functions and operational functions proves particularly advantageous for planning, configuring and construction. Seamless integration in the motor management system leads to greater transparency for diagnostics and during operation of the system.

Suitable components for this purpose are the DM-F Local and DM-F PROFIsafe fail-safe expansion modules, depending on the requirements:

- The DM-F Local fail-safe digital module for when direct assignment between a fail-safe hardware shutdown signal and a motor feeder is required, or
- The DM-F PROFIsafe fail-safe digital module for when a fail-safe controller (F-CPU) creates the signal for disconnection and transmits it in a fail-safe manner through PROFIBUS/PROFIsafe or PROFINET/PROFIsafe to the motor management system

New: Dry-running protection of centrifugal pumps with SIMOCODE pro in hazardous areas

With special versions of the current/voltage measuring modules, SIMOCODE pro enables dry-running protection of centrifugal pumps through active power monitoring and motor switch-off. This applies to centrifugal pumps with progressive flow characteristics, which are also suitable for pumping flammable media and are also installed in hazardous areas. If the active power, and thus the flow rate, falls below a minimum value, the motor – and thus the centrifugal pump – is switched off. When determining the limit values to be monitored, the user is supported by a menu-guided teach-in process in the engineering software.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

Technical specifications

More information

Technical specifications, see
<https://support.industry.siemens.com/cs/ww/en/ps/16337/td>
 Manual Collection "SIMOCODE pro", see
<https://support.industry.siemens.com/cs/ww/en/view/109743951>
 System Manual "SIMOCODE pro Safety Fail-Safe Digital Modules", see
<https://support.industry.siemens.com/cs/ww/en/view/50564852>

Application Manual "SIRIUS Controls with IE3/IE4 motors", see
<https://support.industry.siemens.com/cs/ww/en/view/94770820>
 Configuration Manual "Load Feeders – SIRIUS Modular System", see
<https://support.industry.siemens.com/cs/ww/en/view/39714188>

General data

General data		
Type		3UF7
Permissible ambient temperature		
• During operation	°C	-25 ... +60; 3UF721: 0 ... +60
• During storage and transport	°C	-40 ... +80; 3UF721: -20 ... +70
Degree of protection (acc. to IEC 60529)		
• Measurement modules with busbar connection		IP00
• Operator panel (front) and door adapter (front) with cover		IP54
• Other components		IP20
Shock resistance (sine pulse)	g/ms	15/11
Mounting position		Any
Frequency	Hz	50/60 ± 5%
EMC interference immunity (according to IEC 60947-1)		
• Conducted interference, burst acc. to IEC 61000-4-4	kV	Corresponds to degree of severity 3
	kV	2 (power ports)
	V	1 (signal port)
• Conducted interference, high frequency acc. to IEC 61000-4-6		10
• Conducted interference, surge acc. to IEC 61000-4-5	kV	2 (line to ground); 3UF7320-1AB, 3UF7330-1AB: 1 (line to ground)
	kV	1 (line to line); 3UF7320-1AB, 3UF7330-1AB: 0.5 (line to line)
• Electrostatic discharge, ESD acc. to IEC 61000-4-2	kV	8 (air discharge); 3UF7020: Operator input during operation only on the front
	kV	6 (contact discharge); 3UF721: 4 (contact discharge)
• Field-related interference acc. to IEC 61000-4-3	V/m	10
EMC emitted interference (according to IEC 60947-1)		
• Conducted and radiated interference emission		EN 55011/EN 55022 (CISPR 11/CISPR 22) (corresponds to degree of severity A)
Protective separation (acc. to IEC 60947-1)		All circuits in SIMOCODE pro are safely separated from each other according to IEC 60947-1, i.e. they are designed with doubled creepage paths and clearances. In this context, compliance with the instructions in the test report "Safe Isolation" No. 2668 is required.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

Basic units		
Type	3UF7000-1AU00-0, 3UF7010-1AU00-0, 3UF7011-1AU00-., 3UF7020-1AU01-0, 3UF7012-1AU00-0, 3UF7013-1AU00-0 3UF7000-1AB00-0, 3UF7010-1AB00-0, 3UF7011-1AB00-., 3UF7020-0AB01-0, 3UF7012-1AB00-0, 3UF7013-1AB00-0	
Control circuit		
Rated control supply voltage U_s (acc. to IEC 61131-2)	110 ... 240 V AC/DC; 50/60 Hz	24 V DC
Operating range		
• SIMOCODE pro C (3UF7000) and SIMOCODE pro V PROFIBUS (3UF7010) SIMOCODE pro V Modbus RTU (3UF7012)	0.85 ... 1.1 x U_s	0.80 ... 1.2 x U_s
• SIMOCODE pro V PROFINET (3UF7011), SIMOCODE pro V EtherNet/IP (3UF7013) and SIMOCODE pro S (3UF7020)		
- Operation	0.85 ... 1.1 x U_s	0.80 ... 1.2 x U_s
- Start up	0.85 ... 1.1 x U_s	0.85 ... 1.2 x U_s
Power consumption ¹⁾		
• SIMOCODE pro C (3UF7000) and SIMOCODE pro S (3UF7020)	7 VA/5 W	5 W
• SIMOCODE pro V PROFIBUS (3UF7010) and SIMOCODE pro V Modbus RTU (3UF7012)	10 VA/7 W	7 W
• SIMOCODE pro V PROFIBUS E15/V4.0 (3UF7010-1A.00-0-Z B01) and SIMOCODE pro V Modbus RTU E03/V2.0 (3UF7012-1A.00-0-Z B01)	7 VA/5 W	4 W
• SIMOCODE pro V PROFINET (3UF7011) and SIMOCODE pro V EtherNet/IP (3UF7013)	11 VA/8 W	8 W
Rated insulation voltage U_i	V	300 (for pollution degree 3)
Rated impulse withstand voltage U_{imp}	kV	4
Relay outputs		
• Number	3 monostable relay outputs	
- SIMOCODE pro C, SIMOCODE pro V (incl. SIMOCODE pro V PN GP)	2 monostable relay outputs	
- SIMOCODE pro S		
• Specified short-circuit protection for auxiliary contacts (relay outputs)	6 A operational class gG; 10 A quick-response (IEC 60947-5-1)	
- Fuse links	1.6 A, C characteristic (IEC 60947-5-1); 6 A, C characteristic ($I_k < 500$ A)	
- Miniature circuit breaker	6	
• Rated uninterrupted current	A	
• Rated switching capacity	6 A/24 V AC; 6 A/120 V AC; 3 A/230 V AC	
- AC-15	2 A/24 V DC; 0.55 A/60 V DC; 0.25 A/125 V DC	
- DC-13		
Inputs (binary)	4 inputs supplied internally by the device electronics (with 24 V DC) and connected to a common potential	
Thermistor motor protection (binary PTC)		
• Summation cold resistance	kΩ	≤ 1.5
• Response value	kΩ	3.4 ... 3.8
• Return value	kΩ	1.5 ... 1.65

2nd-generation current/voltage measuring modules						
Type		3UF7..0-1AA01-0	3UF7..1-1AA01-0	3UF7..2-1AA01-0	3UF7..3-1.A01-0	3UF7..4-1BA01-0
Main circuit						
Current setting I_e	A	0.3 ... 4	3 ... 40	10 ... 115	20 ... 200	63 ... 630
Rated insulation voltage U_i	V	690				
Rated operational voltage U_e	V	690				
Rated impulse withstand voltage U_{imp}	kV	6				
Rated frequency	Hz	50/60				
Type of current		Three-phase current				
Short circuit		Additional short-circuit protection is required in the main circuit				
Typical voltage measuring range						
• Phase-to-phase voltage/line-to-line voltage (e.g. $U_{L1 L2}$)	V	110 ... 690				
• Phase voltage (e.g. $U_{L1 N}$)	V	65 ... 400				
Accuracy at 25 °C, 50/60 Hz						
Valid for voltage range		• Phase-to-phase voltage U_L in the range 0.85 x 110 V ... 1.1 x 690 V				
Valid for current range		• Phase voltage U_L in the range 0.85 x 65 V ... 1.1 x 400 V				
	A	0.25 ... 8/ 8 ... 32	2.25 ... 80/ 80 ... 320	7.5 ... 230/ 230 ... 920	15 ... 400/ 400 ... 1 600	47 ... 1 260/ 1 260 ... 5 040
• Voltage measurement	%	± 1.5				
• Current measurement	%	± 1.5/3 (typical)				
• Temperature drift of current measurement						
- 3UF7110-1AA01-0	%	± 0.02 K				
- 3UF7111-1AA01-0, 3UF7112-1AA01-0, 3UF7113-1AA01-0, 3UF7113-1BA01-0, 3UF7114-1BA01-0	%	± 0.01 K				
• Power factor measurement (p.f. ≥ 0.5)	%	± 1.5/5 (typical)				
• Apparent power measurement (p.f. ≥ 0.5)	%	± 3/5 (typical)				
• Active power measurement (p.f. ≥ 0.5)	%	± 5/10				
• Energy measurement (p.f. ≥ 0.5)	%	± 5/10				
• Frequency measurement (p.f. ≥ 0.5)	%	± 1.5				
Notes on voltage measurement		In the supply lines from the main circuit for voltage measurement of SIMOCODE pro it may be necessary to provide additional line protection!				
• Supply lines for voltage measurement						

¹⁾ All values are based on a combination consisting of basic unit, current measuring module and operator panel.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

Current measuring modules						
Type		3UF7100-1AA00-0	3UF7101-1AA00-0	3UF7102-1AA00-0	3UF7103-1.A00-0	3UF7104-1BA00-0
Main circuit						
Current setting I_e	A	0.3 ... 3	2.4 ... 25	10 ... 100	20 ... 200	63 ... 630
Rated insulation voltage U_i	V	690; 3UF7103 and 3UF7104: 1 000 (at pollution degree 3)				
Rated operational voltage U_e	V	690				
Rated impulse withstand voltage U_{imp}	kV	6; 3UF7103 and 3UF7104: 8				
Rated frequency	Hz	50/60				
Type of current		Three-phase current				
Short circuit		Additional short-circuit protection is required in the main circuit				
Accuracy of current measurement (in the range of 1 x minimum current setting I_u to 8 x max. current setting I_o)	%	± 3 (typical)				
Digital modules or multifunction modules						
Type		3UF7300, 3UF7310, 3UF7600				
Control circuit						
Rated insulation voltage U_i	V	300 (at pollution degree 3)				
Rated impulse withstand voltage U_{imp}	kV	4				
Relay outputs		2 monostable or bistable relay outputs (depending on the version)				
<ul style="list-style-type: none">• Number• Specified short-circuit protection for auxiliary contacts (relay outputs)<ul style="list-style-type: none">- Fuse links- Miniature circuit breakers• Rated uninterrupted current• Rated switching capacity<ul style="list-style-type: none">- AC-15- DC-13	A	6 A operational class gG; 10 A quick-response (IEC 60947-5-1) 1.6 A, C characteristic (IEC 60947-5-1); 6 A, C characteristic (I_k < 500 A) 6 6 A/24 V AC; 6 A/120 V AC; 3 A/230 V AC 2 A/24 V DC; 0.55 A/60 V DC; 0.25 A/125 V DC				
Inputs (binary)		4 inputs, electrically isolated, supplied externally with 24 V DC or 110 ... 240 V AC/DC depending on the version, connected to a common potential				
Ground-fault modules or multifunction modules						
Type		3UF7510, 3UF7600				
Control circuit						
Connectable residual-current transformer		3UL23				
Type of current for monitoring		Type A (AC and pulsating DC residual currents)				
Adjustable response value		30 mA ... 40 A				
Relative measurement error	%	7.5				
Temperature modules or multifunction modules						
Type		3UF7600, 3UF7700				
Sensor circuit						
Number of temperature sensors		3 temperature sensors 1 temperature sensor				
Typical sensor current		1 0.2				
<ul style="list-style-type: none">• Pt100• Pt1000/KTY83/KTY84/NTC	mA mA					
Open-circuit/short-circuit detection		Pt100/Pt1000 KTY83-110 KTY84 NTC				
<ul style="list-style-type: none">• Sensor type- Open circuit- Short circuit- Measuring range	°C	✓ ✓ -50 ... +500	✓ ✓ -50 ... +175	✓ ✓ -40 ... +300	-- ✓ 80 ... 160	
Measuring accuracy at 20 °C ambient temperature (T20)	K	< ± 2				
Deviation due to ambient temperature (in % of measuring range)	%	0.05 per K deviation from T20				
Conversion time	ms	500				
Connection type		Two- or three-wire connection				

✓

 Detection possible

--

 Detection not possible

- ✓ Detection possible
 -- Detection not possible

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

Analog module					
Type	3UF74				
Control circuit					
Inputs					
• Channels	mA	2 (passive)			
• Parameterizable measuring ranges		0/4 ... 20			
• Shielding	mA	Up to 30 m shield recommended, from 30 m shield required			
• Max. input current (destruction limit)		40			
• Accuracy	%	± 1			
• Input resistance	Ω	50			
• Conversion time	ms	150			
• Resolution	Bit	12			
• Open-circuit detection		With measuring range 4 ... 20 mA			
Outputs					
• Channels	mA	1			
• Parameterizable output range		0/4 ... 20			
• Shielding	V DC	Up to 30 m shield recommended, from 30 m shield required			
• Max. voltage at output		30			
• Accuracy	%	± 1			
• Max. output load	Ω	500			
• Conversion time	ms	25			
• Resolution	Bit	12			
• Short-circuit proof		Yes			
Connection type	Two-wire connection				
Electrical separation of inputs/output to the device electronics	No				
Fail-safe digital modules					
Type	3UF7320-1AB00-0		3UF7320-1AU00-0	3UF7330-1AB00-0	3UF7330-1AU00-0
Control circuit					
Rated control supply voltage U_s	V	24 DC	110 ... 240 AC/DC; 50/60 Hz	24 DC	110 ... 240 AC/DC; 50/60 Hz
Power consumption		3 W	9.5 VA/4.5 W	4 W	11 VA/5.5 W
Rated insulation voltage	V	300			
Rated impulse withstand voltage U_{imp}	kV	4			
Relay outputs					
• Number		2 relay enabling circuits, 2 relay outputs			
Version of the fuse link	A	4, operational class gG			
For short-circuit protection of the relay enabling circuit					
Rated uninterrupted current	A	5			
Rated switching capacity					
• AC-15		3 A/24 V AC; 3 A/120 V AC; 1.5 A/230 V AC			
• DC-13		4 A/24 V DC; 0.55 A/60 V DC; 0.22 A/125 V DC			
Inputs (binary)		5 (with internal power supply from the device electronics)			
Cable length					
• Between sensor/start signal and evaluation electronics	m	1 500	1 500	--	--
• For further digital signals	m	--	--	300	300
Safety data ¹⁾					
SIL level max. according to IEC 61508		3			
Achievable performance level PL according to EN ISO 13849-1		e			
Achievable category according to EN ISO 13849-1		4			
Stop category according to EN 60204-1		0			
Probability of a dangerous failure for SIL 3 applications					
• Per hour (PFH _d) at a high demand rate according to IEC 62061	1/h	1.0 x 10 ⁻⁸ for 2-channel sensor evaluation		1.0 x 10 ⁻⁸	
• Per hour (PFD _{avg}) at a low demand rate according to IEC 61508		2.0 x 10 ⁻⁶ for 2-channel sensor evaluation		2.0 x 10 ⁻⁶	
T1 value for proof test interval or service duration according to IEC 61508	a	20			

¹⁾ For more safety data, see System Manual "SIMOCODE pro Safety Fail-Safe Digital Modules".

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

General data

More information

Configuration instructions

When using an operator panel with display, please note that the type and number of expansion modules that can be connected are limited for the use of a SIMOCODE pro V PROFIBUS basic unit (with product version lower than E15) or SIMOCODE pro V Modbus RTU (with product version lower than E03), [see](#)

- [TIA Selection Tool](#)
- [SIMOCODE pro Manual Collection](#)

Protective separation

All circuits in SIMOCODE pro are safely isolated from each other in accordance with IEC 60947-1. That is, they are designed with double creepages and clearances. In the event of a fault, therefore, no parasitic voltages can be formed in neighboring circuits. The instructions of test log No. 2668 must be complied with.

Types of protection EEx e and EEx d

The overload protection and the thermistor motor protection of the SIMOCODE pro system comply with the requirements for overload protection of explosion-proof motors to the type of protection:

- EEx d "Flameproof enclosure" e.g. according to IEC 60079-1
- EEx e "Increased safety" e.g. according to IEC 60079-7

When using SIMOCODE pro devices with a 24 V DC control voltage, electrical separation must be ensured using a battery or a safety transformer according to IEC 61558-2-6.

EC type test certificate: BVS 06 ATEX F 001

Test report: BVS PP 05.2029 EC.

Type of protection Ex b

The function for dry-running protection of centrifugal pumps in hazardous areas complies with the requirements of the following type of protection:

- Ex b "Control of ignition source", ignition protection system b1, e.g. according to EN 80079-37








SIMOCODE pro is registered for the dry-running protection of centrifugal pumps by means of active power monitoring according to both ATEX and IEC Ex.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

Basic units **IE3/IE4 ready**

Selection and ordering data







Version	SD	Screw terminals		PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU			
SIMOCODE pro PROFIBUS						
	3UF7000-1AB00-0	SIMOCODE pro C PROFIBUS DP interface, 12 Mbps, RS 485 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs Rated control supply voltage U_s : • 24 V DC • 110 ... 240 V AC/DC				
		▶ 3UF7000-1AB00-0 ▶ 3UF7000-1AU00-0		1 1	1 unit 1 unit	42J 42J
	3UF7020-1AU01-0	SIMOCODE pro S PROFIBUS DP interface, 1.5 Mbps, RS 485 4 I/2 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by a multifunction module Note: The connection cable to the current measuring module must be at least 15 cm. Rated control supply voltage U_s : • 24 V DC • 110 ... 240 V AC/DC				
		▶ 3UF7020-1AB01-0 ▶ 3UF7020-1AU01-0		1 1	1 unit 1 unit	42J 42J
	3UF7010-1AB00-0	SIMOCODE pro V¹⁾ PROFIBUS DP interface, 12 Mbps, RS 485 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion modules Rated control supply voltage U_s : • 24 V DC • 110 ... 240 V AC/DC				
		▶ 3UF7010-1AB00-0 ▶ 3UF7010-1AU00-0		1 1	1 unit 1 unit	42J 42J
SIMOCODE pro PROFINET						
	3UF7011-1AB00-1	SIMOCODE pro V PROFINET GP NEW ETHERNET/PROFINET IO, OPC UA server and web server, 100 Mbps, PROFINET system redundancy, 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion module, web server in German/English/Chinese/Russian <u>2 x connection to bus through RJ45,</u> Media Redundancy Protocol Rated control supply voltage U_s : • 24 V DC • 110 ... 240 V AC/DC				
		▶ 3UF7011-1AB00-1 ▶ 3UF7011-1AU00-1		1 1	1 unit 1 unit	42J 42J
	3UF7011-1AB00-0	<u>1 x connection to bus through RJ45,</u> Rated control supply voltage U_s : • 24 V DC • 110 ... 240 V AC/DC				
		▶ 3UF7011-1AB00-2 ▶ 3UF7011-1AU00-2		1 1	1 unit 1 unit	42J 42J
	3UF7011-1AB00-0	SIMOCODE pro V PROFINET ETHERNET/PROFINET IO, OPC UA server and web server, 100 Mbps, 2 x connection to bus through RJ45, PROFINET system redundancy, media redundancy protocol, 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion modules, web server in German/English/Chinese/Russian Rated control supply voltage U_s : • 24 V DC • 110 ... 240 V AC/DC				
		▶ 3UF7011-1AB00-0 ▶ 3UF7011-1AU00-0		1 1	1 unit 1 unit	42J 42J

¹⁾ For the use of 2nd-generation current/voltage measuring modules, SIMOCODE pro V PROFIBUS with product version E15 (V4.0) must be ordered. This version does not have an NEPSI certificate. It can be ordered at no extra charge. The article number must be supplemented by "-Z" and the order code "B01", e.g. **3UF7010-1AB00-0 -Z B01**.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

IE3/IE4 ready **Basic units**

Version		SD	Screw terminals			PU (UNIT, SET, M)	PS*	PG
		d	Article No.	Price per PU				
SIMOCODE pro Modbus RTU								
	SIMOCODE pro V Modbus RTU¹⁾⁵⁾							
	Modbus RTU interface, 57.6 Kbps, RS 485, 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion modules							
	Rated control supply voltage U_s :							
	• 24 V DC	►	3UF7012-1AB00-0		1	1 unit	42J	
	• 110 ... 240 V AC/DC	►	3UF7012-1AU00-0		1	1 unit	42J	
3UF7012-1A.00-0								
SIMOCODE pro EtherNet/IP								
	SIMOCODE pro V EtherNet/IP¹⁾							
	EtherNet/IP interface, web server, 100 Mbps, 2 x connection to bus through RJ45, DLR media redundancy, 4 I/3 O freely assignable, input for thermistor connection, monostable relay outputs, can be expanded by expansion modules, web server in German/English/Chinese/Russian							
	Rated control supply voltage U_s :							
	• 24 V DC	►	3UF7013-1AB00-0		1	1 unit	42J	
	• 110 ... 240 V AC/DC	►	3UF7013-1AU00-0		1	1 unit	42J	
3UF7013-1AB00-0								
SIMOCODE pro current or current/voltage measuring modules								
	Current measuring modules							
	• Straight-through transformers	0.3 ... 3 45 2.4 ... 25 45	►	3UF7100-1AA00-0	1	1 unit	42J	
			►	3UF7101-1AA00-0	1	1 unit	42J	
		10 ... 100 55	►	3UF7102-1AA00-0	1	1 unit	42J	
		20 ... 200 120	►	3UF7103-1AA00-0	1	1 unit	42J	
	• Busbar connection ⁶⁾	20 ... 200 120	►	3UF7103-1BA00-0	1	1 unit	42J	
		63 ... 630 145	►	3UF7104-1BA00-0	1	1 unit	42J	
3UF7103-1AA00-0								
	2nd-generation current/voltage measuring modules for SIMOCODE pro V¹⁾²⁾							
	Voltage measuring up to 690 V, measured values with increased accuracy, power, power factor and frequency monitoring							
	• Straight-through transformers	0.3 ... 4 45 3 ... 40 45	►	3UF7110-1AA01-0	1	1 unit	42J	
		►	3UF7111-1AA01-0	1	1 unit	42J		
		10 ... 115 55	►	3UF7112-1AA01-0	1	1 unit	42J	
		20 ... 200 120	►	3UF7113-1AA01-0	1	1 unit	42J	
	• Busbar connection ⁶⁾	20 ... 200 120	►	3UF7113-1BA01-0	1	1 unit	42J	
		63 ... 630 145	►	3UF7114-1BA01-0	1	1 unit	42J	
3UF7110-1AA01-0								
	Current/voltage measuring modules for dry-running protection of centrifugal pumps in hazardous areas²⁾³⁾⁴⁾ NEW							
	• Straight-through transformers	0.3 ... 4 45 3 ... 40 45	►	3UF7120-1AA01-0	1	1 unit	42J	
			►	3UF7121-1AA01-0	1	1 unit	42J	
		10 ... 115 55	►	3UF7122-1AA01-0	1	1 unit	42J	
		20 ... 200 120	►	3UF7123-1AA01-0	1	1 unit	42J	
	• Busbar connection ⁶⁾	20 ... 200 120	►	3UF7123-1BA01-0	1	1 unit	42J	
		63 ... 630 145	►	3UF7124-1BA01-0	1	1 unit	42J	
3UF7123-1AA01-0								

¹⁾ The SIMOCODE ES (TIA Portal) V14 software or higher is necessary for parameterization, see page 14/12.

²⁾ When installing the basic unit on a current/voltage measuring module, the connection cable must be at least 15 cm long.

³⁾ The current/voltage measuring modules for dry-running protection require SIMOCODE pro V PROFIBUS basic units as of product version E16 (expected to be available from 03/2019), SIMOCODE pro V PROFINET as of product version E13 (expected to be available from 10/2018) or SIMOCODE pro V EtherNet/IP as of product version E04 (expected to be available from 03/2019).

⁴⁾ When using an operator panel with display with the current/voltage measuring modules for dry-running protection, an operator panel with display as of product version E03 (both versions 3UF7210-1AA01-0 and 3UF7210-1BA01-0 expected to be available from 03/2019) is required.

⁵⁾ For the use of 2nd-generation current/voltage measuring modules, SIMOCODE pro V Modbus RTU with product version E03 (V2.0) must be ordered. This version does not have an NEPSI certificate. It can be ordered at no extra charge. The article number must be supplemented by "-Z" and the order code "B01", e.g. 3UF7012-1AB00-0-Z B01.

⁶⁾ One terminal parts kit 3RT1955-4PA00 or 3RT1966-4PA00 (see page 10/24) is included in the scope of delivery for connection to a contactor.



Note:

SIMOCODE pro V basic unit in a hardened version via SIPLUS extreme upon request.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

Basic units **IE3/IE4 ready**






Version	Current setting	Width	SD	Screw terminals	⊕	PU (UNIT, SET, M)	PS*	PG
	A	mm	d	Article No.	Price per PU			
SIMOCODE pro operator panels								
Operator panels Installation in control cabinet door or front plate, for plugging into all SIMOCODE pro basic units, ten LEDs for status indication and user-assignable buttons for controlling the motor, titanium gray				▶ 3UF7200-1AA01-0		1	1 unit	42J
 3UF7200-1AA01-0								
Operator panels with display for SIMOCODE pro V Installation in control cabinet door or front plate, for plugging into SIMOCODE pro V, seven LEDs for status indication and user-assignable buttons for controlling the motor, multilingual display, e.g. for indication of measured values, status information or fault messages, titanium gray								
• English/German/French/Spanish/Portuguese/Italian/Polish/Finnish				▶ 3UF7210-1AA01-0		1	1 unit	42J
• English/Chinese/Russian/Korean				▶ 3UF7210-1BA01-0		1	1 unit	42J
 3UF7210-1.A01-0								

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

Expansion modules

Selection and ordering data

Version	SD	Screw terminals		PU (UNIT, SET, M)	PS*	PG														
	d	Article No.	Price per PU																	
Expansion modules for SIMOCODE pro V																				
<p>With SIMOCODE pro V, it is possible to expand the type and number of inputs and outputs in steps. Each expansion module has two system interfaces on the front. Through the one system interface the expansion module is connected to the system interface of the SIMOCODE pro V using a connection cable; through the second system interface, further expansion modules or the operator panel can be connected. The power supply for the expansion modules is provided by the connection cable through the basic unit.</p> <p>Notes:</p> <p>The SIMOCODE pro V PN GP basic unit can be used with the 3UF7300-1A.00-0 monostable digital module, the 3UF7510-1AA00-0 ground-fault module, or the 3UF7700-1AA00-0 temperature module.</p> <p>Please order connection cable separately, see page 10/22.</p>																				
	3UF7300-1AB00-0																			
<p>Digital modules</p> <p>Up to two digital modules can be used to add additional binary inputs and relay outputs to the basic unit. The input circuits of the digital modules are supplied from an external power supply.</p> <p>Four binary inputs and two relay outputs, up to two digital modules can be connected</p>																				
<table><tr><th>Relay outputs</th><th>Input voltage</th><td></td></tr><tr><td>Monostable</td><td>24 V DC</td><td>▶ 3UF7300-1AB00-0</td></tr><tr><td></td><td>110 ... 240 V AC/DC</td><td>▶ 3UF7300-1AU00-0</td></tr><tr><td>Bistable</td><td>24 V DC</td><td>▶ 3UF7310-1AB00-0</td></tr><tr><td></td><td>110 ... 240 V AC/DC</td><td>▶ 3UF7310-1AU00-0</td></tr></table>		Relay outputs	Input voltage		Monostable	24 V DC	▶ 3UF7300-1AB00-0		110 ... 240 V AC/DC	▶ 3UF7300-1AU00-0	Bistable	24 V DC	▶ 3UF7310-1AB00-0		110 ... 240 V AC/DC	▶ 3UF7310-1AU00-0	1	1 unit	42J	
Relay outputs	Input voltage																			
Monostable	24 V DC	▶ 3UF7300-1AB00-0																		
	110 ... 240 V AC/DC	▶ 3UF7300-1AU00-0																		
Bistable	24 V DC	▶ 3UF7310-1AB00-0																		
	110 ... 240 V AC/DC	▶ 3UF7310-1AU00-0																		
<p>Analog modules</p> <p>By means of the analog module, the basic unit can be optionally expanded by analog inputs and outputs (0/4 ... 20 mA).</p> <p>Two inputs (passive) for input and one output for output of 0/4 ... 20 mA signals, max. one analog module can be connected per pro V PB/MB RTU basic unit and max. two analog modules per pro V PN/EIP basic unit</p>		▶ 3UF7400-1AA00-0	1	1 unit	42J															
	3UF7400-1AA00-0																			
<p>Ground-fault modules</p> <p>Ground-fault monitoring using 3UL23 residual-current transformers and ground-fault modules is used in cases where precise detection of the ground-fault current is required or power systems with high impedance are grounded.</p> <p>With the ground-fault module, it is possible to determine the precise fault current as a measured value, and to define freely selectable warning and trip limits in a wide range from 30 mA ... 40 A.</p> <p>One input for connecting a 3UL23 residual-current transformer, up to one ground-fault module can be connected</p> <p>Note:</p> <p>For corresponding residual-current transformers, see page 10/94.</p>		▶ 3UF7510-1AA00-0	1	1 unit	42J															
	3UF7510-1AA00-0																			
<p>Temperature modules</p> <p>Irrespective of the thermistor motor protection of the basic units, up to an additional three analog temperature sensors can be evaluated using a temperature module.</p> <p>Sensor types: Pt100/Pt1000, KTY83/KTY84 or NTC</p> <p>Three inputs for connecting up to three analog temperature sensors, up to one temperature module can be connected per pro V PB/MB RTU basic unit and up to two temperature modules per pro V PN/EIP basic unit</p>		▶ 3UF7700-1AA00-0	1	1 unit	42J															
	3UF7700-1AA00-0																			

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

Expansion modules

Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU		
Expansion modules for SIMOCODE pro S					
<p>With SIMOCODE pro S, it is possible to expand the type and number of inputs and outputs. The expansion module has two system interfaces on the front. Through the one system interface the expansion module is connected to the system interface of the SIMOCODE pro S using a connection cable; through the second system interface, the operator panel can be connected. The power supply for the expansion module is provided by the connection cable through the basic unit.</p> <p><u>Note:</u> Please order connection cable separately, see page 10/22.</p>					
<p>Multifunction modules</p> <p>The multifunction module is the expansion module of the SIMOCODE pro S device series with the following functions:</p> <ul style="list-style-type: none"> • Digital module function with four digital inputs and two monostable relay outputs • Ground-fault module function with an input for the connection of a 3UL23 residual-current transformer with freely selectable warning and trip limits in a wide zone of 30 mA ... 40 A • Temperature module function with an input for connecting an analog temperature sensor Pt100, Pt1000, KTY83, KTY84, or NTC <p>Max. one multifunction module can be connected per pro S basic unit</p> <p>Input voltage of the digital inputs:</p> <ul style="list-style-type: none"> • 24 V DC • 110 ... 240 V AC/DC 					
		▶ 3UF7600-1AB01-0	1	1 unit	42J
		▶ 3UF7600-1AU01-0	1	1 unit	42J




3UF7600-1AU01-0

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

Fail-safe expansion modules

Selection and ordering data

Version	SD	Screw terminals		PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU			

Fail-safe expansion modules for SIMOCODE pro V

Thanks to the fail-safe expansion modules, SIMOCODE pro V can be expanded with the function of a safety relay for the fail-safe disconnection of motors. A maximum of one fail-safe digital module can be connected; it can be used instead of a digital module.

The fail-safe expansion modules are equipped likewise with two system interfaces at the front for making the connection to other system components. Unlike other expansion modules, power is supplied to the modules through a separate terminal connection.

Note:

Please order connection cable separately, [see page 10/22](#).

DM-F Local fail-safe digital modules

For fail-safe disconnection using a hardware signal

Two relay enabling circuits, joint switching; two relay outputs, common potential disconnected fail-safe; inputs for sensor circuit, start signal, cascading and feedback circuit, safety function adjustable using DIP switches

Rated control supply voltage U_s :

- 24 V DC
- 110 ... 240 V AC/DC

▶ 3UF7320-1AB00-0	1	1 unit	42J
▶ 3UF7320-1AU00-0	1	1 unit	42J

DM-F PROFIsafe fail-safe digital modules¹⁾

For fail-safe disconnection using PROFIBUS/PROFIsafe or PROFINET/PROFIsafe

Two relay enabling circuits, joint switching; two relay outputs, common potential disconnected fail-safe; one input for feedback circuit; three binary standard inputs

Rated control supply voltage U_s :

- 24 V DC
- 110 ... 240 V AC/DC

▶ 3UF7330-1AB00-0	1	1 unit	42J
▶ 3UF7330-1AU00-0	1	1 unit	42J



3UF7320-1AB00-0



3UF7330-1AB00-0






¹⁾ Cannot be used in conjunction with SIMOCODE pro V for Modbus RTU or EtherNet/IP communication.

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

Accessories

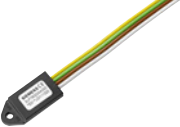


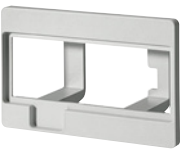


Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	
d							
Connection cables (essential accessory)							
 3UF7932-0AA00-0	In different lengths for connecting basic unit, current measuring module, current/voltage measuring module, operator panel or expansion modules						
	Version	Length					
	Flat	0.025 m	▶	3UF7930-0AA00-0	1	1 unit	42J
		0.1 m	▶	3UF7931-0AA00-0	1	1 unit	42J
		0.15 m	▶	3UF7934-0AA00-0	1	1 unit	42J
		0.3 m	▶	3UF7935-0AA00-0	1	1 unit	42J
		0.5 m	▶	3UF7932-0AA00-0	1	1 unit	42J
	Round	0.5 m	▶	3UF7932-0BA00-0	1	1 unit	42J
		1.0 m	▶	3UF7937-0BA00-0	1	1 unit	42J
		2.5 m	▶	3UF7933-0BA00-0	1	1 unit	42J
PC cables and adapters							
 3UF7941-0AA00-0	USB PC cables		▶	3UF7941-0AA00-0	1	1 unit	42J
	For connecting to the USB interface of a PC/PG, for communication with SIMOCODE pro through the system interface						
	5	USB/serial adapters	▶	3UF7946-0AA00-0	1	1 unit	42J
For connecting an RS 232 PC cable to the USB interface of a PC							
Memory modules							
 3UF7901-0AA01-0	Enable transmission to a new system, e.g. when a device is replaced, without the need for additional aids or detailed knowledge of the device.						
	Memory modules for SIMOCODE pro C		▶	3UF7900-0AA01-0	1	1 unit	42J
	For saving the complete parameterization of a SIMOCODE pro C system, titanium gray						
	Memory modules for SIMOCODE pro S and pro V		▶	3UF7901-0AA01-0	1	1 unit	42J
For saving the complete parameterization of a SIMOCODE pro system, titanium gray							
Interface covers							
 3RA6936-0B	For system interface, titanium gray		10	3RA6936-0B	1	5 units	42F
Addressing plugs							
 3UF7910-0AA00-0	For assigning the PROFIBUS or Modbus RTU address without using a PC/PG to SIMOCODE pro through the system interface		▶	3UF7910-0AA00-0	1	1 unit	42J

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

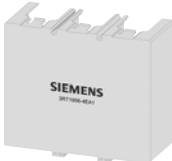

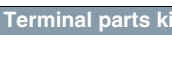





Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Accessories for motor control centers						
 3UF7902-0AA00-0	With the draw-out technology often used in motor control centers it is possible to integrate a SIMOCODE pro initialization module in the switchboard on a permanent basis. Feeder-related parameter and address data can then be permanently assigned to this feeder.					
		Initialization modules				
		For automatic parameterization of SIMOCODE pro S and SIMOCODE pro V basic units (pro V PROFIBUS basic units from product version E09)				
		Y connection cables				
For use in conjunction with the initialization module; connects the basic unit, current measuring module or current/voltage measuring module, and initialization module						
	System interface length	Open cable end				
	0.1 m	1.0 m				
	0.5 m	1.0 m				
	1.0 m	1.0 m				
Bus connection terminals						
 3UF7960-0AA00-0	For shield support and strain relief of the PROFIBUS cable on a SIMOCODE pro S					
		3UF7960-0AA00-0				
Door adapters						
 3UF7920-0AA00-0	For external connection of the system interface, e.g. outside a control cabinet					
		3UF7920-0AA00-0				
Adapters for operator panel						
 3UF7922-0AA00-0	The adapter enables the smaller 3UF7200 operator panel from SIMOCODE pro to be used in a front panel cutout in which previously, e.g. after a change of system, a larger 3UF52 operator panel from SIMOCODE-DP had been used, degree of protection IP54					
		3UF7922-0AA00-0				
Labeling strips						
 3UF7925-0AA02-0	• For pushbuttons of the 3UF720 operator panel					
		3UF7925-0AA00-0				
		3UF7925-0AA01-0				
		3UF7925-0AA02-0				
Push-in lugs						
 3RV2928-0B	For screw fixing, e.g. on mounting plate, 2 units required per device					
		3RV2928-0B				
		3RP1903				
		3ZY1311-0AA00				

SIMOCODE 3UF Motor Management and Control Devices

SIMOCODE pro 3UF7 Motor Management and Control Devices

Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	
d							
Terminal covers							
	Covers for cable lugs and busbar connections						
	• Length 100 mm, can be used for 3UF71.3-1BA0.-0	►	3RT1956-4EA1	1	1 unit	41B	
	• Length 120 mm, can be used for 3UF71.4-1BA0.-0	2	3RT1966-4EA1	1	1 unit	41B	
	Covers for box terminals						
	• Length 25 mm, can be used for 3UF71.3-1BA0.-0	►	3RT1956-4EA2	1	1 unit	41B	
	• Length 30 mm, can be used for 3UF71.4-1BA0.-0	2	3RT1966-4EA2	1	1 unit	41B	
	Covers for screw terminals						
	Between contactor and current measuring module or current/voltage measuring module for direct mounting						
	• Can be used for 3UF71.3-1BA0.-0	►	3RT1956-4EA3	1	1 unit	41B	
	• Can be used for 3UF71.4-1BA0.-0	2	3RT1966-4EA3	1	1 unit	41B	
	Terminal parts kit						
	Can be used for current and/or current/voltage measuring modules with standard mounting rail connection, complete for one contactor						
	• M 8 x 25	5	3RT1955-4PA00	1	1 unit	41B	
	• M 10 x 30	5	3RT1966-4PA00	1	1 unit	41B	
	Box terminal blocks						
	For round and ribbon cables						
	• Up to 70 mm ² , can be used for 3UF71.3-1BA0.-0	►	3RT1955-4G	1	1 unit	41B	
	• Up to 120 mm ² , can be used for 3UF71.3-1BA0.-0	►	3RT1956-4G	1	1 unit	41B	
	• Up to 240 mm ² , can be used for 3UF71.4-1BA0.-0	►	3RT1966-4G	1	1 unit	41B	
	Bus termination modules						
	With separate control supply voltage for bus termination following the last unit on the bus line						
	Supply voltage:						
	• 115/230 V AC	5	3UF1900-1KA00	1	1 unit	42J	
	• 24 V DC	5	3UF1900-1KB00	1	1 unit	42J	
Software							
	SIMOCODE ES (TIA Portal) NEW						
	Software for configuring, commissioning, operating and diagnosing SIMOCODE pro based on the TIA Portal, see page 14/12.						
	SIMOCODE pro block library for SIMATIC PCS 7						
	The PCS 7 block library can be used for simple and easy integration of SIMOCODE pro into the SIMATIC PCS 7 process control system, see page 14/16.						

SIMOCODE 3UF Motor Management and Control Devices

3UF18 current transformers for overload protection



Overview

More information

Homepage, see www.siemens.com/siriusIndustry Mall, see www.siemens.com/product?3UF18

The 3UF18 current transformers are protection transformers and are used for actuating overload relays. Protection transformers are designed to ensure proportional current transfer up to a multiple of the primary rated current. The 3UF18 current transformers convert the maximum current of the corresponding operating range into the standard value of 1 A secondary.

Selection and ordering data

Type of mounting	Operating range	SD	Screw terminals 	PU (UNIT, SET, M)	PS*	PG
	A	d	Article No. Price per PU			
For mounting onto contactors and stand-alone installation						
 3UF1868	Screw fixing	205 ... 820	X	3UF1868-3GA00	1	1 unit 42J

Accessories

For contactor type	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Terminal covers						
For transformer/contactor combinations and stand-alone installation for 3UF1868-3GA00 transformer	5	3TX7696-0A		1	1 unit	41B
<u>Note:</u> One cover required per connection side.						

LOGO! Logic Modules

General data

Overview



LOGO! logic modules

More information

Homepage, see www.siemens.com/LOGO

Industry Mall, see www.siemens.com/product?logo

LOGO!, see [Catalog ST 70](#)

To download brochures, see www.siemens.com/simatic/printmaterial

- The compact, user-friendly, and low-cost solution for simple control tasks
- Compact, user-friendly, can be used universally without accessories
- All in one: The display and operator panel are integrated
- 36 different functions can be linked at a press of a button or with PC software; up to 130 times in total
- LOGO! 8: 38/43 different functions can be linked at a press of a button or with PC software; up to 200/400 times in total
- Functions can be changed simply with the press of a button. No complicated rewiring

Application

The LOGO! logic module is the user-friendly, low-cost solution for simple control tasks.

LOGO! is universally applicable, e.g.:

- Building installation and wiring (lighting, shutters, awnings, doors, access control, barriers, ventilation systems, etc.)
- Control cabinet installation
- Machine and device construction (pumps, small presses, compressors, hydraulic lifts, conveyors, etc.)
- Special controls for conservatories and greenhouses
- Signal preprocessing for other controllers

LOGO! Modular logic modules can be expanded easily for each application.

Marine approvals

American Bureau of Shipping, Bureau Veritas, Det Norske Veritas, Germanischer Lloyd, Lloyds Register of Shipping, Polski Rejestr Statków, etc.

Overview



LOGO! basic module with display

- The space-saving basic versions
- Interface for connecting expansion modules, max. 24 digital inputs, 20 digital outputs, 8 analog inputs and 8 analog outputs can be addressed
- All basic units with integrated web server
- Enclosure width 72 mm (4 MW)
- All basic units with Ethernet interface for communication with LOGO! 8, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro SD cards

Selection and ordering data

Version	SD	Screw terminals	⊕	PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU			
LOGO! 8 logic modules						
LOGO! logic modules 24CE Control supply voltage 24 V DC, 8 digital inputs 24 V DC, of which 4 can be used as analog inputs (0 ... 10 V), 4 digital outputs 24 V DC, 0.3 A, with integrated time switch, Ethernet interface, 400 function blocks can be combined, modular expandability	1	6ED1052-1CC08-0BA0		1	1 unit	200
LOGO! logic modules 12/24RCE Control supply voltage 12 ... 24 V DC, 8 digital inputs 12/24 V DC, of which 4 can be used as analog inputs (0 ... 10 V), 4 relay outputs 10 A, integrated time switch, Ethernet interface, 400 function blocks can be combined, modular expandability	1	6ED1052-1MD08-0BA0		1	1 unit	200
LOGO! logic modules 24RCE Control supply voltage 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface, 400 function blocks can be combined, modular expandability	1	6ED1052-1HB08-0BA0		1	1 unit	200
LOGO! logic modules 230RCE Control supply voltage 115 ... 230 V AC/DC, 8 digital inputs 115 ... 230 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface, 400 function blocks can be combined, modular expandability	1	6ED1052-1FB08-0BA0		1	1 unit	200

For accessories, see page 10/34 onwards.

LOGO! Logic Modules

LOGO! basic modules without display

Overview



LOGO! basic module without display

- The cost-optimized basic versions
- Interface for connecting expansion modules, max. 24 digital inputs, 20 digital outputs, 8 analog inputs and 8 analog outputs can be addressed
- With connection option for LOGO! TDE text display
- All basic units with integrated web server
- Enclosure width 72 mm (4 MW)
- All basic units with Ethernet interface for communication with LOGO! 8, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro SD cards

Selection and ordering data

Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU		
LOGO! 8 logic modules					
LOGO! logic modules 24CEo Control supply voltage 24 V DC, 8 digital inputs 24 V DC, of which 4 can be used as analog inputs (0 ... 10 V), 4 digital outputs 24 V DC, 0.3 A; integrated time switch, Ethernet interface, without display or keyboard, 400 function blocks can be combined, modular expandability	1	6ED1052-2CC08-0BA0		1	1 unit 200
LOGO! logic modules 12/24RCEo Control supply voltage 12 ... 24 V DC, 8 digital inputs 12 ... 24 V DC, of which 4 can be used as analog inputs (0 ... 10 V), 4 relay outputs 10 A, integrated time switch, Ethernet interface, without display or keyboard, 400 function blocks can be combined, modular expandability	1	6ED1052-2MD08-0BA0		1	1 unit 200
LOGO! logic modules 24RCEo Control supply voltage 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface, without display or keyboard, 400 function blocks can be combined, modular expandability	1	6ED1052-2HB08-0BA0		1	1 unit 200
LOGO! logic modules 230RCEo Control supply voltage 115 ... 230 V AC/DC, 8 digital inputs 115 ... 230 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface, without display or keyboard, 400 function blocks can be combined, modular expandability	1	6ED1052-2FB08-0BA0		1	1 unit 200

For accessories, see page 10/34 onwards.

Overview



LOGO! expansion modules

- Expansion modules for connection to LOGO! basic modules
- With digital inputs and outputs, analog inputs or analog outputs

Selection and ordering data

Version	SD	Screw terminals	⊕	PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU			
LOGO! 8 expansion modules						
LOGO! DM8 24 Control supply voltage 24 V DC, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A	1	6ED1055-1CB00-0BA2		1	1 unit	200
LOGO! DM16 24 Control supply voltage 24 V DC, 8 digital inputs 24 V DC, 8 digital outputs 24 V DC, 0.3 A	1	6ED1055-1CB10-0BA2		1	1 unit	200
LOGO! DM8 12/24R Control supply voltage 12 ... 24 V DC, 4 digital inputs 12 ... 24 V DC, 4 relay outputs 5 A	1	6ED1055-1MB00-0BA2		1	1 unit	200
LOGO! DM8 24R Control supply voltage 24 V AC/DC, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A	1	6ED1055-1HB00-0BA2		1	1 unit	200
LOGO! DM16 24R Control supply voltage 24 V DC, 8 digital inputs 24 V DC, 8 relay outputs 5 A	1	6ED1055-1NB10-0BA2		1	1 unit	200
LOGO! DM8 230R Control supply voltage 115 ... 230 V AC/DC, 4 digital inputs 115 ... 230 V AC/DC, 4 relay outputs 5 A	1	6ED1055-1FB00-0BA2		1	1 unit	200
LOGO! DM16 230R Control supply voltage 115 ... 230 V AC/DC, 8 digital inputs 115 ... 230 V AC/DC, 8 relay outputs 5 A	1	6ED1055-1FB10-0BA2		1	1 unit	200
LOGO! AM2 Control supply voltage 12 ... 24 V DC, 2 analog inputs 0 ... 10 V or 0 ... 20 mA, 10-bit resolution	1	6ED1055-1MA00-0BA2		1	1 unit	200
LOGO! AM2 PT 100 Control supply voltage 12 ... 24 V DC, 2 analog inputs Pt100, temperature range -50 °C ... +200 °C	1	6ED1055-1MD00-0BA2		1	1 unit	200
LOGO! AM2 AQ Control supply voltage 24 V DC, 2 analog outputs 0 ... 10 V, 0/4 ... 20 mA	1	6ED1055-1MM00-0BA2		1	1 unit	200

For accessories, see page 10/34 onwards.

LOGO! Logic Modules
LOGO! Communication Modules

LOGO! CMK2000 communication modules

Overview



LOGO! CMK2000 communication modules

- Expansion module for the LOGO! 8 basic versions
- For integration of LOGO! 8 in KNX installations
- 24 digital inputs, 20 digital outputs and 8 analog inputs and outputs each for processing of process signals via KNX

Information regarding compatibility:

LOGO! CMK2000 communication modules can be used with LOGO! ... 0BA8.

Application

With the LOGO! CMK2000 communication modules, the LOGO! 8 logic module series can be integrated in the KNX building system bus.

Designed for small-scale automation solutions, LOGO! 8 can be used in combination with the new communication module for building automation tasks, for example for monitoring, access control, air conditioning, lighting, shading and watering, even extending to pump control.

Selection and ordering data

Version	SD	Screw terminals	⊕	PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU			
LOGO! CMK2000 communication modules						
For integration of LOGO! 8 in the KNX building system bus, max. 50 communication objects can be configured; RJ45 port for Ethernet; supply voltage 24 V DC/40 mA	1	6BK1700-0BA20-0AA0		1	1 unit	470

For accessories, see page 10/34 onwards.

Overview



LOGO! CSM unmanaged

The module is used for the connection of a LOGO! and up to three additional nodes to an Industrial Ethernet network with 10/100 Mbps in an electrical line, tree or star structure.

Key features of the LOGO! CSM are:

- Unmanaged 4-port switch, of which one port on the front side is for simple diagnostics access
- Two versions for the voltage ranges 12/24 V DC or 230 V AC/DC
- It is easy to connect via four RJ45 standard plug-in connections
- Space-saving, optimized for connection to LOGO!
- Economical solution for creating small, local Ethernet networks
- Stand-alone use for networking any number of Ethernet devices

Information regarding compatibility:

LOGO! CSM 12/24 communication modules can be used with LOGO! ...0BA7/...0BA8.

Benefits

- Savings on installation costs and installation space compared to using external network components
- Fast commissioning since configuring is not necessary
- Fast and uncomplicated diagnostics access in the control cabinet
- Flexible expansion of the network thanks to simple connection of the CSM

Application

LOGO! CSM is an Industrial Ethernet switch in a compact, modular design for use in devices of the new LOGO! generation with Industrial Ethernet connection. With the LOGO! CSM, the Ethernet interface of the SIMATIC LOGO! can be multiplied to enable simultaneous communication with control panels, programming devices, other controllers, or the office world.

External access (e.g. for diagnostics purposes) is possible without problems via the four Ethernet ports.

Product versions

LOGO! CSM 12/24 (now in LOGO! 8 design)

For operation with direct current at 12 and 24 volts

Selection and ordering data

Version	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU		
LOGO! CSM compact switch modules					
Unmanaged switch for connection to a LOGO! and up to three additional nodes in the Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; LED diagnostics, LOGO! module					
LOGO! CSM 12/24	1	6GK7177-1MA20-0AA0		1	1 unit 5P1
External 12 V DC or 24 V DC power supply; for LOGO! ...0BA7/...0BA8					

For accessories, [see page 10/34 onwards](#).

More information

Selection Tools:

To assist in selecting the right Industrial Ethernet switches as well as in the configuration of modular variants, the SIMATIC NET Selection Tool and the TIA Selection Tool are available.

SIMATIC NET Selection Tool, [see](#)

www.siemens.com/snst-standalone

TIA Selection Tool, [see](#)

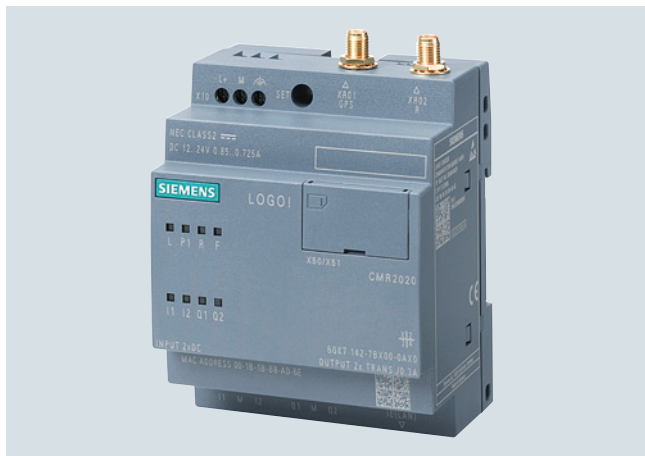
www.siemens.com/tia-selection-tool

LOGO! Logic Modules

LOGO! Communication Modules

LOGO! CMR (mobile wireless communication)

Overview



LOGO! CMR

LOGO! CMR is suitable in combination with the LOGO! logic module as a low-cost remote signaling system for monitoring and controlling distributed plants and systems via text messages or email.

LOGO! CMR can send text messages or emails to predefined mobile network numbers and also receive text messages from predefined mobile network numbers.

Sending a text message/email can be initiated by events in the LOGO! basic module as well as by the two digital alarm inputs of the LOGO! CMR. The values in the LOGO! logic module can be directly influenced by receiving a text message.

The LOGO! CMR offers convenient commissioning and diagnostics via web-based management, via local and/or remote access.

The two digital outputs can also be connected remotely via incoming text messages/emails.

The LOGO! CMR determines the current position of the module using the GPS signal received via the GPS antenna. In addition, the LOGO! 8 logic module can also be synchronized by means of the time-of-day included in the GPS signal.

Further options for synchronizing the LOGO! BM with the current time-of-day are calculation of the time-of-day via an NTP server or from the data of the mobile wireless service provider.

Product versions

- LOGO! CMR2020 for use in GSM/GPRS mobile wireless networks
- LOGO! CMR2040 for use in LTE mobile wireless networks

Information regarding compatibility:

LOGO! CMR2020 and LOGO! CMR2040 can be used with LOGO! ...0BA8.

Caution! Observance of national mobile wireless approvals is mandatory:

- DE: www.siemens.de/mobilfunkzulassungen
- EN: www.siemens.com/mobilenetwork-approvals

Benefits

- Low-cost alarm signaling system – low investment and operating outlay for the monitoring and control of small systems via text message and/or email
- Reduction of travel/maintenance costs thanks to remote access via OpenVPN and HTTP for configuring the LOGO! CMR or LOGO! 8 logic module
- Easy-to-use thanks to intuitive text messaging syntax with alias text messaging function or assignment and use of symbolic names
- Simple configuration process via Web Based Management without the need for special knowledge of radio communications
- Internationally deployable thanks to communication via GSM, UMTS, and LTE networks
- Time synchronization of the LOGO! 8 logic module using the time determined from the GPS signal, an NTP server or the time from the mobile radio provider
- Harmonizes with LOGO! 8 series with regard to functioning, design and structure
- Fast installation thanks to standard rail mounting

Application

In industrial environments

- Simple remote diagnostics and remote control tasks in LOGO! applications in the plant and machine environment, e.g. gate controls, ventilation systems, industrial water pumps, automatic dry feeders in agriculture
- Simple building automation including building equipment, e.g. for HVAC (Heating, Ventilation and Air Conditioning), pump controller
- Remote control and monitoring of, e.g. level, pressure, temperature, flow, and valve control in the water/wastewater industry
- Position monitoring in the logistics industry, e.g. for vehicles, refrigeration transporters, containers
- Simplest possible metering and energy management systems in distributed buildings controlled with LOGO!
- Design of systems for monitoring and controlling simple telecontrol stations
- Remote connection of distributed local controllers via LOGO!

- Remote control and monitoring of low-end machine controls (usually discrete logic)

In non-industrial environments


- Remote control and monitoring of automation tasks in domestic building and installation systems, e.g.
 - Stairway lighting
 - External lighting
 - Awnings, shutters
 - Shop window lighting
- Remote control of HVAC in dwellings, greenhouses, etc.

LOGO! Logic Modules

LOGO! Communication Modules

LOGO! CMR (mobile wireless communication)

Selection and ordering data

Version	SD	Screw terminals		PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU			
LOGO! CMR Communication Module Radio						
Communication modules for connecting LOGO! ...0BA8 to a GSM/GPRS or LTE network; 1 x RJ45 port for Industrial Ethernet connection; 2 x digital input; 2 x digital output; read/write access to LOGO! variables; sending/receiving text messages; GPS position detection; time-of-day synchronization/forwarding with real-time clock; configuration and diagnostics via WEB interface; observe national approval!						
LOGO! CMR2020 For connecting LOGO! ...0BA8 to GSM/GPRS networks	1	6GK7142-7BX00-0AX0		1	1 unit	5P1
LOGO! CMR2040 For connecting LOGO! ...0BA8 to LTE network	5	6GK7142-7EX00-0AX0		1	1 unit	5P1

For accessories, [see page 10/34 onwards](#).

More information

Selection Tools

To assist in selecting the right Industrial Ethernet switches as well as in the configuration of the LOGO! logic module, the TIA Selection Tool is available.

TIA Selection Tool, [see
www.siemens.com/tia-selection-tool](#)

LOGO! Logic Modules

Accessories

Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Accessories for LOGO! 8						
LOGO! TDE text display 6-line text display, can be connected to all LOGO! 8 versions with and without display, including installation accessories <u>Note:</u> Requires additional 12 V DC power supply or 24 V AC/DC power supply.	1	6ED1055-4MH08-0BA0		1	1 unit	200
LOGO! Software						
LOGO!Soft Comfort V8 For programming on the PC in LAD/FBD; runs on Windows 8, 7, XP, Linux and Mac OSX; on DVD	1	6ED1058-0BA08-0YA1		1	1 unit	200
LOGO! 8 Starter Kits						
In TANOS box, with LOGO! 8, LOGO!Soft Comfort V8, WinCC Basic, Ethernet cable						
LOGO! Starter Kit 12/24 RCE With LOGO! 12/24 RCE, power supply, screwdriver, in Systainer	30	6ED1057-3BA01-0AA8		1	1 unit	2SP
LOGO! Starter Kit 230 RCE With LOGO! 230 RCE, power supply, screwdriver, in Systainer	30	6ED1057-3BA03-0AA8		1	1 unit	2SP
LOGO! Starter Kit 12/24 RCEO With LOGO! 12/24 RCEO, LOGO! TD, power supply, screwdriver, in Systainer	30	6ED1057-3BA11-0AA8		1	1 unit	2SP
LOGO! 8 KP300 Basic Starter Kit With LOGO! 12/24 RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN	1	6AV2132-0HA00-0AA1		1	1 unit	2SP
LOGO! 8 KP400 Basic Starter Kit With LOGO! 12/24 RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic	1	6AV2132-0KA00-0AA1		1	1 unit	2SP
LOGO! 8 KTP700 Basic Starter Kit With LOGO! 12/24 RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic	1	6AV2132-3GB00-0AA1		1	1 unit	2SP
Front panel assembly kits						
Front panel assembly kits • Width: 4 MW, with pushbuttons • Width: 8 MW, with pushbuttons	22 22	6AG1057-1AA00-0AA3 6AG1057-1AA00-0AA2		1 1	1 unit 1 unit	470 470
Accessories for LOGO! CSM unmanaged						
SIMATIC NET cables						
IE TP Cord RJ45/RJ45 TP cable 4 x 2 with 2 RJ45 connectors • 0.5 m • 1 m • 2 m • 6 m • 10 m	1 1 1 1 1	6XV1870-3QE50 6XV1870-3QH10 6XV1870-3QH20 6XV1870-3QH60 6XV1870-3QN10		1 1 1 1 1	1 unit 1 unit 1 unit 1 unit 1 unit	5K1 5K1 5K1 5K1 5K1
IE FC Outlet RJ45 For connection of Industrial Ethernet FC cables and TP cords; scaled pricing from 10 and 50 units	1	6GK1901-1FC00-0AA0		1	1 unit	5K1

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Accessories for LOGO! CMR						
Mobile wireless antennas						
ANT794-4MR Resistant in the indoor and outdoor areas; 5 m connection cable permanently connected to the antenna; SMA connector, including mounting bracket, screws, plugs	1	6NH9860-1AA00		1	1 unit	5T1
ANT896-4MA Rod antenna for mounting directly on the device; SMA male connector	1	6GK5896-4MA00-0AA3		1	1 unit	5M2
ANT896-4ME Cylindrical antenna for detached mounting, e.g. on a control cabinet; N-Connect female connector	1	6GK5896-4ME00-0AA0		1	1 unit	5M2
GPS antennas						
ANT895-6ML GPS/Glonass antenna for detached mounting in the indoor and outdoor areas, magnetic holder or screw holder, cable 30 cm with N-Connect female connector	1	6GK5895-6ML00-0AA0		1	1 unit	5M2
Antenna adapter cables						
N-Connect/SMA male/male flexible connection cable, pre-assembled connecting cable; suitable from 0 ... 6 GHz, IP68						
• 0.3 m	1	6XV1875-5LE30		1	1 unit	5M2
• 1 m	1	6XV1875-5LH10		1	1 unit	5M2
• 2 m	1	6XV1875-5LH20		1	1 unit	5M2
• 5 m	1	6XV1875-5LH50		1	1 unit	5M2
IWLAN RCoax/antenna N-Connect male/male flexible connection cables						
Flexible connection cable for connecting an RCoax cable or an antenna to a SCALANCE W-700 access point with N-Connect terminals; assembled with two connectors N-Connect male; suitable from 0 ... 6 GHz, IP68						
• 1 m	1	6XV1875-5AH10		1	1 unit	5W3
• 2 m	1	6XV1875-5AH20		1	1 unit	5W3
• 5 m	1	6XV1875-5AH50		1	1 unit	5W3
• 10 m	1	6XV1875-5AN10		1	1 unit	5W3
Control cabinet bushing IWLAN RCOAX N-Connect/N-Connect female/female panel feedthrough; cabinet bushing for panel thicknesses up to 4.5 mm; 2.4 GHz and 5 GHz, suitable from 0 ... 6 GHz, IP67	1	6GK5798-2PP00-2AA6		1	1 unit	5W3
LP798-2N lightning protector Lightning protector with N/N female/female connector for the antennas ANT 790, IP67 (-40 ... +85 °C), frequency range: 0 ... 6 GHz	1	6GK5798-2LP00-2AA6		1	1 unit	5W3
Patch cables						
IE TP Cord RJ45/RJ45						
TP cable 4 x 2 with 2 RJ45 connectors						
• 0.5 m	1	6XV1870-3QE50		1	1 unit	5K1
• 1 m	1	6XV1870-3QH10		1	1 unit	5K1
• 2 m	1	6XV1870-3QH20		1	1 unit	5K1
• 6 m	1	6XV1870-3QH60		1	1 unit	5K1
• 10 m	1	6XV1870-3QN10		1	1 unit	5K1
IE FC Outlet RJ45 For connection of Industrial Ethernet FC cables and TP cords; scaled pricing from 10 and 50 units	1	6GK1901-1FC00-0AA0		1	1 unit	5K1
Stainless steel enclosure in IP68 degree of protection NEW Stainless steel enclosure in IP68 degree of protection; suitable for SIMATIC RTU3030C; temperature range -60 ... +135 °C; matte surface; cover with Pin Torx screws and padlock; 7 cable openings and opening for mobile radio antenna prepared Please order cable glands and sealing plugs separately in the necessary quantity.	1	6NH3112-3BA00-1XX1		1	1 unit	5T1
Aluminum enclosure in IP68 degree of protection NEW Aluminum enclosure in IP68 degree of protection; suitable for SIMATIC RTU3030C; temperature range -40 ... +80 °C; cover with Pin Torx screws; 7 cable openings and opening for mobile radio antenna prepared Please order cable glands and sealing plugs separately in the necessary quantity.	1	6NH3112-3BA00-1XX3		1	1 unit	5T1
Cable gland PG16 F for IP68 enclosure NEW Cable gland, M16, IP68, -40 ... +100 °C, nickel-plated brass, suitable for enclosures with article numbers 6NH3112-3BA00-1XX1 and 6NH3112-3BA00-1XX3 Pack quantity = 2 units	1	6NH3112-3BA00-1XX4		1	1 unit	5T1
M16 sealing plugs for IP68 enclosure NEW Sealing plug, M16, IP68, -40 to +100 °C; nickel-plated brass, suitable for enclosures with article numbers 6NH3112-3BA00-1XX1 and 6NH3112-3BA00-1XX3 pack quantity = 2 units	1	6NH3112-3BA00-1XX5		1	1 unit	5T1

LOGO! Logic Modules

LOGO!Contact

Overview



LOGO!Contact

Switching module for switching resistive loads and motors directly


Application

LOGO!Contact is a switching module for direct switching of resistive loads (up to 20 A) and motors (up to 4 kW). LOGO!Contact operates hum-free without noise pollution.

LOGO!Contact is universally applicable:

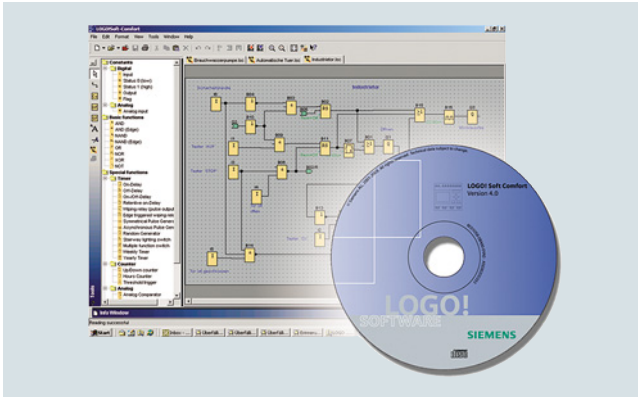
- Buildings/electrical installations
- Industry and commerce

Selection and ordering data

Version	SD	Screw terminals		PU (UNIT, SET, M)	PS*	PG
	d	Article No.	Price per PU			
LOGO!Contact						
Switching module for direct switching of resistive loads up to 20 A and motors up to 4 kW						
Switching voltage:						
• 24 V		1	6ED1057-4CA00-0AA0	1	1 unit	200
• 230 V		1	6ED1057-4EA00-0AA0	1	1 unit	200

For accessories, see page 10/34 onwards.

Overview



LOGO!Soft Comfort

- The user-friendly software for switching program generation on the PC for single mode and network mode
- Switching program generation for function diagrams (FBD) or contact diagrams (LAD)
- Additional testing, simulation, online testing and archiving of the switching programs
- Professional documentation with the help of various comment and print functions

The connection between LOGO! and the PC is made with the LOGO! PC cable (serial interface) or the LOGO! USB PC cable (USB interface).

With LOGO! 0BA7 and LOGO! 8, the connection is made via the integrated Ethernet interface.

Minimum system requirements

Windows XP (32-bit), 7 (32/64-bit) or 8 (32/64-bit)

- PC Pentium IV
- 150 MB free on hard disk
- 256 MB RAM
- SVGA graphics card with minimum resolution of 800 x 600 (256 colors)
- DVD ROM

Mac OS X

- Mac OS X 10.4

Linux

- Tested with SUSE Linux 11.3 SP2, Kernel 3.0.76
- Runs on all Linux distributions on which Java 2 runs.
- For hardware requirements, [please consult your Linux distribution](#).

Application

LOGO!Soft Comfort is the multilingual software for switching program generation with LOGO! on the PC. LOGO!Soft Comfort can be used to program all devices of the LOGO! family.

Selection and ordering data

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
LOGO!Soft Comfort						
LOGO!Soft Comfort V8	1	6ED1058-0BA08-0YA1		1	1 unit	200
For programming on the PC in LAD/FBD; runs on Windows 8, 7, XP, Linux and Mac OSX; on DVD						

Relays

Timing Relays

General data

Overview



7PV15, SIRIUS 3RP25 and SIRIUS 3RP20 timing relays

More information

Homepage, see www.siemens.com/relays

Industry Mall, see www.siemens.com/product?3RP

Electronic timing relays are used in control, starting, and protective circuits for all switching operations involving time delays.

Their fully developed concept and space-saving, compact design make the SIRIUS 3RP timing relays ideal timer modules for control cabinet, switchgear and control manufacturers in the industry.

With their narrow design, the 7PV15 timing relays are ideal in particular for use in heating, ventilation and air-conditioning systems and in compressors. All 7PV15 timing relays in this enclosure version are suitable for snap-on mounting onto TH 35 standard mounting rails according to IEC 60175. The enclosure complies with DIN 43880.

The SIRIUS 3RA28 function modules enable the assembly of starters and contactor assemblies for direct-on-line and wye-delta starting. They include the key control functions required for the particular feeder, e.g. timing and electrical interlocking. The function modules that function as timing relays are mounted quickly and simply on SIRIUS contactors – without any great wiring effort.

The SIRIUS 3RA28 solid-state time-delay auxiliary switches which can be mounted onto contactors are designed for contactor coil voltages in the range from 24 to 240 V AC/DC (wide voltage range). Auxiliary switches for control and alarm signals are used specially for switching the smallest signals for electronics applications. They are used, for example, for allowing a pump or fan to run on, or for the delayed activation of a gate drive.

Simply by being plugged in place, the SIRIUS 3RT19 timing relays enable different functionalities required for the assembly of starters to be realized in the feeder. At the same time the timing relays for mounting onto contactors reduce the wiring work required within the feeder and save space in the control cabinet.

Device series

SIRIUS timing relays for standard rail mounting

- SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm, see page 10/39
- SIRIUS 3RP20 timing relays, 45 mm, see page 10/51
- 7PV15 timing relays, 17.5 mm, see page 10/57

SIRIUS timing relays for mounting onto contactors

- SIRIUS 3RA28 solid-state time-delay auxiliary switch blocks for mounting onto 3RT2 contactors and 3RH2 contactor relays, see page 3/101
- SIRIUS 3RA28 function modules for mounting onto 3RT2 contactors and 3RH2 contactor relays, see page 3/106
- SIRIUS 3RT19 timing relays for mounting onto 3RT1 contactors, see page 3/102

Benefits

- The right design for every application
- Clear-cut basic range with five basic units in the case of the 7PV15 timing relays, and up to seven basic units in the case of the 3RP timing relays
- Considerable logistical advantages thanks to versions with wide voltage and wide time setting range
- No tools required for assembly or disassembly on standard mounting rails
- Cadmium-free relay contacts
- Recyclable, halogen-free enclosure
- Optimum price/performance ratio
- Versions with logical separation
- Low variance: One design for distribution boards and for control cabinets
- Compliance with EMC requirements for buildings
- Environmentally friendly laser inscription instead of printing containing solvents
- Versions as snap-on modules for reducing wiring and saving space in the control cabinet
- Versions with screw terminals or alternatively with spring-type terminals

Application

Timing relays with ON-delay

- Interference pulse suppression (gating of interference pulses)
- Gradual startup of motors so as not to overload the power supply

Timing relays with OFF-delay

- Generation of overtravel functions following removal of voltage
- Gradual, delayed shutdown, e.g. of motors or fans, to allow a plant to be shut down selectively

Clock-pulse relay

- Flashing, asymmetrical

Wye-delta timing relays

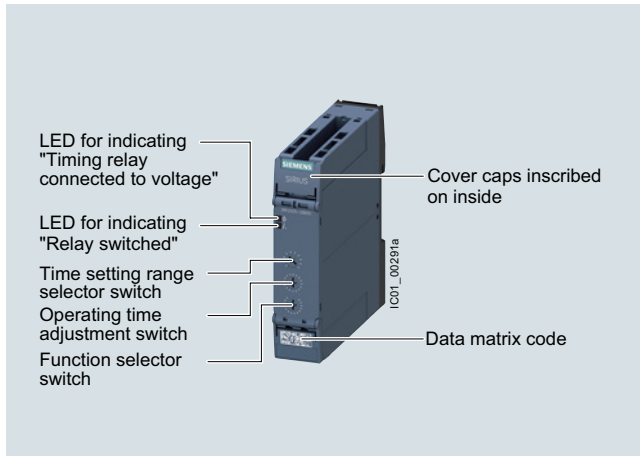
- Switching over motors from Wye to delta with a dead interval of 50 ms to prevent phase-to-phase short circuits

Multifunctional timing relays

- Maximum flexibility, with a device for every application
- Available with relay and semiconductor output
- Versions for railway applications for more exacting requirements (e.g. temperature range, vibration/shock resistance and EMC)

Watchdog function

- Monitoring of cyclic events

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm
Overview


SIRIUS 3RP25 timing relays

More information

 Homepage, see www.siemens.com/relays

 Industry Mall, see www.siemens.com/product?3RP25

 For the conversion tool, e.g. from 3RP15 to 3RP25, see www.siemens.com/sirius/conversion-tool

Electronic timing relays for general use in control systems and mechanical engineering with:

- 1 or 2 CO, 1 NO (semiconductor) or 3 NO
- Monofunction or multifunction
- Combination voltage or wide voltage range
- Single or selectable time setting ranges
- Switch position indication and voltage indication by LED

Article No. scheme

Product versions		Article number					
Timing relays		3RP25					0
Product function/ time setting ranges	Multifunction	0	5				7 time ranges 0.05 s ... 100 h
	ON-delay	1	1				1 time range 0.5 ... 10 s
		1	2				1 time range 1 ... 3 s
		1	3				1 time range 5 ... 100 s
		2	5				7 time ranges 0.05 s ... 100 h
		2	7				4 time ranges 0.05 s ... 240 s
	OFF-delay with control signal	3	5				7 time ranges 0.05 s ... 100 h
	OFF-delay without control signal, non-volatile, passing make contact	4	0				7 time ranges 0.05 s ... 600 s
	Clock-pulse relay, flashing, asymmetrical	5	5				7 time ranges 0.05 s ... 100 h
	Wye-delta function with coasting function (idling)	6	0				Wye-delta 1 ... 20 s, coasting time (idling) 600 s
	Wye-delta function	7	4				1 time range 1 ... 20 s
		7	6				1 time range 3 ... 60 s
Connection type	Screw terminals			1			
	Spring-type terminals (push-in)			2			
Contacts	1 CO				A		
	2 CO				B		
	Semiconductors (transistor NPN)				C		
	Semiconductors (thyristor), two-wire				E		
	1 NO + 1 NO (SD)				N		
	2 CO positively driven				R		
	3 NO				S		
Control supply voltage	24 V AC/DC				B	3	
	200 ... 240 V/380 ... 440 V AC				M	2	
	400 ... 440 V AC				T	2	
	12 ... 240 V AC/DC or				W	3	
	24 ... 240 V AC/DC (3RP2505-.RW30)						
Example		3RP25	0	5	-	1	A B 3 0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Relays

Timing Relays

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

3RP2505 multifunctional timing relays

Two setting options for implementing the multifunctions (A-M):



- ① Determination of 13 functions by the setting A to M, with 1 CO, 1 NO, 2 CO that switch in parallel.
- ② Extended function variance by selecting the time range and determining, whether 2 CO switch in parallel or whether 1 CO switches with delay + 1 CO switches immediately (1 CO + 1 CO)

Setting the functions on the device

The functions of the 3RP2505 multifunctional timing relays can be set by means of the function selector switch. Whether both CO contacts are switched in parallel or one CO contact with a delay and one instantaneously and the choice of time setting range are set by means of the time setting range selector switch. The exact operating time can be adjusted with the operating time switch.

Overview of functions

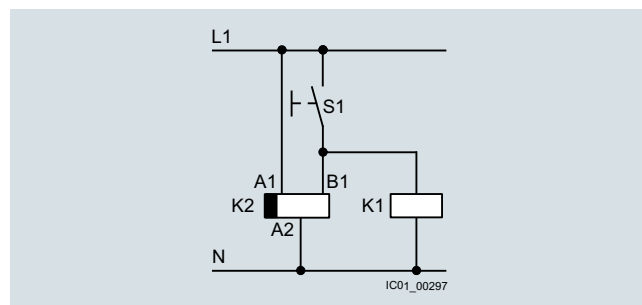
Identifica- tion letter	13 functions	27 functions
	1 CO contact (1 CO), 1 NO contact (1 NO) semiconductor, 2 CO contacts switched in parallel (2 CO) or 2 CO contacts positively driven and switched in parallel with delay (2 CO)	13 functions (A - M) 2 CO contacts switched in parallel (2 CO) + 13 functions (A - M) 1 delayed CO contact + 1 instantaneous CO contact (1 CO + 1 CO) and wye-delta function
A	ON-delay	ON-delay and instantaneous contact
B	OFF-delay with control signal	OFF-delay with control signal and instantaneous contact
C	ON-delay/OFF-delay with control signal	ON-delay/OFF-delay with control signal and instantaneous contact
D	Flashing, symmetrical, starting with interval	Flashing, symmetrical, starting with interval and instantaneous contact
E	Passing make contact, interval relay	Passing make contact, interval relay and instantaneous contact
F	Retriggerable interval relay with deactivated control signal (passing break contact with control signal)	Retriggerable interval relay with deactivated control signal (passing break contact with control signal) and instantaneous contact
G	Passing make contact, with control signal, not retriggerable (pulse-forming with control signal)	Passing make contact, with control signal, not retriggerable, (pulse-forming with control signal) and instantaneous contact
H	Additive ON-delay, instantaneous OFF with control signal	Additive ON-delay, instantaneous OFF with control signal and instantaneous contact
I	Additive ON-delay with control signal	Additive ON-delay with control signal and instantaneous contact
J	Flashing, symmetrical, starting with pulse	Flashing, symmetrical, starting with pulse and instantaneous contact
K	Pulse-delayed (fixed pulse (at 1 s) and settable pulse delay)	Pulse-delayed (fixed pulse (at 1 s) and settable pulse delay) and instantaneous contact
L	Pulse-delayed with control signal (fixed pulse (at 1 s) and settable pulse delay)	Pulse-delayed with control signal (fixed pulse (at 1 s) and settable pulse delay) and instantaneous contact
M	Retriggerable interval relay with activated control signal (watchdog)	Retriggerable interval relay with activated control signal and instantaneous contact (watchdog)
--	--	Wye-delta function

With a set of foil labels the timing relay can be legibly marked with the functions which can be selected on the timing relay. This is supplied together with the multifunctional timing relay.

The same potential must be applied to terminals A. and B.

Note:

The activation of loads parallel to the start input is permissible when using AC/DC control voltage.



Diagram

Benefits

- Easy stock keeping and logistics thanks to low variance of devices
- Reduced space requirement in the control cabinet thanks to variants in width 17.5 mm and 22 mm
- Consistent for all functions thanks to wide voltage range from 12 to 240 V AC/DC
- Up to 27 functions according to IEC 61812 in the multifunctional timing relay with wide voltage range
- Multifunctional timing relay with semiconductor output for high switching frequencies, bounce-free and wear-free switching

Standards and approvals

- IEC 60721-3-3 "Classification of environmental conditions"
- IEC 61812-1/DIN VDE 0435 Part 2021 "Specified time relays for industrial use"
- IEC 61000-6-2, IEC 61000-6-3 and IEC 61000-6-4 "Electromagnetic compatibility"
- IEC 60947-5-1 "Low-voltage switchgear and controlgear – Electromechanical control circuit devices"

Application

Timing relays are used in control, starting, and protective circuits for all switching operations involving time delays. They guarantee a high level of functionality and a high repeat accuracy of timer settings.

Enclosure version

All timing relays are suitable for snap-on mounting onto TH 35 standard mounting rails according to IEC 60715 or for screw fixing.

Relays

Timing Relays

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

Technical specifications

More information

Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16354/td>

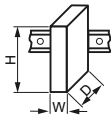
Manual, see <https://support.industry.siemens.com/cs/ww/en/view/103532830>

Internal circuit diagrams, see [CAx Download Manager](#)

<https://support.industry.siemens.com/my/ww/en/CAxOnline#CAxOnline>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16354/faq>

Article number	3RP2505-.A, 3RP2505-.C, 3RP251., 3RP2525-.A, 3RP2527, 3RP253., 3RP255.	3RP2505-.B, 3RP2505-.R, 3RP2525-.B, 3RP254., 3RP256., 3RP257.
Width x height x depth	mm 17.5 x 100 x 90	22.5 x 100 x 90



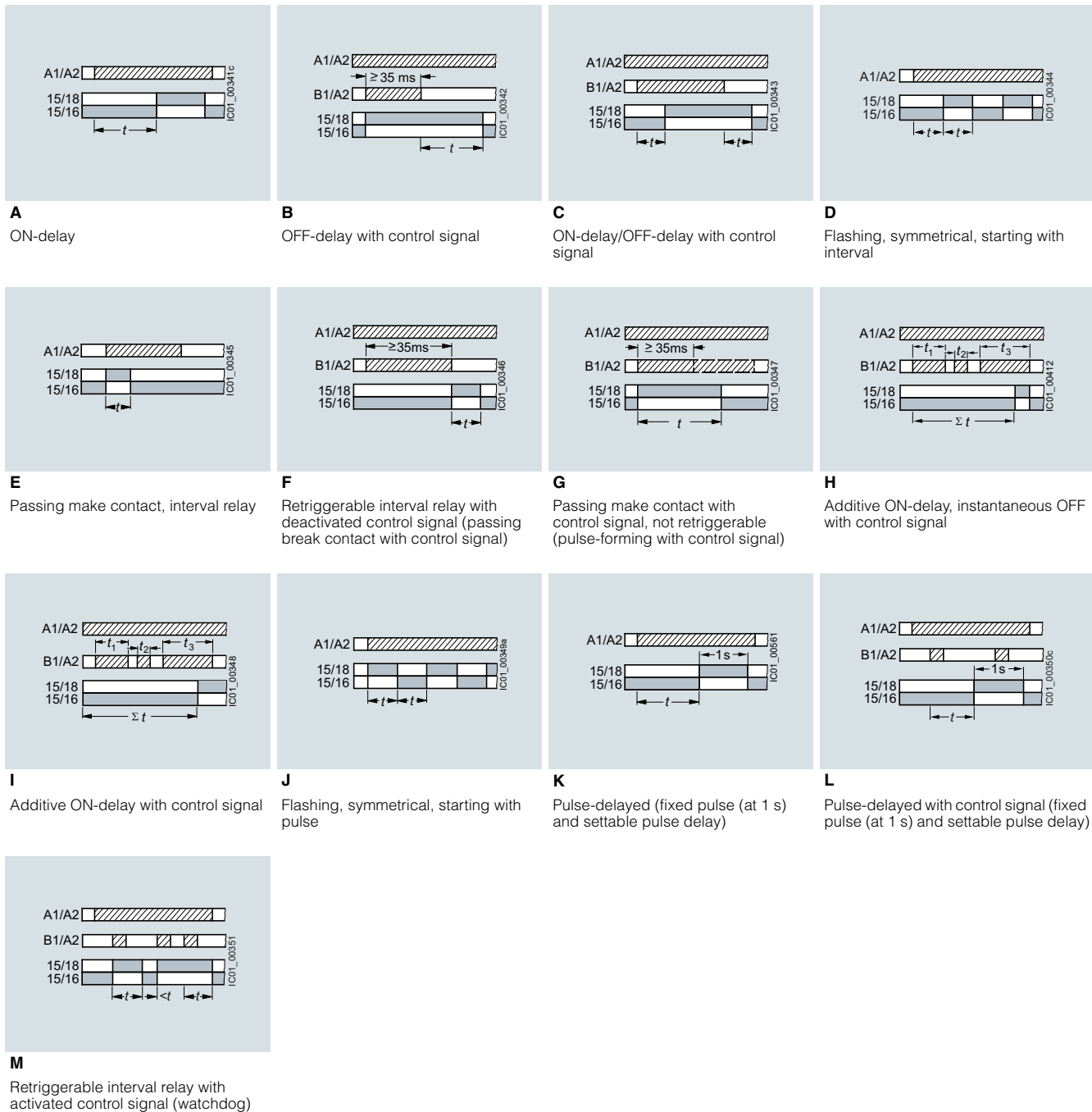
Article number	3RP25...-AB30, 3RP25...-AW30, 3RP25...-BB30, 3RP25...-BW30, 3RP25...-NW30, 3RP25...-SW30	3RP25...-BT20, 3RP25...-NM20	3RP25...-CW30	3RP25...-EW30	3RP25...-RW30
----------------	---	---	----------------------	----------------------	----------------------

General technical specifications:						
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3, rated value	V AC	300	500	300	--	300
Ambient temperature						
• During operation	°C	-25 ... +60				-40 ... +70
• During storage	°C	-40 ... +85				-40 ... +85
Operating range factor of the control supply voltage, rated value						
• At AC						
- At 50 Hz		0.85 ... 1.1	0.85 ... 1.1	0.85 ... 1.1	0.85 ... 1.1	0.7 ... 1.1
- At 60 Hz		0.85 ... 1.1	0.85 ... 1.1	0.85 ... 1.1	0.85 ... 1.1	0.7 ... 1.1
• At DC		0.85 ... 1.1	--	0.85 ... 1.1	0.85 ... 1.1	0.7 ... 1.1
Switching capacity current with inductive load	A	0.01 ... 3	0.01 ... 3	0.01 ... 1	0.01 ... 0.6	0.01 ... 3
Operational current of the auxiliary contacts						
• At AC-15						
- At 24 V	A	3	3	1	--	3
- At 250 V	A	3	3	1	--	3
- At 400 V	A	--	3	--	--	--
• At DC-12						
- At 24 V	A	--	--	1	--	--
- At 125 V	A	--	--	1	--	--
- At 250 V	A	--	--	1	--	--
• At DC-13						
- At 24 V	A	1	1	--	--	1
- At 125 V	A	0.2	0.2	--	--	0.2
- At 250 V	A	0.1	0.1	--	--	0.1
Thermal current	A	5	5	1	0.6	5
Mechanical endurance (operating cycles)		10 000 000				
Electrical endurance (operating cycles) for AC-15 at 230 V		100 000		300 000	100 000	

Article number	3RP25...-1...0	3RP25...-2...0
Type of electrical connection for auxiliary and control circuits	Screw terminals	Spring-type terminals (push-in)
Design of thread of connection screw	M3	--
Tightening torque	Nm 0.6 ... 0.8	--
Type of connectable conductor cross-sections		
• Solid	1x (0.5 ... 4 mm²), 2 x (0.5 ... 2.5 mm²)	1x (0.5 ... 4 mm²)
• Finely stranded with end sleeve	1x (0.5 ... 4 mm²), 2 x (0.5 ... 1.5 mm²)	1x (0.5 ... 2.5 mm²)
• For AWG cables		
- Solid	1x (20 ... 12), 2 x (20 ... 14)	1x (20 ... 12)
- Stranded	1x (20 ... 12), 2 x (20 ... 14)	1x (20 ... 12)

3RP25 function diagrams

Multifunction 3RP2505-.A, 1 CO, 13 functions and 3RP2505-.C, 1 NO (semiconductor), 13 functions



Legend

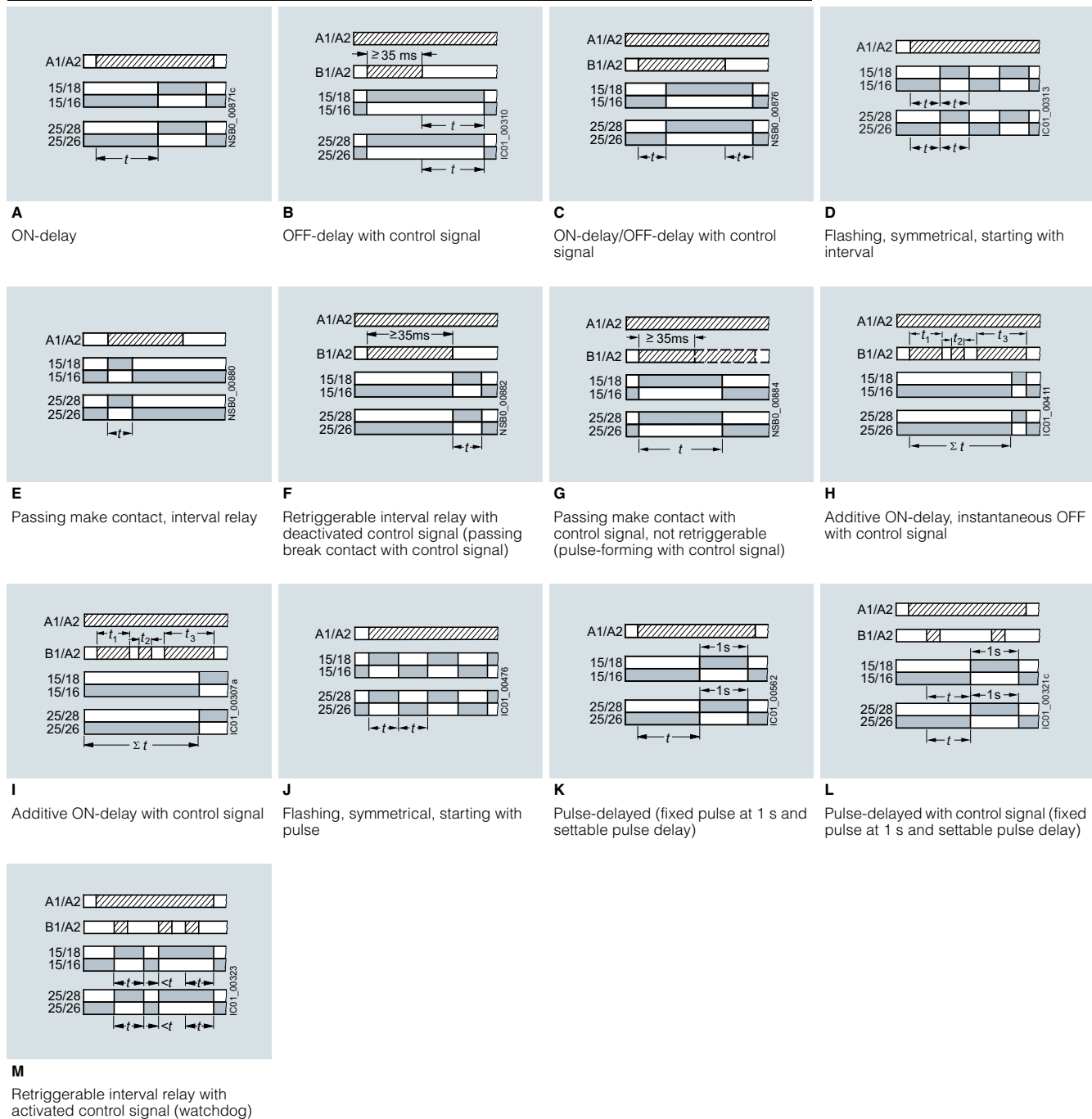
- A ... M** Identification letters
- ▨ Timing relay energized
- Contact closed
- Contact open

Relays

Timing Relays

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

Multifunction 3RP2505-.R, 13 functions, 2 CO positively driven and switched in parallel with delay

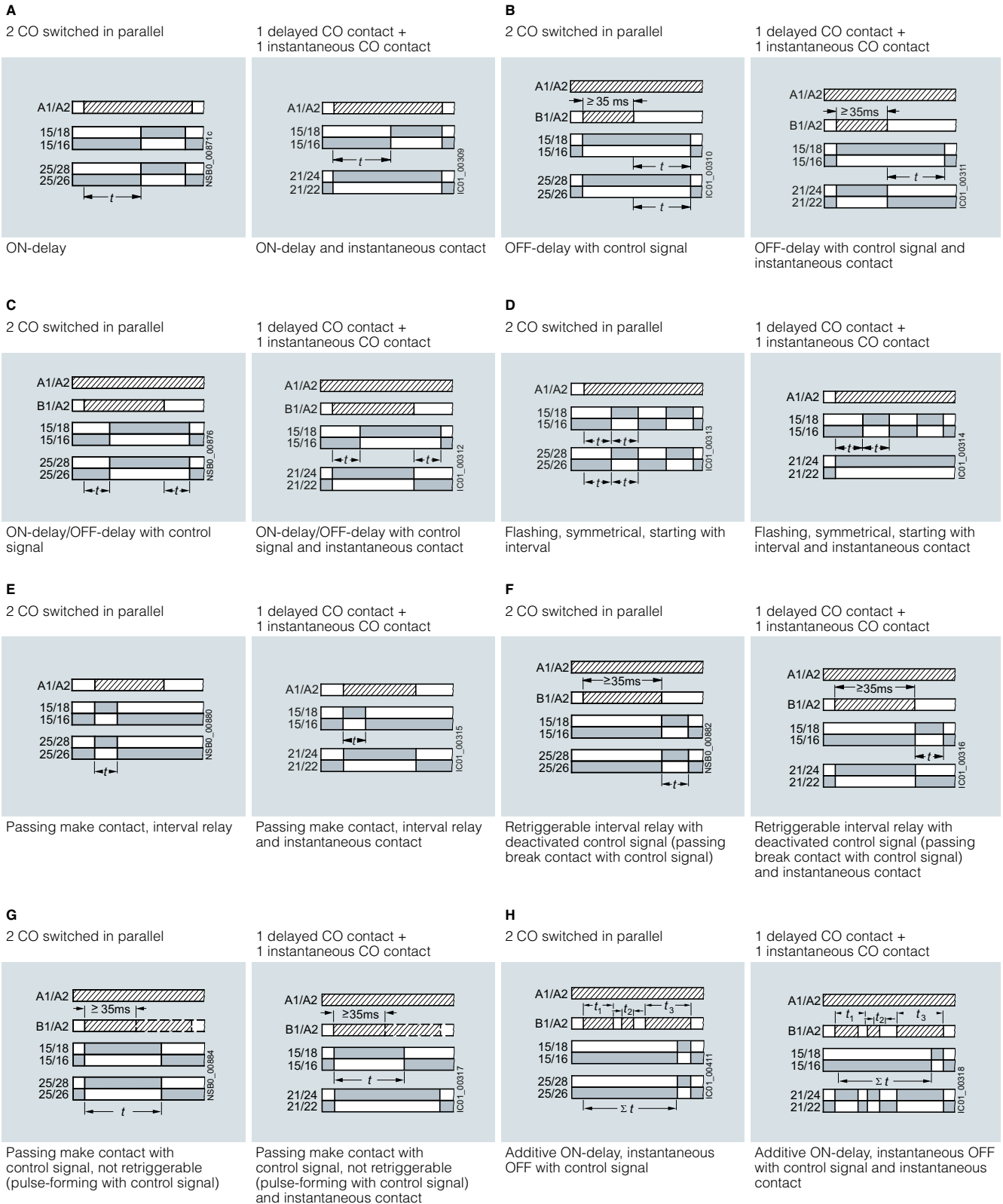


Legend

- A ... M** Identification letters
 [Shaded box] Timing relay energized
 [Solid line] Contact closed
 [Dashed line] Contact open

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

Multifunction 3RP2505-.B, 27 functions, 2 CO



Legend

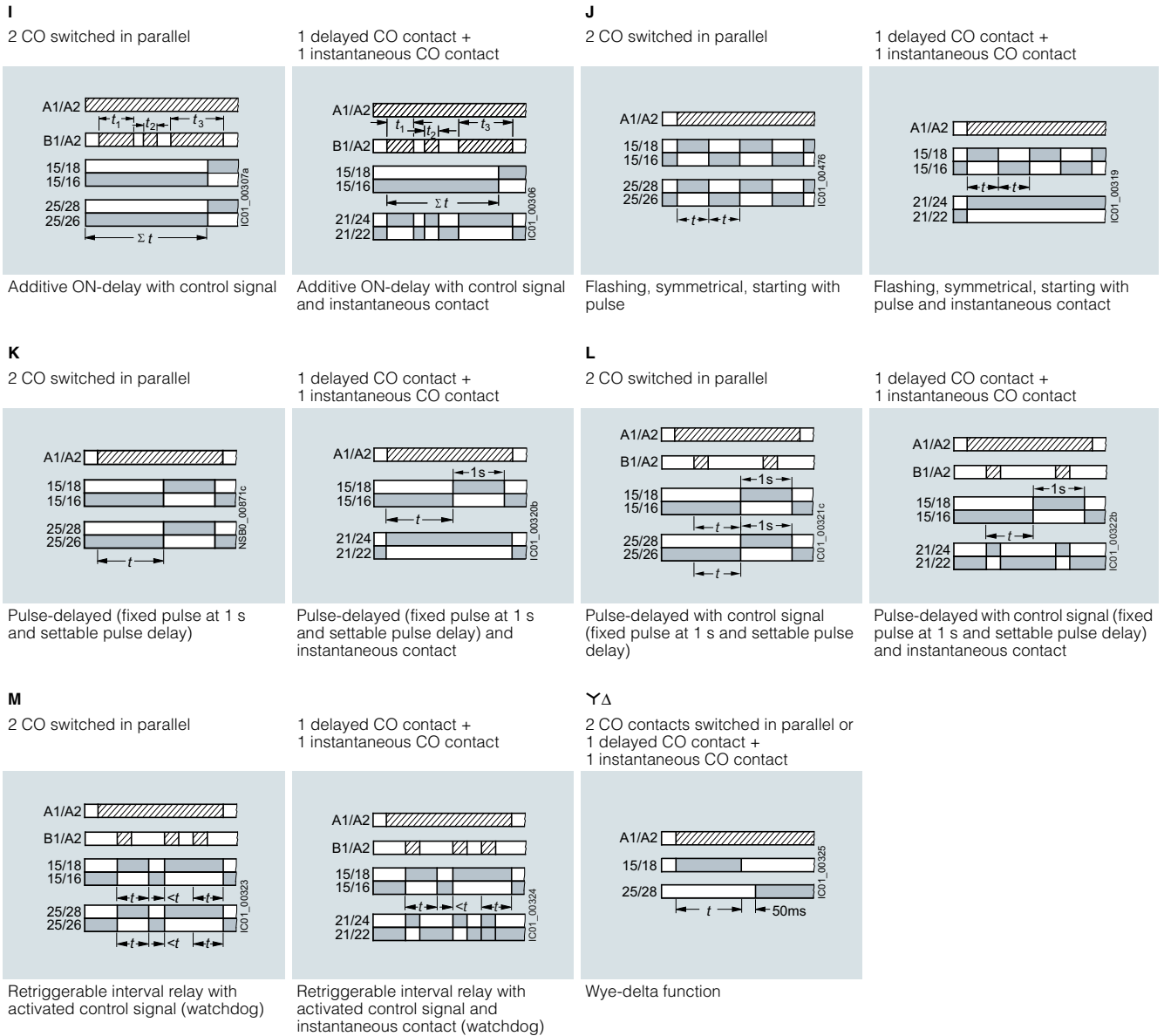
- A ... H** Identification letters
 Timing relay energized
 Contact closed
 Contact open

Relays

Timing Relays

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

Multifunction 3RP2505-.B, 27 functions, 2 CO (continued)

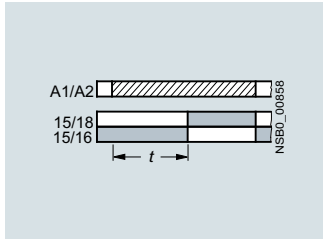


Legend

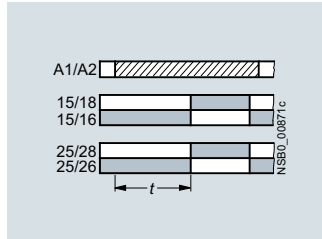
- I ... M** Identification letters
 Timing relay energized
 Contact closed
 Contact open

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

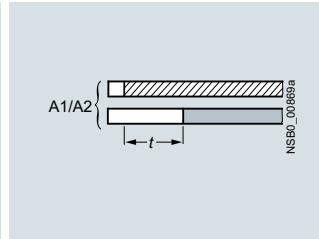
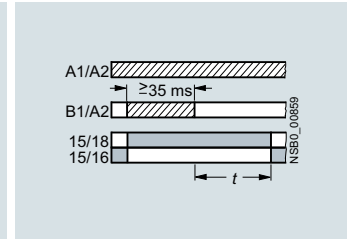
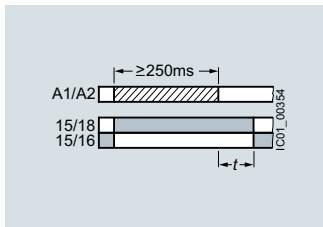
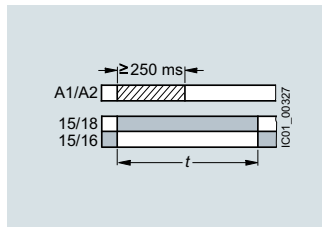
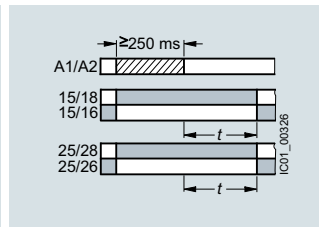
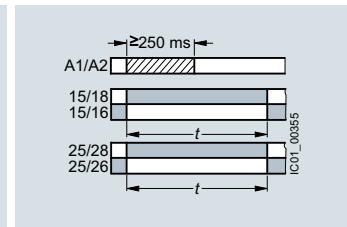
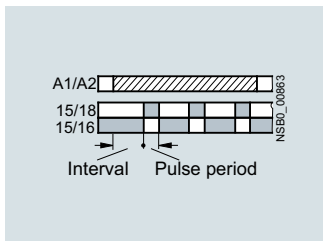
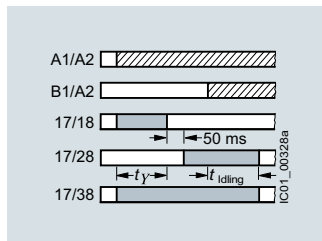
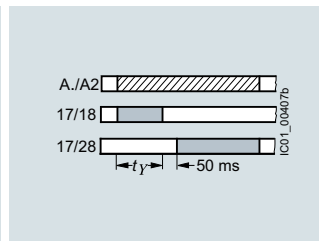
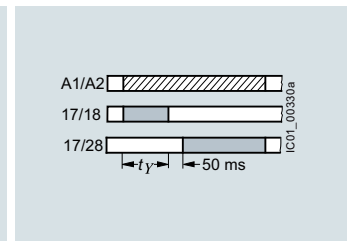
Monofunctions 3RP251. to 3RP257.¹⁾



3RP251-AW30, 1 CO, ON-delay



3RP2525-W30, 2 CO, ON-delay

3RP2527-EW30, 1 NO
(semiconductor), ON-delay3RP2535-AW30, 1 CO, OFF-delay with
control signal3RP2540-A.30, 1 CO, OFF-delay
(N)¹⁾3RP2540-A.30, 1 CO, positive
passing make contact (O)¹⁾3RP2540-B.30, 2 CO, OFF-delay
(N)¹⁾3RP2540-B.30, 2 CO, positive passing
make contact (O)¹⁾3RP2555-AW30, 1 CO, flashing,
asymmetrical, starting with interval
(clock-pulse relay)3RP2560-SW30, 3 NO, wye-delta
function with overtravel function
(idling)3RP257-NM20, 2 NO, wye-delta
function3RP257-NM30, 2 NO, wye-delta
function

Legend

- Timing relay energized
- Contact closed
- Contact open

¹⁾ 3RP2540 has a double function:
Function N = OFF-delay
Function O = Positive passing make contact

Relays

Timing Relays

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

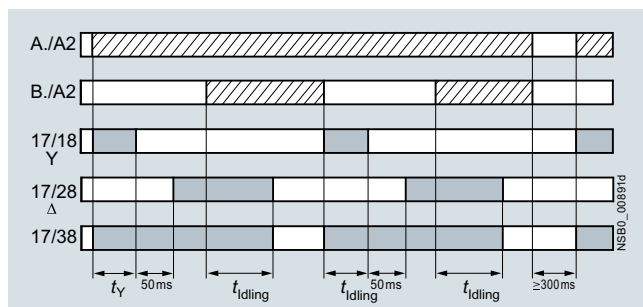
Possibilities of operation of the 3RP2560-.SW30 timing relay

Operation 1: Start contact B./A2 is open when control supply voltage A./A2 is applied

The control supply voltage is applied to A./A2 and there is no control signal on B./A2. This starts the $\Upsilon\Delta$ timing. The idling time (coasting time) is started by applying a control signal to B./A2. When the set time t_{idling} (30 ... 600 s) has elapsed, the output relays (17/38 and 17/28) are reset. If the control signal on B./A2 is switched off (minimum OFF period 270 ms), a new timing is started.

Note:

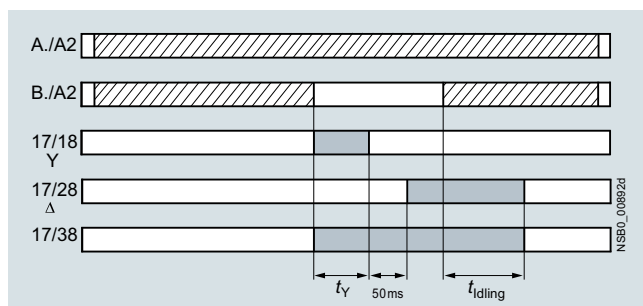
Observe response time (dead time) of 400 ms on energizing control supply voltage until contacts 17/18 and 17/38 close.



Operation 1

Operation 2: Start contact B./A2 is closed when control supply voltage A./A2 is applied

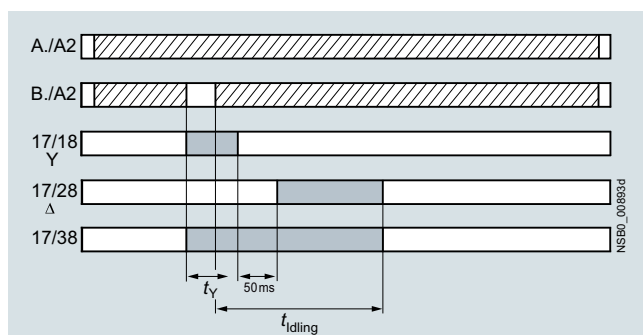
If the control signal B./A2 is already present when the control supply voltage A./A2 is applied, **no** timing is started. The timing is only started when the control signal B./A2 is switched off.



Operation 2

Operation 3: Start contact B./A2 closes while star time is running

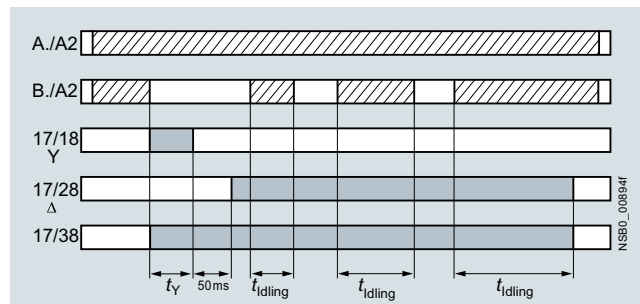
If the control signal B./A2 is applied again during the star time, the idling time starts and the timing is terminated normally.



Operation 3

Operation 4: Start contact B./A2 opens while delta time is running and is applied again

If the control signal on B./A2 is applied and switched off again during the delta time, although the idling time has not yet elapsed, the idling time (coasting time) is reset to zero. If the control signal is re-applied to B./A2, the idling time is restarted.



Operation 4

Legend

- Timing relay energized
- Contact closed
- Contact open

t_Y = Star time 1 ... 20 s

t_{idling} = Idling time (coasting time) 30 ... 600 s

Note:

The following applies to all operations: The pressure switch controls the timing via B./A2.

Application example based on standard operation (operation 1):
For example, use of 3RP2560 for compressor control

Frequent starting of compressors strains the network, the machine, and the increased costs for the operator. The new timing relay prevents frequent starting at times when there is high demand for compressed air. A special control circuit prevents the compressor from being switched off immediately when the required air pressure in the tank has been reached. Instead, the valve in the intake tube is closed and the compressor runs in "Idling" mode, i.e. in no-load operation for a specific time which can be set from 30 ... 600 s.

If the pressure falls within this time, the motor does not have to be restarted again, but can return to nominal load operation from no-load operation.

If the pressure does not fall within this idling time, the motor is switched off.

The pressure switch controls the timing via B./A2.

The control supply voltage is applied to A./A2 and the start contact B./A2 is open, i.e. there is no control signal on B./A2 when the control supply voltage is applied. The pressure switch signals "too little pressure in system" and starts the timing by way of terminal B./A2. The compressor is started, enters $\Upsilon\Delta$ operation, and fills the pressure tank.

When the pressure switch signals "sufficient pressure", the control signal B./A2 is applied, the idling time (coasting time) is started, and the compressor enters no-load operation for the set period of time from 30 ... 600 s. The compressor is then switched off. The compressor is only restarted if the pressure switch responds again (low pressure).

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

Selection and ordering data



3RP2505-2AB30



3RP2505-2BB30



3RP2525-2AW30



3RP2540-2AW30



3RP2555-2AW30



3RP2576-2NW30

Number of NO contacts		Number of CO contacts		Semi-conductor output	Adjustable time	Control supply voltage		SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Instantaneous switching	Delayed switching	Instantaneous switching	Delayed switching			At 50/60 Hz AC	At DC						
						V	V	d					
13 functions													
0	0	0	1	No	0.05 s ... 100 h	24	24	▶	3RP2505-□AB30		1	1 unit	41H
						12 ... 240	12 ... 240	▶	3RP2505-□AW30		1	1 unit	41H
0	1	0	0	Yes	0.05 s ... 100 h	12 ... 240	12 ... 240	2	3RP2505-□CW30		1	1 unit	41H
13 functions, suitable for railway applications													
0	0	0	2 ¹⁾	No	0.05 s ... 100 h	24 ... 240	24 ... 240	▶	3RP2505-□RW30		1	1 unit	41H
27 functions													
0	0	0	2 ²⁾	No	0.05 s ... 100 h	24	24	▶	3RP2505-□BB30		1	1 unit	41H
						400 ... 440	--	▶	3RP2505-□BT20		1	1 unit	41H
						12 ... 240	12 ... 240	▶	3RP2505-□BW30		1	1 unit	41H
ON-delay													
0	0	0	1	No	0.5 ... 10 s	12 ... 240	12 ... 240	▶	3RP2511-□AW30		1	1 unit	41H
					1 ... 30 s	12 ... 240	12 ... 240	▶	3RP2512-□AW30		1	1 unit	41H
					5 ... 100 s	12 ... 240	12 ... 240	▶	3RP2513-□AW30		1	1 unit	41H
					0.05 s ... 100 h	12 ... 240	12 ... 240	▶	3RP2525-□AW30		1	1 unit	41H
0	0	0	2	No	0.05 s ... 100 h	24	24	2	3RP2525-□BB30		1	1 unit	41H
						12 ... 240	12 ... 240	2	3RP2525-□BW30		1	1 unit	41H
0	1	0	0	Yes	0.05 s ... 240 s	12 ... 240	12 ... 240	2	3RP2527-□EW30		1	1 unit	41H
OFF-delay with control signal													
0	0	0	1	No	0.05 s ... 100 h	12 ... 240	12 ... 240	▶	3RP2535-□AW30		1	1 unit	41H
OFF-delay without control signal, non-volatile, passing make contact													
0	0	0	1	No	0.05 s ... 600 s	24	24	2	3RP2540-□AB30		1	1 unit	41H
						12 ... 240	12 ... 240	▶	3RP2540-□AW30		1	1 unit	41H
0	0	0	2	No	0.05 s ... 600 s	24	24	2	3RP2540-□BB30		1	1 unit	41H
						12 ... 240	12 ... 240	▶	3RP2540-□BW30		1	1 unit	41H
Clock-pulse relay, flashing, asymmetrical													
0	0	0	1	No	0.05 s ... 100 h	12 ... 240	12 ... 240	▶	3RP2555-□AW30		1	1 unit	41H
Wye-delta function with coasting function (idling)													
1	2	0	0	No	1 ... 20 s	12 ... 240	12 ... 240	2	3RP2560-□SW30		1	1 unit	41H
Wye-delta function													
1	1	0	0	No	1 ... 20 s	380 ... 440 ³⁾	--	2	3RP2574-□NM20		1	1 unit	41H
						12 ... 240	12 ... 240	▶	3RP2574-□NW30		1	1 unit	41H
1	1	0	0	No	3 ... 60 s	380 ... 440 ³⁾	--	2	3RP2576-□NM20		1	1 unit	41H
						12 ... 240	12 ... 240	▶	3RP2576-□NW30		1	1 unit	41H

Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

¹⁾ Positively-driven contacts.

²⁾ Optionally 1 CO delayed + 1 CO instantaneous.

³⁾ With 3RP2574-NM20 and 3RP2576-NM20, connection of 200 ... 240 V AC, 50/60 Hz control voltage is also possible.

Notes:

For accessories, see page 10/50.

In the case of 3RP2505, the functions can be adjusted by means of function selector switches on the device. With a set of foil labels the timing relay can be legibly marked with the functions which can be selected on the timing relay. This is included in the scope of supply. The same potential must be applied to terminals A. and B.

For functions, see the overview of functions on page 10/40.

Relays











Timing Relays

SIRIUS 3RP25 timing relays, 17.5 mm and 22.5 mm

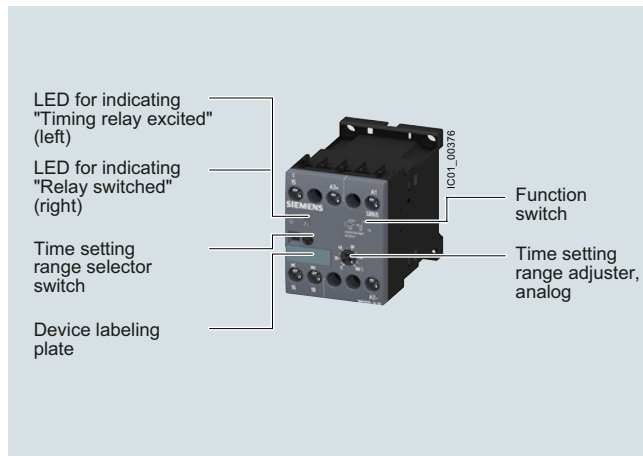
Accessories

More information

You can find information on configuring and dimensioning the accessories in the manual, see <https://support.industry.siemens.com/cs/ww/en/view/103532830>

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
d						
Accessories for enclosures						
 3ZY1321-2AA00	Sealing covers					
	<ul style="list-style-type: none"> • 17.5 mm • 22.5 mm 	2	3ZY1321-1AA00	1	5 units	41L
		2	3ZY1321-2AA00	1	5 units	41L
 3ZY1311-0AA00	Push-in lugs For wall mounting	2	3ZY1311-0AA00	1	10 units	41L
 3ZY1440-1AA00	Coding pins For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure; they enable the mechanical coding of terminals	2	3ZY1440-1AA00	1	12 units	41L
 3ZY1450-1AB00	Hinged cover NEW Replacement cover, without terminal labeling, titanium gray					
	<ul style="list-style-type: none"> • 17.5 mm wide • 22.5 mm wide 	2	3ZY1450-1AA00	1	5 units	41H
		2	3ZY1450-1AB00	1	5 units	41H
Terminals for SIRIUS devices in the industrial standard mounting rail enclosure						
 3ZY1122-1BA00	Removable terminals		Screw terminals 			
	<ul style="list-style-type: none"> • 2-pole, 1 x 4 mm² 	2	3ZY1122-1BA00	1	6 units	41L
 3ZY1122-2BA00	<ul style="list-style-type: none"> • 2-pole, 1 x 4 mm² 	2	Spring-type terminals (push-in)  3ZY1122-2BA00	1	6 units	41L
Tools for opening spring-type terminals						
 3RA2908-1A	Screwdrivers For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated		Spring-type terminals (push-in)  3RA2908-1A	1	1 unit	41B

Overview



SIRIUS 3RP20 timing relays

SIRIUS 3RP20 electronic timing relays for use in control systems and mechanical engineering with:

- 1 or 2 CO contacts
- Multifunction or monofunction
- Wide voltage range or combination voltage
- Single or selectable time setting ranges
- Switch position indication and voltage indication by LED

Standards

The timing relays comply with:

- IEC 60721-3-3 "Classification of environmental conditions"
- IEC 61812-1 "Specified time relays for industrial use"
- IEC 61000-6-2 and IEC 61000-6-4 "Electromagnetic compatibility"
- IEC 60947-5-1 "Low-voltage switchgear and controlgear – Electromechanical control circuit devices"
- IEC 60947-1, Appendix N "Protective separation"

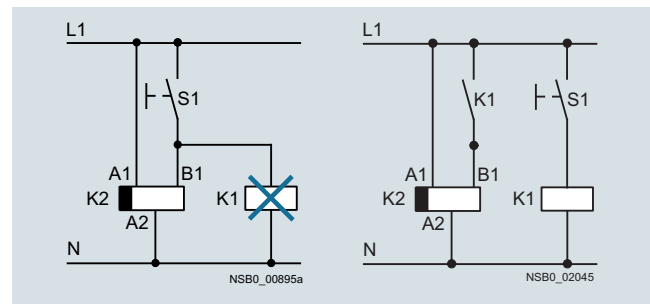
Multifunction

The functions of the 3RP2005 multifunctional timing relays can be set by means of the function selector switch. Insert labels can be used to adjust different functions of the timing relay clearly and unmistakably. The corresponding labels can be ordered as an accessory. The same potential must be applied to terminals A. and B.

For functions, see 3RP2901 label set, page 10/56.

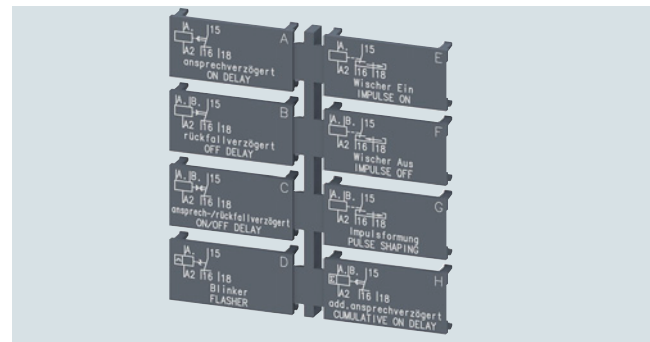
Note:

The activation of loads parallel to the start input is not permissible when using AC control voltage.



Diagrams

Accessories



Label set for marking the multifunctional relay

Article No. scheme

Product versions		Article number	
SIRIUS timing relays, 45 mm enclosure		3RP20 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 3 0	
Product function/ time setting ranges	Multifunction	0 5	15 time ranges 0.05 s... 100 h
	ON-delay	2 5	15 time ranges 0.05 s... 100 h
Connection type	Screw terminals	1	
	Spring-type terminals	2	
Contacts	1 CO	A	
	2 CO	B	
Control supply voltage	24 V AC/DC/100 ... 127 V AC	Q	Combination voltage
	24 V AC/DC/200 ... 240 V AC	P	Combination voltage
	24 ... 240 V AC/DC	W	Wide voltage range
Example		3RP20 0 5 - 1 A P 3 0	

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Relays

Timing Relays

SIRIUS 3RP20 timing relays, 45 mm

Benefits

- Suitable for 3RT miniature contactors
- Uniform design
- Ideal for small distance between standard mounting rails and/or for low mounting depth, e.g. in control boxes
- Labels are used on the multifunctional timing relay to document the function that has been set

Application

Timing relays are used in control, starting, and protective circuits for all switching operations involving time delays. They guarantee a high level of functionality and a high repeat accuracy of timer settings.

Technical specifications

More information

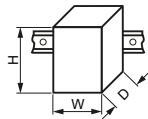
Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16356/td>
 Operating instructions, see <https://support.industry.siemens.com/cs/ww/en/view/11647144>

Internal circuit diagrams, see <https://support.industry.siemens.com/cs/ww/en/view/11647144>
 FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16356/faq>

Type

**3RP2005,
3RP2025**

Dimensions (W x H x D)



mm

45 x 57 x 73

Rated insulation voltage

V AC

300

Pollution degree 3
 Overvoltage category III

Permissible ambient temperature

- During operation
- During storage

°C
 °C

-25 ... +60
 -40 ... +85

Operating range of excitation¹⁾

0.85 ... 1.1 x U_N at AC; 0.8 ... 1.25 x U_N at DC;
 0.95 ... 1.05 times the rated frequency

Mechanical endurance

Operating
 cycles

10 x 10⁶

Electrical endurance at I_e

Operating
 cycles

1 x 10⁵

Connection type



Screw terminals

- Terminal screw
- Solid
- Finely stranded with end sleeve
- Stranded
- AWG cables
- Tightening torque

mm²
 mm²
 AWG
 AWG
 Nm

M3 (for standard screwdriver, size 2 and Pozidriv 2)
 2 x (0.5 ... 1.5)²⁾, 2 x (0.75 ... 2.5)²⁾
 2 x (0.5 ... 1.5)²⁾, 2 x (0.75 ... 2.5)²⁾
 2 x (0.5 ... 1.5)²⁾, 2 x (0.75 ... 2.5)²⁾
 2 x (18 ... 14)
 0.8 ... 1.2

Connection type



Spring-type terminals

- Solid
- Finely stranded with end sleeve
- Finely stranded without end sleeve
- AWG cables, solid or stranded
- Max. external diameter of the conductor insulation

mm²
 mm²
 mm²
 AWG
 mm

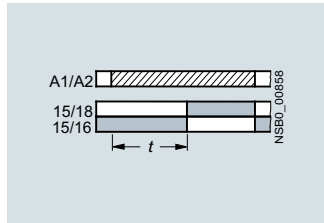
2 x (0.25 ... 2.5)
 2 x (0.25 ... 1.5)
 2 x (0.25 ... 2.5)
 2 x (24 ... 14)
 3.6

¹⁾ If nothing else is stated.

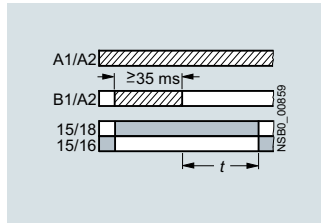
²⁾ If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in one of the ranges specified.

3RP20 function diagrams and 3RP2901 label set

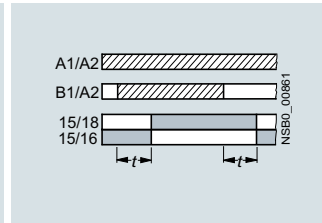
1 CO contact



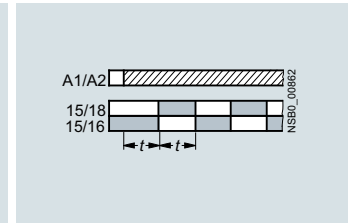
A
3RP2005-.A, 3RP2025
ON-delay



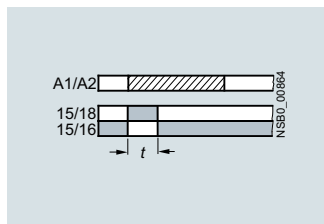
B¹)
3RP2005-.A
OFF-delay with control signal



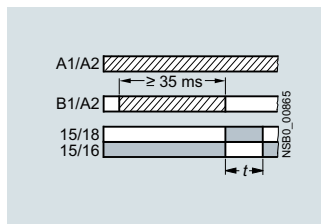
C¹)
3RP2005-.A
ON and OFF-delay
with control signal ($t = t_{on} = t_{off}$)



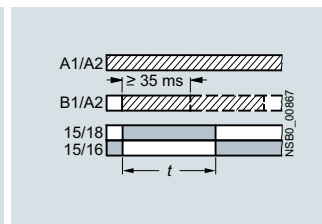
D
3RP2005-.A
Flashing, starting with interval
(pulse/interval 1:1)



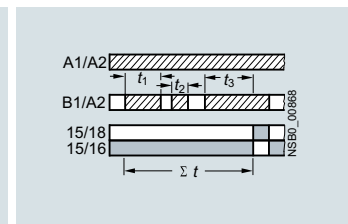
E
3RP2005-.A
Passing make contact



F¹)
3RP2005-.A
Passing break contact with control
signal



G¹)
3RP2005-.A
Pulse-forming with control signal
(pulse generation at the output does
not depend on duration of energizing)



H¹)
3RP2005-.A
Additive ON-delay with control signal

Legend

A ... H Identification letters for 3RP2005

▨ Timing relay energized

■ Contact closed

□ Contact open

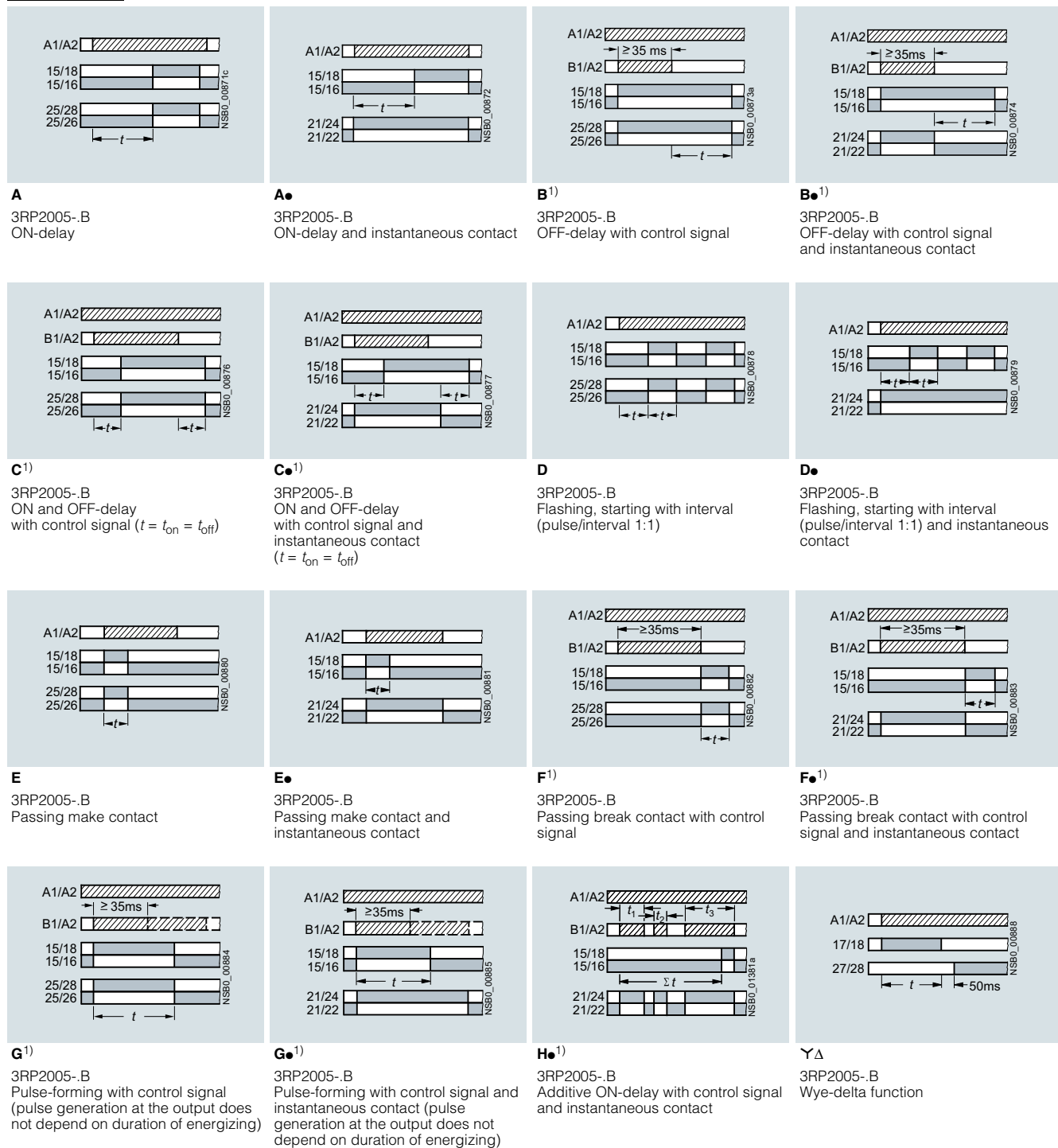
¹) Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero (retriggerable). This does not apply to G, G● and H●, which are not retriggerable.

Relays

Timing Relays

SIRIUS 3RP20 timing relays, 45 mm

2 CO contacts



Legend

A ... H Identification letters for 3RP2005

▨ Timing relay energized

■ Contact closed

□ Contact open

¹⁾ Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero (retriggerable). This does not apply to G, G● and H●, which are not retriggerable.

Selection and ordering data

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H



3RP2005-1AP30





3RP2005-1BW30



3RP2005-2AP30



3RP2025-2BW30

Version	Time setting range t	Rated control supply voltage U_s		SD	Screw terminals 		SD	Spring-type terminals 	
		50/60 Hz AC	DC		Article No.	Price per PU	d	Article No.	Price per PU
					V	V	d		
3RP2005 timing relays, multifunction, 15 time setting ranges									
The functions can be adjusted by means of rotary switches. Insert labels can be used to adjust different functions of the 3RP2505 timing relay clearly and unmistakably. The corresponding labels can be ordered as an accessory. The same potential must be applied to terminals A. and B. For functions, see 3RP2901 label set, page 10/56.									
With LED and 1 CO contact ¹⁾ , 8 functions	0.05 ... 1 s 0.15 ... 3 s 0.5 ... 10 s	24/100 ... 127 24/200 ... 240	24 24	▶ ▶	3RP2005-1AQ30 3RP2005-1AP30		2 ▶	3RP2005-2AQ30 3RP2005-2AP30	
With LED and 2 CO contacts, 16 functions	1.5 ... 30 s 0.05 ... 1 min 5 ... 100 s 0.15 ... 3 min 0.5 ... 10 min 1.5 ... 30 min 0.05 ... 1 h 5 ... 100 min 0.15 ... 3 h 0.5 ... 10 h 1.5 ... 30 h 5 ... 100 h ∞ ²⁾	24 ... 240 ³⁾	24 ... 240 ⁴⁾	▶	3RP2005-1BW30		2	3RP2005-2BW30	
3RP2025. timing relays, ON-delay, 15 time setting ranges									
With LED and 1 CO contact ¹⁾	0.05 ... 1 s 0.15 ... 3 s 0.5 ... 10 s 1.5 ... 30 s 0.05 ... 1 min 5 ... 100 s 0.15 ... 3 min 0.5 ... 10 min 1.5 ... 30 min 0.05 ... 1 h 5 ... 100 min 0.15 ... 3 h 0.5 ... 10 h 1.5 ... 30 h 5 ... 100 h ∞ ²⁾	24/100 ... 127 24/200 ... 240	24 24	▶ ▶	3RP2025-1AQ30 3RP2025-1AP30		5 ▶	3RP2025-2AQ30 3RP2025-2AP30	

For accessories, see page 10/56.

¹⁾ Units with protective separation.

²⁾ With ∞ switch position no timing. For test purposes (ON/OFF function) on site. Relay is constantly on when activated, or relay remains constantly off when activated. Depending on which function is set.

³⁾ Operating range 0.8 to 1.1 × U_s .

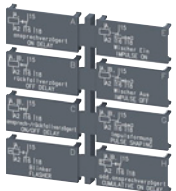
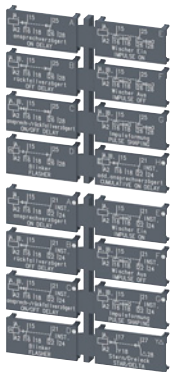
⁴⁾ Operating range 0.7 to 1.1 × U_s .

Relays

Timing Relays

SIRIUS 3RP20 timing relays, 45 mm

Accessories

Version	Function	Identifi- cation letter	Use	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Label sets for 3RP20									
Accessories for 3RP20 (not included in the scope of supply). The label set can be used to label timing relays with the set function in English and German.									
 3RP2901-0A	1 label set (1 unit) with 8 functions	<ul style="list-style-type: none"> • ON-delay • OFF-delay with control signal • ON-delay and OFF-delay with control signal • Flashing, starting with interval • Passing make contact • Passing break contact with control signal • Pulse-forming with control signal • Additive ON-delay with control signal 	<ul style="list-style-type: none"> A B C D E F G H 	For devices with 1 CO	10	3RP2901-0A	1	5 units	41H
 3RP2901-0B	1 label set (1 unit) with 16 functions	<ul style="list-style-type: none"> • ON-delay • OFF-delay with control signal • ON-delay and OFF-delay with control signal • Flashing, starting with interval • Passing make contact • Passing break contact with control signal • Pulse-forming with control signal • ON-delay and instantaneous contact • OFF-delay with control signal and instantaneous contact • ON-delay and OFF-delay with control signal and instantaneous contact • Flashing, starting with interval, and instantaneous contact • Passing make contact and instantaneous contact • Passing break contact with control signal and instantaneous contact • Pulse-forming with control signal and instantaneous contact • Additive ON-delay with control signal and instantaneous contact • Wye-delta function 	<ul style="list-style-type: none"> A B C D E F G A• B• C• D• E• F• G• H• YΔ 	For devices with 2 CO	10	3RP2901-0B	1	5 units	41H
Blank inscription labels for 3RP20									
	Blank inscription labels, 20 mm x 7 mm, pastel turquoise ¹⁾		For 3RP20	20	3RT1900-1SB20		100	340 units	41B

¹⁾ PC labeling system for individual inscription
of unit labeling plates available from:
Conta-Clip Verbindungstechnik GmbH,
[see page 16/16](#).

Overview



7PV15 timing relay

Electronic timing relays for general use and in control systems, mechanical engineering and infrastructure with:

- 1 or 2 CO contacts
- Multifunction or monofunction
- Wide voltage range or combination voltage
- Single or selectable time setting ranges
- Switch position indication and voltage indication by LED

Standards

The timing relays comply with:

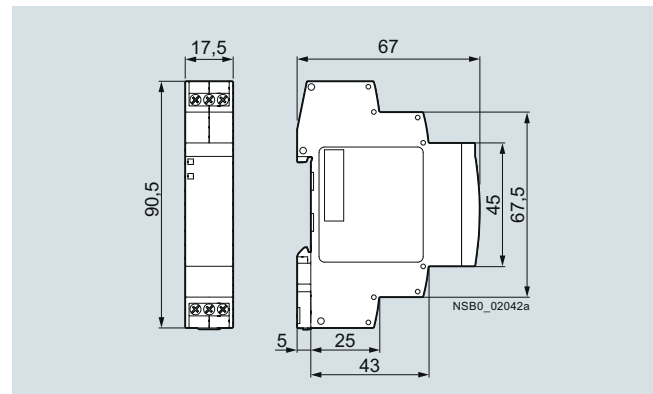
- IEC 60721-3-3 "Classification of environmental conditions"
- IEC 61812-1 "Specified time relays for industrial use"
- IEC 61000-6-2 and IEC 61000-6-4 "Electromagnetic compatibility"
- IEC 60947-5-1 "Low-voltage switchgear and controlgear – Electromechanical control circuit devices"
- DIN 43880 "Built-in equipment for electrical installations; overall dimensions and related mounting dimensions"

Multifunction

The functions of the 7PV1508-1A multifunctional timing relay can be set by means of rotary switches. The identification letters A to G are printed on the front alongside the rotary selector switch of the unit. The related function can be found in the form of a bar graph on the side of the device.

Enclosure version

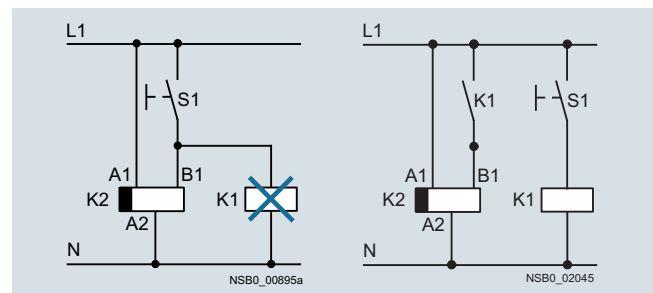
All timing relays are suitable for snap-on mounting onto TH 35 standard mounting rails according to IEC 60715. The enclosure complies with DIN 43880, 1 MW.



Dimensions

Note:

The activation of loads parallel to the start input is not permissible when using AC control voltage.



Diagrams

Relays

Timing Relays

7PV15 timing relays, 17.5 mm

Article No. scheme

Product versions		Article number	
Timing relays in industrial enclosure, 17.5 mm		7PV15	<input type="checkbox"/> <input type="checkbox"/> – 1 <input type="checkbox"/> <input type="checkbox"/> 3 0
Product function/ time setting ranges	Multifunction	0 8	7 time ranges 0.05 s ... 100 h
	ON-delay	1 1	1 time range 0.05 ... 1 s
		1 2	1 time range 0.5 ... 10 s
		1 3	1 time range 5 ... 100 s
		1 8	7 time ranges 0.05 s ... 100 h
	OFF-delay with control signal	3 8	7 time ranges 0.05 s ... 100 h
	OFF-delay without control signal	4 0	7 time ranges 0.05 s ... 100 s
	Clock-pulse relay	5 8	7 time ranges 0.05 s ... 100 h
	Wye-delta function	7 8	7 time ranges 0.05 s ... 100 h
Contacts	e.g. A = 1 CO contact		<input type="checkbox"/>
Control supply voltage	e.g. W = 12 ... 240 V AC/DC		<input type="checkbox"/> Combination voltage
Example		7PV15 0 8 – 1 A W 3 0	

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.


Benefits

- Wide voltage range 12 to 240 V AC/DC
- High switching capacity, e.g. AC-15 at 230 V, 3 A
- Combination voltage, e.g. 24 V AC/DC and 200 to 240 V AC
- Changes to the time setting range during operation
- Changes to the function in the de-energized state
- High level of functionality and a high repeat accuracy of timer settings
- Integrated surge suppressor
- Function charts printed on the side of the device for reliable device adjustment

Application

Timing relays are used in control, starting and protective circuits for all switching operations involving time delays, e.g. in functional buildings, airports, building industry, etc.

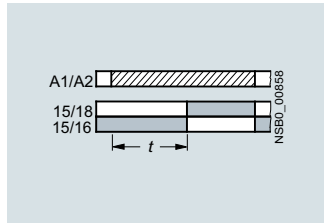
Technical specifications

More information		
Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16358/td		Operating instructions and internal circuit diagrams, see https://support.industry.siemens.com/cs/ww/en/view/35210295
Type		7PV15
Rated insulation voltage	V AC	300
Pollution degree 2, overvoltage category III		
Permissible ambient temperature		
• During operation	°C	-25 ... +55
• During storage	°C	-40 ... +70
Operating range of excitation¹⁾		0.85 ... 1.1 × U_s at V AC/DC, 50/60 Hz 0.8 ... 1.25 × U_s at 24 V DC; 0.95 ... 1.05 times the rated frequency
Rated operational current I_e		
• AC-15 at 24 ... 240 V, 50 Hz	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
Uninterrupted thermal current I_{th}	A	5
Mechanical endurance	Operating cycles	1 × 10 ⁷
Electrical endurance at I_e	Operating cycles	1 × 10 ⁵
Connection type		 Screw terminals
• Terminal screw		M3 (for standard screwdriver, size 2 and Pozidriv 2)
• Solid	mm ²	1 × (0.2 ... 2.5)
• Finely stranded with end sleeve	mm ²	1 × (0.25 ... 1.5)
• Finely stranded without end sleeve	mm ²	1 × (0.2 ... 1.5)
• AWG cables, solid or stranded	AWG	1 × (24 ... 14)
• Tightening torque	Nm	0.4 ... 0.5

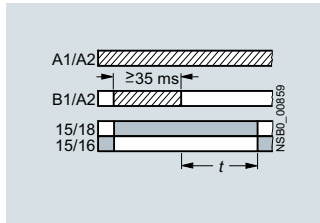
¹⁾ If nothing else is stated.

7PV15 function diagrams

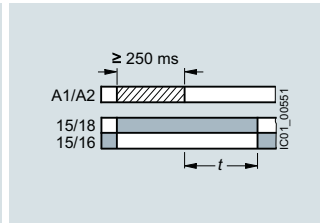
1 CO contact



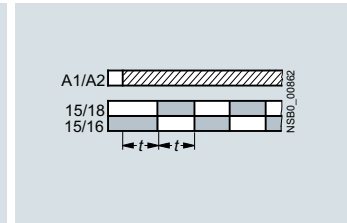
A
7PV1508-1A, 7PV1511, 7PV1512,
7PV1513, 7PV1518
ON-delay



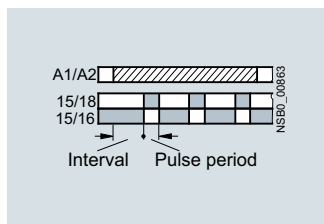
B¹⁾
7PV1508-1A, 7PV1538
OFF-delay with control signal



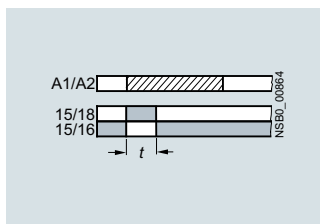
--
7PV1540
OFF-delay without control signal



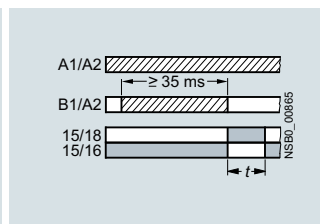
C
7PV1508-1A
Flashing, starting with interval
(pulse/interval 1:1)



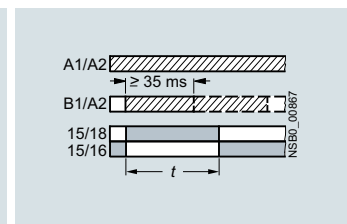
--
7PV1558
Clock-pulse, starting with interval
(dead period, pulse time, and time
setting ranges each separately
adjustable)



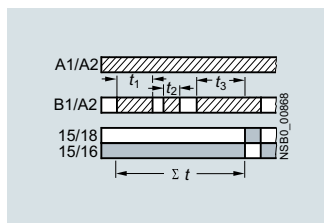
D
7PV1508-1A
Passing make contact



E¹⁾
7PV1508-1A
Passing break contact with control
signal



F¹⁾
7PV1508-1A
Pulse-forming with control signal
(pulse generation at the output
does not depend on duration of energizing)



G¹⁾
7PV1508-1A
Additive ON-delay with control signal

Legend

A ... G Identification letters for 7PV1508

▨ Timing relay energized

■ Contact closed

□ Contact open

¹⁾ Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero (retriggerable). This does not apply to E, F and G, which are not retriggerable.

Note:

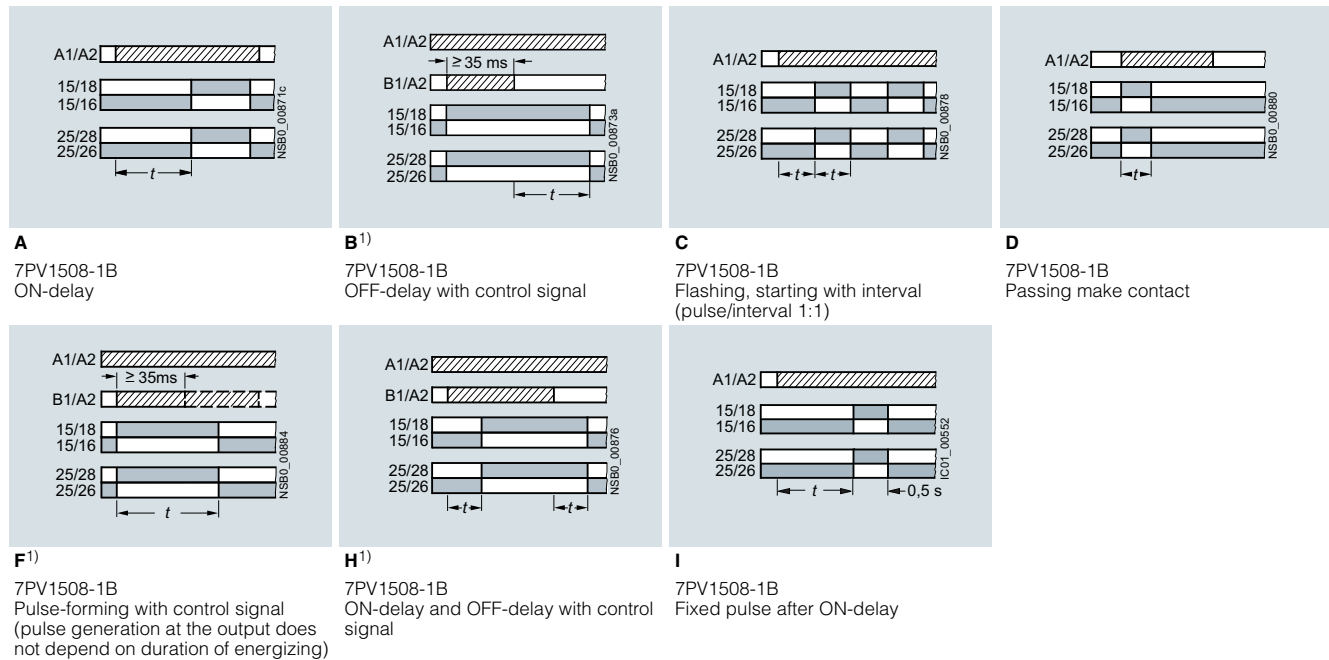
With the 7PV1508-1A multifunctional timing relay the identification letters A to G are printed on the front alongside the rotary selector switch of the unit. The related function can be found in the form of a bar graph on the side of the device.

Relays

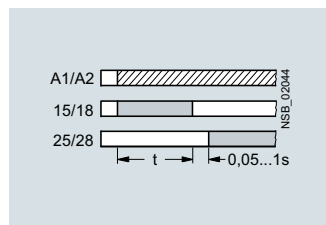
Timing Relays

7PV15 timing relays, 17.5 mm

2 CO contacts



2 NO contacts



Legend

A ... D, F, H, I Identification letters for 7PV1508

▨ Timing relay energized

■ Contact closed

□ Contact open








¹⁾ Note on function with start contact: A new control signal at terminal B, after the operating time has started, resets the operating time to zero (retriggerable). This does not apply to E, F and G, which are not retriggerable.

²⁾ With 7PV1578 the contacts 16 and 26 are not needed for the wye-delta function.

Note:

With the 7PV1508-1B multifunctional timing relay the identification letters A to D, F, H, I are printed on the front alongside the rotary selector switch of the unit. The related function can be found in the form of a bar graph on the side of the device.

Selection and ordering data

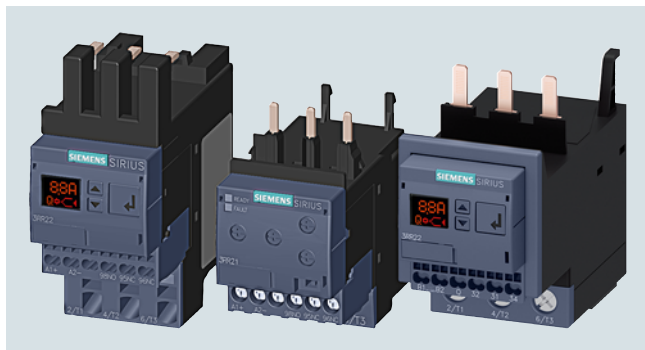
									
7PV1508-1AW30	7PV1512-1AP30	7PV1518-1AW30	7PV1538-1AW30	7PV1540-1AW30	7PV1558-1AW30	7PV1578-1BW30			
Version	Time setting range <i>t</i> adjustable by rotary switch to	Rated control supply voltage <i>U_s</i>		SD	Screw terminals	⊕	PU (UNIT, SET, M)	PS*	PG
		50/60 Hz AC V	DC V	d	Article No.	Price per PU			
7PV1508 timing relays, multifunction, 7 time setting ranges									
The functions can be adjusted by means of rotary switches. The same potential must be applied to terminals A. and B.									
With LED and 1 CO contact, 7 functions	0.05 ... 1 s 0.5 ... 10 s 5 ... 100 s	12 ... 240	12 ... 240	▶	7PV1508-1AW30		1	1 unit	41H
With LED and 2 CO contacts, 7 functions	30 s ... 10 min 3 min ... 1 h 30 min ... 10 h 5 ... 100 h	12 ... 240	12 ... 240	▶	7PV1508-1BW30		1	1 unit	41H
7PV151. timing relays, ON-delay, 1 time setting range									
With LED and 1 CO contact	0.05 ... 1 s	24/200 ... 240	24	▶	7PV1511-1AP30		1	1 unit	41H
	0.5 ... 10 s	24/100 ... 127	24	▶	7PV1512-1AQ30		1	1 unit	41H
		24/200 ... 240	24	▶	7PV1512-1AP30		1	1 unit	41H
	5 ... 100 s	24/100 ... 127	24	▶	7PV1513-1AQ30		1	1 unit	41H
		24/200 ... 240	24	▶	7PV1513-1AP30		1	1 unit	41H
7PV1518 timing relays, ON-delay, 7 time setting ranges									
With LED and 1 CO contact	0.05 ... 1 s	12 ... 240	12 ... 240	▶	7PV1518-1AW30		1	1 unit	41H
	0.5 ... 10 s	90 ... 127	90 ... 127	▶	7PV1518-1AJ30		1	1 unit	41H
	5 ... 100 s								
	30 s ... 10 min	180 ... 240	180 ... 240	▶	7PV1518-1AN30		1	1 unit	41H
	3 min ... 1 h								
	30 min ... 10 h 5 ... 100 h								
7PV1538 timing relays, OFF-delay, with control signal, 7 time setting ranges									
With LED and 1 CO contact	0.05 ... 1 s	12 ... 240	12 ... 240	▶	7PV1538-1AW30		1	1 unit	41H
	0.5 ... 10 s								
	5 ... 100 s								
	30 s ... 10 min								
	3 min ... 1 h								
	30 min ... 10 h								
	5 ... 100 h								
7PV1540 timing relays, OFF-delay, without control signal, 7 time setting ranges									
With LED and 1 CO contact	0.05 ... 1 s	12 ... 240	12 ... 240	▶	7PV1540-1AW30		1	1 unit	41H
	0.15 ... 3s								
	0.3 ... 6 s								
	0.5 ... 10 s								
	1.5 ... 30 s								
	3 ... 60 s								
	5 ... 100 s								
7PV1558 timing relays, clock-pulse relay, 7 time setting ranges									
With LED and 1 CO contact	0.05 ... 1 s	12 ... 240	12 ... 240	▶	7PV1558-1AW30		1	1 unit	41H
	0.5 ... 10 s								
	5 ... 100 s								
	30 s ... 10 min								
	3 min ... 1 h								
	30 min ... 10 h								
	5 ... 100 h								
7PV1578 timing relays, wye-delta function, 7 time setting ranges									
With LED and 2 NO contacts, dead interval 0.05 ... 1 s adjustable	0.05 ... 1 s	12 ... 240	12 ... 240	▶	7PV1578-1BW30		1	1 unit	41H
	0.5 ... 10 s								
	5 ... 100 s								
	30 s ... 10 min								
	3 min ... 1 h								
	30 min ... 10 h								
	5 ... 100 h								

Relays

SIRIUS 3RR21, 3RR22 Monitoring Relays for Mounting onto 3RT2 Contactors

Current and active current monitoring

Overview



SIRIUS 3RR2242, 3RR2142, 3RR2243 current monitoring relays

More information

Homepage, see www.siemens.com/relays

Industry Mall, see www.siemens.com/product?3RR21

The SIRIUS 3RR2 current monitoring relays are suitable for load monitoring of motors or other loads. In two or three phases they monitor the rms value of AC currents for overshooting or undershooting of set threshold values.

Whereas apparent current monitoring is used above all in connection with the rated torque or in case of overload, the active current monitoring option can be used to observe and evaluate the load factor over a motor's entire torque range.

The 3RR2 current monitoring relays can be integrated directly in the feeder by mounting onto the 3RT2 contactor; separate wiring of the main circuit is therefore superfluous. No separate transformers are required.

For a line-oriented configuration or simultaneous use of an overload relay, terminal supports for stand-alone installation are available for separate standard rail mounting.

Versions

Basic versions

The basic versions with two-phase apparent current monitoring, a CO contact output and analog adjustability provide a high level of monitoring reliability especially in the rated and overload range.

Standard versions

The standard versions monitor the current in three phases with selectable active current monitoring. They have additional diagnostics options such as residual-current monitoring and phase sequence monitoring, and they are also suitable for monitoring motors below the rated torque. These devices have an additional independent semiconductor output, an actual value indicator, and are digitally adjustable.

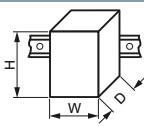
Both versions are available optionally with screw or spring-type terminals, in each case for sizes S00 and S0. With variants of size S2 the main current paths always have screw terminals; the control current side can have screw or spring-type terminals.

Note:

In addition to the features of the standard versions, the 3RR24 monitoring relays for mounting onto 3RT2 contactors for IO-Link also offer the possibility of transmitting the measured values and diagnostics data to a controller via an IO-Link. Furthermore, the devices can be parameterized on the devices themselves or via IO-Link.

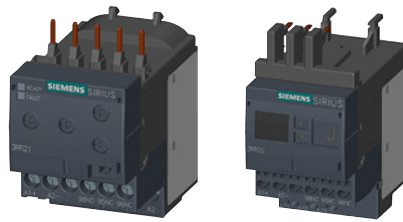
For more information, see page 10/70 onwards.

3RR21 and 3RR22 overview table

Features	3RR21	3RR22	Benefits
General data			
Sizes	S00, S0, S2	S00, S0, S2	<ul style="list-style-type: none"> Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, soft starters, etc.) Permit the mounting of slim-line and compact load feeders in widths of 45 mm (S00 and S0) and 55 mm (S2) Simplify configuration
Dimensions in mm (W x H x D) • Screw terminals 	S00: 45 x 79 x 80, S0: 45 x 87 x 91, S2: 55 x 99 x 112	S00: 45 x 79 x 80, S0: 45 x 87 x 91, S2: 55 x 99 x 112	
• Spring-type terminals	S00: 45 x 90 x 80, S0: 45 x 109 x 92, S2: 55 x 99 x 112	S00: 45 x 90 x 80, S0: 45 x 109 x 92, S2: 55 x 99 x 112	
Current range	S00: 1.6 ... 16 A S0: 4 ... 40 A S2: 8 ... 80 A	S00: 1.6 ... 16 A S0: 4 ... 40 A S2: 8 ... 80 A	<ul style="list-style-type: none"> Is adapted to the other devices in the SIRIUS modular system Just a single version per size with a wide setting range enables easy configuration
Permissible ambient temperature			
During operation	-25 ... +60 °C	-25 ... +60 °C	<ul style="list-style-type: none"> Suitable for applications in the control cabinet, worldwide

SIRIUS 3RR21, 3RR22 Monitoring Relays for Mounting onto 3RT2 Contactors

Current and active current monitoring



Features	3RR21	3RR22	Benefits
Monitoring functions			
Current overshoot	✓ (Two-phase)	✓ (Three-phase)	<ul style="list-style-type: none"> Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload Enables detection of filter blockages or pumping against closed gate valves Enables drawing conclusions about wear, poor lubrication or other maintenance-relevant phenomena
Current undershoot	✓ (Two-phase)	✓ (Three-phase)	<ul style="list-style-type: none"> Enables detection of overload due to a slipping or torn belt Guarantees protection of pumps against dry running Facilitates monitoring of the functions of resistive loads such as heaters Permits energy savings through monitoring of no-load operation
Apparent current monitoring	✓	✓ (Selectable)	<ul style="list-style-type: none"> Precision current monitoring especially in a motor's rated and upper torque range
Active current monitoring	--	✓ (Selectable)	<ul style="list-style-type: none"> Optimum current monitoring over a motor's entire torque range through the patented combination of power factor and apparent current monitoring
Range monitoring	✓ (Two-phase)	✓ (Three-phase)	<ul style="list-style-type: none"> Simultaneous monitoring of current overshoot and undershoot with a single device
Phase failure, open circuit	✓ (Two-phase)	✓ (Three-phase)	<ul style="list-style-type: none"> Minimizes heating of three-phase motors during phase failure through immediate disconnection Prevents operation of hoisting equipment with reduced load carrying capacity
Phase sequence monitoring	--	✓ (Selectable)	<ul style="list-style-type: none"> Prevents starting of motors, pumps or compressors in the wrong direction of rotation
Internal ground-fault detection (residual-current monitoring)	--	✓ (Selectable)	<ul style="list-style-type: none"> Provides optimum protection of loads against high-resistance short circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc. Eliminates the need for additional special equipment and thus space in the control cabinet Reduces wiring overhead and costs
Blocking current monitoring	--	✓ (Selectable)	<ul style="list-style-type: none"> Minimizes heating of three-phase motors when blocked during operation through immediate disconnection Minimizes mechanical loading of the system by acting as an electronic shear pin
Features			
RESET function	✓	✓	<ul style="list-style-type: none"> Allows manual or automatic resetting of the relay Resetting directly on the device or by switching the control supply voltage off and on (remote RESET)
ON-delay time	0 ... 60 s	0 ... 99 s	<ul style="list-style-type: none"> Enables motor starting without evaluation of the starting current Can be used for monitoring motors with lengthy start up
Tripping delay time	0 ... 30 s	0 ... 30 s	<ul style="list-style-type: none"> Permits brief threshold value violations during operation Prevents frequent warnings and disconnections with currents near the threshold values
Operating and indicating elements	LEDs and rotary potentiometers	Displays and buttons	<ul style="list-style-type: none"> For setting the threshold values and delay times and for fast and targeted diagnostics For selectable functions Displays for permanent display of measured values
Integrated contacts	1 CO contact	1 CO contact, 1 semiconductor output	<ul style="list-style-type: none"> Enable disconnection of the system or process when there is an irregularity Can be used to output signals

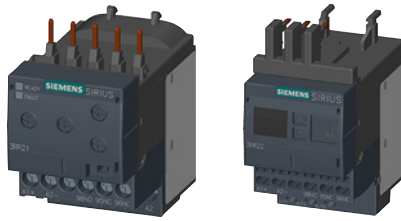
✓ Available

-- Not available

Relays

SIRIUS 3RR21, 3RR22 Monitoring Relays for Mounting onto 3RT2 Contactors

Current and active current monitoring



Features	3RR21	3RR22	Benefits
Design of load feeders			
Short-circuit strength up to 100 kA at 690 V (in conjunction with the corresponding fuses or the corresponding motor starter protector)	✓	✓	<ul style="list-style-type: none"> Provides optimum protection of the loads and operating personnel in the event of short circuits due to insulation faults or faulty switching operations
Electrical and mechanical matching to 3RT2 contactors	✓	✓	<ul style="list-style-type: none"> Simplifies configuration Reduces wiring overhead and costs Enables stand-alone installation as well as space-saving direct mounting
Spring-type terminals for main circuit (with S00, S0) and auxiliary circuits	✓ (optional)	✓ (optional)	<ul style="list-style-type: none"> Enables fast connections Permits vibration-resistant connections Enables maintenance-free connections
Other features			
Suitable for single- and three-phase loads	✓	✓	<ul style="list-style-type: none"> Enables the monitoring of single-phase systems through parallel infeed at the contactor or looping the current through the three phase connections
Wide setting ranges	✓	✓	<ul style="list-style-type: none"> Reduce the number of variants Minimize the configuration overhead and costs Minimize storage overhead, storage costs, tied-up capital
Wide-voltage supply range	✓ (optional)	✓ (optional)	<ul style="list-style-type: none"> Reduces the number of versions Minimizes the configuring overhead and costs Minimizes storage overhead, storage costs, tied-up capital

✓ Available

Possible combinations of 3RR21/3RR22 monitoring relays with 3RT2 contactors

Monitoring relays	Current range	Contactors (type, size, rating)		
Type	A	3RT201 S00 3/4/5.5/7.5 kW	3RT202 S0 5.5/7.5/11/15/18.5 kW	3RT203 S2 18.5/22/30/37 kW
3RR2.41				
3RR2141	1.6 ... 16	✓	With stand-alone installation support	With stand-alone installation support
3RR2241	1.6 ... 16	✓	With stand-alone installation support	With stand-alone installation support
3RR2.42				
3RR2142	4 ... 40	With stand-alone installation support	✓	With stand-alone installation support
3RR2242	4 ... 40	With stand-alone installation support	✓	With stand-alone installation support
3RR2.43				
3RR2143	8 ... 80	With stand-alone installation support	With stand-alone installation support	✓
3RR2243	8 ... 80	With stand-alone installation support	With stand-alone installation support	✓

✓ Available

SIRIUS 3RR21, 3RR22 Monitoring Relays for Mounting onto 3RT2 Contactors

Current and active current monitoring

Article No. scheme

Product versions		Article number									
Monitoring relays		3RR2	□	4	□	–	□	□	□	3	0
Type of setting	Analogically adjustable, two-phase	1									
	Digitally adjustable, three-phase	2									
Size	S00		1								
	S0		2								
	S2		3								
Connection type	Screw terminals						1				
	Spring-type terminals						2				
Number and type of outputs	1 CO contact							A			
	1 CO contact + 1 semiconductor							F			
Rated control supply voltage	24 V AC/DC								A		
	24 ... 240 V AC/DC								W		
Example		3RR2	1	4	1	–	1	A	A	3	0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

- Can be mounted directly on 3RT2 contactors and 3RA23 reversing contactor assemblies, in other words, there is no need for additional wiring in the main circuit
- Optimally coordinated with the technical characteristics of the 3RT2 contactors
- No separate current transformer required
- Versions with wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display of ACTUAL value and status messages
- All versions with removable control current terminals
- All versions with screw terminals or spring-type terminals
- Simple determination of the threshold values through direct reference to actually measured values for setpoint loading
- Range monitoring and selectable active current measurement mean that only one device for monitoring a motor is required along the entire torque curve
- In addition to current monitoring it is also possible to monitor for broken cables, phase failure, phase sequence, residual current and motor blocking

Application

- Monitoring for current overshoot and undershoot
- Monitoring of broken conductors
- 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. on conveyor belts or cranes due to an excessive load
- Monitoring the functionality of electrical loads such as heaters
- Monitoring of wrong phase sequence on mobile equipment such as compressors or cranes
- Monitoring of high-impedance faults to ground, e.g. caused by damaged insulation or moisture

Relays

SIRIUS 3RR21, 3RR22 Monitoring Relays for Mounting onto 3RT2 Contactors

Current and active current monitoring

Technical specifications

More information

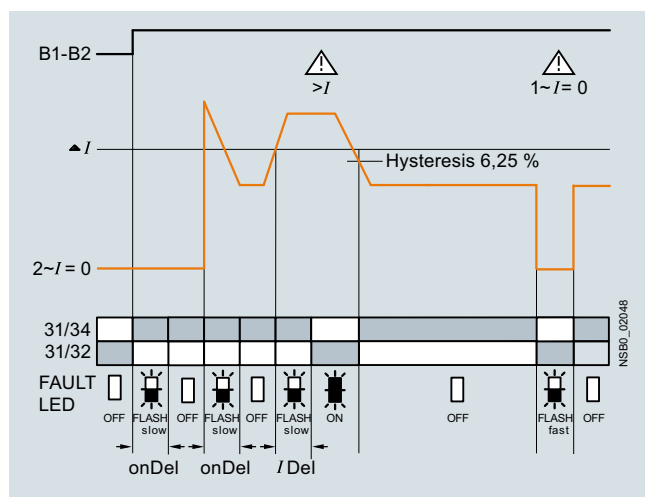
Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16205/td>
 Configuration Manual "Load Feeders – SIRIUS Modular System", see <https://support.industry.siemens.com/cs/ww/en/view/39714188>

System Manual "SIRIUS – System Overview", see <https://support.industry.siemens.com/cs/ww/en/view/60311318>
 Manual, see <https://support.industry.siemens.com/cs/ww/en/view/54397927>
 FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16205/faq>

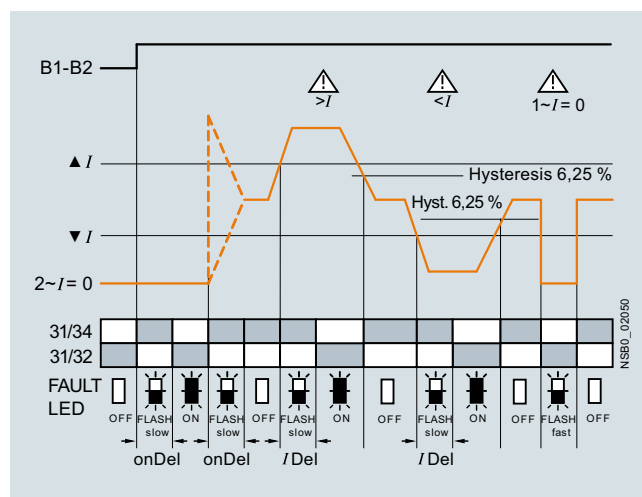
Function diagrams of 3RR214.-A.30 basic versions, analogically adjustable

Closed-circuit principle upon application of the control supply voltage

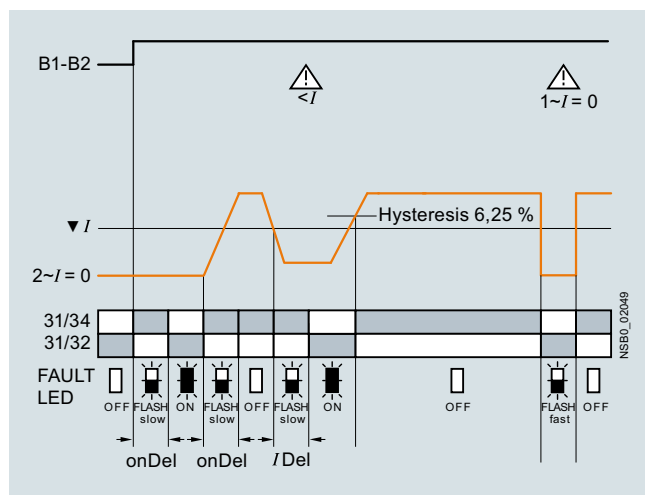
Current overshoot



Range monitoring



Current undershoot



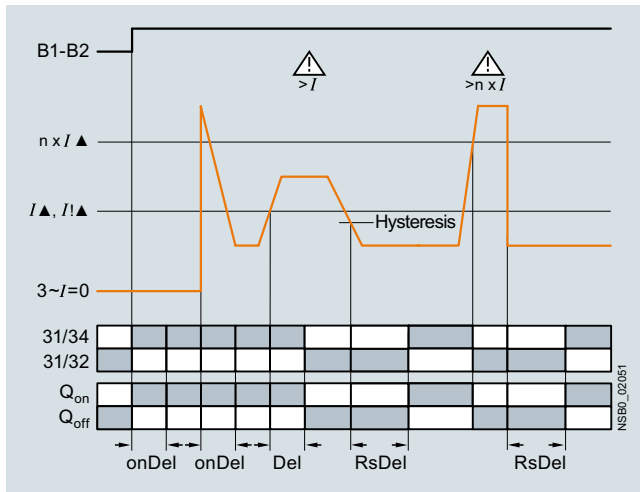
SIRIUS 3RR21, 3RR22 Monitoring Relays for Mounting onto 3RT2 Contactors

Current and active current monitoring

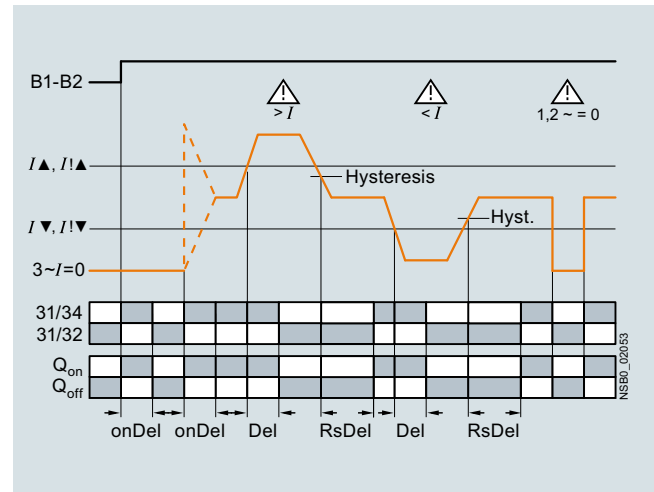
Function diagrams of 3RR224.-F.30 standard versions, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

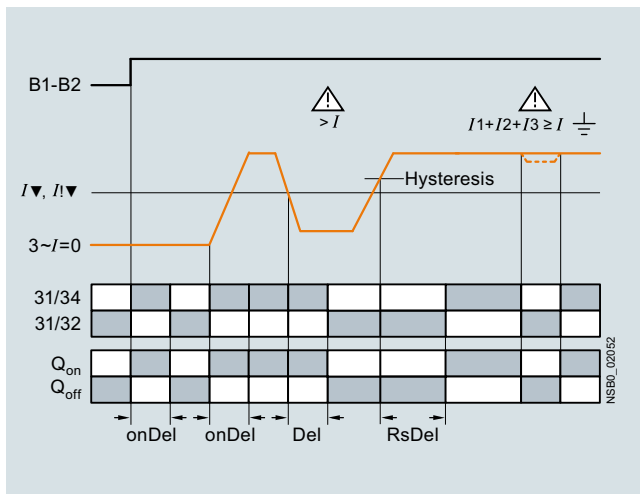
Current overshoot



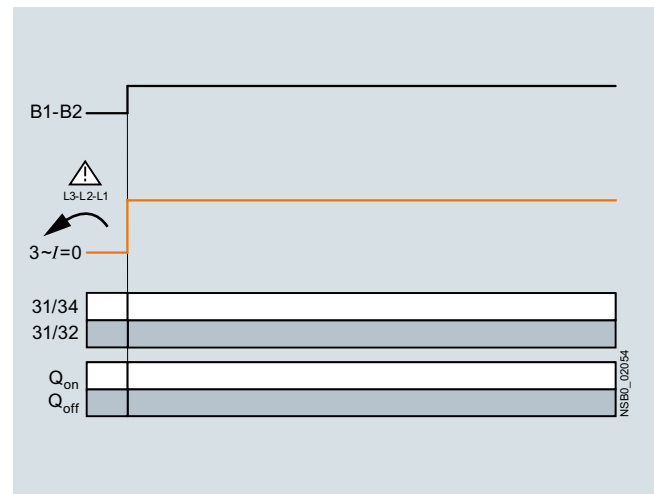
Range monitoring



Current undershoot with residual-current monitoring



Phase sequence monitoring



Relays

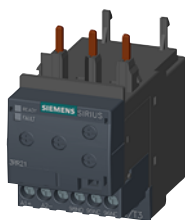
SIRIUS 3RR21, 3RR22 Monitoring Relays for Mounting onto 3RT2 Contactors

Current and active current monitoring

Selection and ordering data



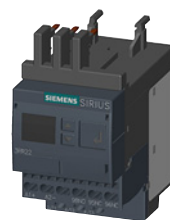
3RR2141-1AW30



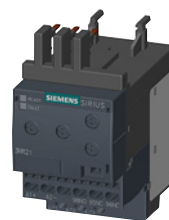
3RR2142-1AW30



3RR2241-1FW30



3RR2242-2FW30



3RR2141-2AA30



3RR2243-2FW30

Size	Measuring range	Hysteresis	Supply voltage U_s	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	A	A	V	d					
Basic versions									
<ul style="list-style-type: none"> Analogically adjustable Closed-circuit principle 1 CO contact Two-phase current monitoring Apparent current monitoring Start-up delay 0 ... 60 s Tripping delay 0 ... 30 s 									
S00	1.6 ... 16	6.25% of threshold value	24 AC/DC 24 ... 240 AC/DC	2 2	3RR2141-□AA30 3RR2141-□AW30		1 1	1 unit 1 unit	41H 41H
S0	4 ... 40	6.25% of threshold value	24 AC/DC 24 ... 240 AC/DC	2 2	3RR2142-□AA30 3RR2142-□AW30		1 1	1 unit 1 unit	41H 41H
S2	8 ... 80	6.25% of threshold value	24 AC/DC 24 ... 240 AC/DC	2 2	3RR2143-□AA30 3RR2143-□AW30		1 1	1 unit 1 unit	41H 41H
Standard versions									
<ul style="list-style-type: none"> Digitally adjustable LC display Open- or closed-circuit principle 1 CO, 1 semiconductor output Three-phase current monitoring Active current or apparent current monitoring Phase sequence monitoring Residual-current monitoring Blocking current monitoring Reclosing delay time 0 ... 300 min Start-up delay 0 ... 99 s Separate settings for warning and alarm thresholds Tripping delay 0 ... 30 s 									
S00	1.6 ... 16	0.1 ... 3	24 AC/DC 24 ... 240 AC/DC	2 2	3RR2241-□FA30 3RR2241-□FW30		1 1	1 unit 1 unit	41H 41H
S0	4 ... 40	0.1 ... 8	24 AC/DC 24 ... 240 AC/DC	2 2	3RR2242-□FA30 3RR2242-□FW30		1 1	1 unit 1 unit	41H 41H
S2	8 ... 80	0.2 ... 16	24 AC/DC 24 ... 240 AC/DC	2 2	3RR2243-□FA30 3RR2243-□FW30		1 1	1 unit 1 unit	41H 41H
Type of electrical connection									
<ul style="list-style-type: none"> Screw terminals Spring-type terminals 									

1
2

SIRIUS 3RR21, 3RR22 Monitoring Relays for Mounting onto 3RT2 Contactors

Current and active current monitoring

Accessories

Use	Version	Size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
d								
Terminal supports for stand-alone installation ¹⁾								
	For 3RR21, 3RR22	For separate mounting of the overload relays or monitoring relays; screw and snap-on mounting onto TH 35 standard mounting rail according to IEC 60715		Screw terminals 				
3RU2916-3AA01		• Screw connection	S00 ▶ S0 ▶ S2 ▶	3RU2916-3AA01 3RU2926-3AA01 3RU2936-3AA01	1 1 1	1 unit 1 unit 1 unit	41F 41F 41F	
								
3RU2936-3AA01								
		• Spring-type connection	S00 ▶ S0 ▶	Spring-type terminals 				
3RU2926-3AC01				3RU2916-3AC01 3RU2926-3AC01	1 1	1 unit 1 unit	41F 41F	
Blank labels								
	For 3RR21, 3RR22	Unit labeling plates²⁾ For SIRIUS devices, 20 mm x 7 mm, titanium gray		20	3RT2900-1SB20	100	340 units	41B
3RT2900-1SB20								
Sealable covers								
	For 3RR21, 3RR22	Sealable covers For securing against unintentional or unauthorized adjustment of settings		2	3RR2940	1	5 units	41H
3RR2940								
Tools for opening spring-type terminals								
	For auxiliary circuit connections	Screwdrivers For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated		2	Spring-type terminals 			
3RA2908-1A				3RA2908-1A	1	1 unit	41B	

¹⁾ The accessories are exactly the same as the accessories for the 3RU21 thermal overload relay and the 3RB3 electronic overload relay, see page 7/96 onwards.

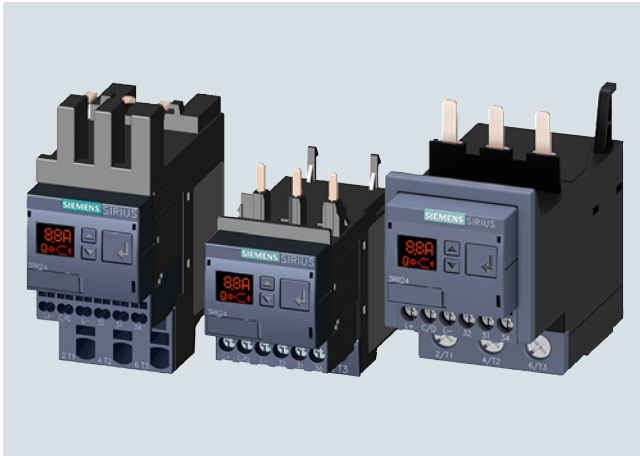
²⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH, see page 16/16.

Relays

SIRIUS 3RR24 Monitoring Relays for Mounting onto 3RT2 Contactors for IO-Link

Current and active current monitoring

Overview



SIRIUS 3RR2441, 3RR2442 and 3RR2443 current monitoring relays

More information

Homepage, see www.siemens.com/relays

Industry Mall, see www.siemens.com/product?3RR24

The SIRIUS 3RR24 current monitoring relays for IO-Link are suitable for the load monitoring of motors or other loads. In three phases they monitor the rms value of AC currents for overshooting or undershooting of set threshold values.

Whereas apparent current monitoring is used above all in connection with the rated torque or in case of overload, the active current monitoring option, which is also selectable, can be used to observe and evaluate the load factor over a motor's entire torque range.

The 3RR24 current monitoring relays for IO-Link can be integrated directly in the feeder by mounting onto the 3RT2 contactor; separate wiring of the main circuit is therefore superfluous. No separate transformers are required.

For a line-oriented configuration or simultaneous use of an overload relay, terminal supports for stand-alone installation are available for separate standard rail mounting.

The SIRIUS 3RR24 current monitoring relays for IO-Link also offer many other options based upon the monitoring functions of the conventional SIRIUS 3RR2 monitoring relays:

- Measured value transmission to a controller, including resolution and unit, may be parameterizable as to which value is cyclically transmitted
- Transmission of alarm flags to a controller
- Full diagnosis capability by inquiry as to the cause of the fault in the diagnosis data record
- Remote parameterization is also possible, in addition to or instead of local parameterization

- Rapid parameterization of the same devices by duplication of the parameterization in the controller
- Parameter transmission through upload to a controller by IO-Link call or by parameter server (if IO-Link master from IO-Link Specification V1.1 and higher is used)
- Consistent central data storage in the event of parameter change locally or via a controller
- Automatic reparameterizing when devices are exchanged
- Blocking of local parameterization via IO-Link possible
- Faults are saved in parameterizable and non-volatile fashion to prevent an automatic start-up after voltage failure and make sure diagnosis data is not lost
- Integration into the automation level provides the option of parameterizing the monitoring relays at any time via a display unit, or displaying the measured values in a control room or locally at the machine/control cabinet

Even without communication via IO-Link the devices continue to function fully autonomously:

- Parameterization can take place locally at the device, independently of a controller.
- In the event of failure or before the controller becomes available the monitoring relays work as long as the control supply voltage (24 V DC) is present.
- If the monitoring relays are operated without the controller, the 3RR24 monitoring relays for IO-Link have, thanks to the integrated SIO mode, an additional semiconductor output, which switches when the adjustable warning threshold is exceeded.

Thanks to the combination of autonomous monitoring relay function and integrated IO-Link communication, redundant sensors and/or analog signal converters – which previously took over the transmission of measured values to a controller, leading to considerable extra cost and wiring overhead – are no longer needed.

Because the output relays are still present, the monitoring relays increase the functional reliability of the system, since only the controller can fulfill the control tasks if the current measured values are available, whereas the output relays can also be used for the disconnection of the system if limit values that cannot be reached during operation are exceeded.

For more information on the IO-Link communication system, see [page 2/97 onwards](#).

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions represent only one component of such a concept.

For more information on Industrial Security, see www.siemens.com/industrialsecurity.

SIRIUS 3RR24 Monitoring Relays for Mounting onto 3RT2 Contactors for IO-Link

Current and active current monitoring

3RR24 overview table



Features	3RR24	Benefits
General data		
Sizes Dimensions in mm (W x H x D) • Screw terminals • Spring-type terminals	 S00, S0, S2 S00: 45 x 79 x 80, S0: 45 x 87 x 91, S2: 55 x 99 x 112 S00: 45 x 90 x 80, S0: 45 x 109 x 92, S2: 55 x 99 x 112	<ul style="list-style-type: none"> • Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, soft starters, etc.) • Permit the mounting of slim-line and compact load feeders in widths of 45 mm (S00 and S0) and 55 mm (S2) • Simplify configuration
Current range	S00: 1.6 ... 16 A S0: 4 ... 40 A S2: 8 ... 80 A	<ul style="list-style-type: none"> • Is adapted to the other devices in the SIRIUS modular system • Just a single version per size with a wide setting range enables easy configuration
Permissible ambient temperature		
During operation	-25 ... +60 °C	<ul style="list-style-type: none"> • Suitable for applications in the control cabinet, worldwide
Monitoring functions		
Current overshoot	✓ (Three-phase)	<ul style="list-style-type: none"> • Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload • Enables detection of filter blockages or pumping against closed gate valves • Enables drawing conclusions about wear, poor lubrication or other maintenance-relevant phenomena
Current undershoot	✓ (Three-phase)	<ul style="list-style-type: none"> • Enables detection of overload due to a slipping or torn belt • Guarantees protection of pumps against dry running • Facilitates monitoring of the functions of resistive loads such as heaters • Permits energy savings through monitoring of no-load operation
Apparent current monitoring	✓ (Selectable)	<ul style="list-style-type: none"> • Precision current monitoring especially in a motor's rated and upper torque range
Active current monitoring	✓ (Selectable)	<ul style="list-style-type: none"> • Optimum current monitoring over a motor's entire torque range through the patented combination of power factor and apparent current monitoring
Range monitoring	✓ (Three-phase)	<ul style="list-style-type: none"> • Simultaneous monitoring of current overshoot and undershoot with a single device
Phase failure, open circuit	✓ (Three-phase)	<ul style="list-style-type: none"> • Minimizes heating of three-phase motors during phase failure through immediate disconnection • Prevents operation of hoisting equipment with reduced load carrying capacity
Phase sequence monitoring	✓ (Selectable)	<ul style="list-style-type: none"> • Prevents starting of motors, pumps or compressors in the wrong direction of rotation
Internal ground-fault detection (residual-current monitoring)	✓ (Selectable)	<ul style="list-style-type: none"> • Provides optimum protection of loads against high-resistance short circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc. • Eliminates the need for additional special equipment • Saves space in the control cabinet • Reduces wiring overhead and costs
Blocking current monitoring	✓ (Selectable)	<ul style="list-style-type: none"> • Minimizes heating of three-phase motors when blocked during operation through immediate disconnection • Minimizes mechanical loading of the system by acting as an electronic shear pin
Operating hours counter	✓	<ul style="list-style-type: none"> • Gives the time during which there was a measurable current in at least 2 current paths • As an indicator for upcoming maintenance or replacement of machine and system components
Operating cycles counter	✓	<ul style="list-style-type: none"> • Is incremented by one each time a breaking operation is detected, in other words a transition from three-phase current flow to no measurable current flow • As an indicator for upcoming maintenance or replacement of contact blocks

✓ Available

Relays

SIRIUS 3RR24 Monitoring Relays for Mounting onto 3RT2 Contactors for IO-Link

Current and active current monitoring



Features	3RR24	Benefits
Features		
RESET function	✓	<ul style="list-style-type: none"> Allows manual or automatic resetting of the relay Resetting directly on the device, by switching the control supply voltage off and on or via IO-Link (remote RESET)
ON-delay time	0 ... 999.9 s	<ul style="list-style-type: none"> Enables motor starting without evaluation of the starting current Can be used for monitoring motors with lengthy start up
Tripping delay time	0 ... 999.9 s	<ul style="list-style-type: none"> Permits brief threshold value violations during operation Prevents frequent warnings and disconnections with currents near the threshold values
Operating and indicating elements	Displays and buttons	<ul style="list-style-type: none"> For setting the threshold values and delay times For selectable functions For quick and selective diagnostics Displays for permanent display of measured values
Integrated contacts	1 CO contact, 1 semiconductor output (in SIO mode)	<ul style="list-style-type: none"> Enable disconnection of the system or process when there is an irregularity Can be used to output signals
Design of load feeders		
Short-circuit strength up to 100 kA at 690 V (in conjunction with the corresponding fuses or the corresponding motor starter protector)	✓	<ul style="list-style-type: none"> Provides optimum protection of the loads and operating personnel in the event of short circuits due to insulation faults or faulty switching operations
Electrical and mechanical matching to 3RT2 contactors	✓	<ul style="list-style-type: none"> Simplifies configuration Reduces wiring overhead and costs Enables stand-alone installation as well as space-saving direct mounting
Spring-type terminals for main circuit (with S00, S0) and auxiliary circuits	✓ (optional)	<ul style="list-style-type: none"> Enables fast connections Permits vibration-resistant connections Enables maintenance-free connections
Other features		
Suitable for single- and three-phase loads	✓	<ul style="list-style-type: none"> Enables the monitoring of single-phase systems through parallel infeed at the contactor or looping the current through the three phase connections
Wide setting ranges	✓	<ul style="list-style-type: none"> Reduce the number of variants Minimize the configuration overhead and costs Minimize storage overhead, storage costs, tied-up capital
Power supply	24 V DC	<ul style="list-style-type: none"> Direct via IO-Link master or via an external auxiliary voltage independent of the IO-Link Minimizes the configuring overhead and costs

✓ Available

Possible ways of combining the 3RR24 monitoring relay with the 3RT2 contactor for IO-Link

Monitoring relays	Current range	Contactors (type, size, rating)		
		3RT201 S00 3/4/5.5/7.5 kW	3RT202 S0 5.5/7.5/11/15/18.5 kW	3RT203 S2 18.5/22/30/37 kW
Type	A			
3RR2441	1.6 ... 16	✓	With stand-alone installation support	With stand-alone installation support
3RR2442	4 ... 40	With stand-alone installation support	✓	With stand-alone installation support
3RR2443	8 ... 80	With stand-alone installation support	With stand-alone installation support	✓

✓ Available

Notes:

Devices required for the communication via IO-Link:

- Any controller that supports the IO-Link (e.g. ET 200SP with CPU or S7-1200); [see Catalog ST 70](#).
- IO-Link master (e.g. CM 4xIO-Link for SIMATIC ET 200SP, [see page 2/105](#) or SM 1278 for S7-1200, [see page 2/104](#)).

Each monitoring relay requires an IO-Link channel.

SIRIUS 3RR24 Monitoring Relays for Mounting onto 3RT2 Contactors for IO-Link

Current and active current monitoring

Article No. scheme

Product versions		Article number									
3RR24 monitoring relay, digitally adjustable with IO-Link		3RR2	4	4	<input type="checkbox"/>	–	<input type="checkbox"/>	A	A	4	0
Size	S00				1						
	S0				2						
	S2				3						
Connection type	Screw terminals						1				
	Spring-type terminals						2				
Example		3RR2	4	4	1	–	1	A	A	4	0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

- Can be mounted directly on 3RT2 contactors and 3RA23 reversing contactor assemblies, in other words, there is no need for additional wiring in the main circuit
- Optimally coordinated with the technical characteristics of the 3RT2 contactors
- No separate current transformer required
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display of ACTUAL value and status messages
- All versions with removable control current terminals
- All versions with screw or spring-type terminals
- Simple determination of the threshold values through direct reference to actually measured values for setpoint loading
- Range monitoring and selectable active current measurement mean that only one device for monitoring a motor is required along the entire torque curve
- In addition to current monitoring it is also possible to monitor for current unbalance, broken cables, phase failure, phase sequence, residual current and motor blocking
- Integrated counter for operating cycles and operating hours to support requirements-based maintenance of the monitored machine or application
- Simple cyclical transmission of the current measured values, relay switching states and events to a controller
- Remote parameterization
- Automatic reparameterizing when devices are exchanged
- Simple duplication of identical or similar parameterizations
- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration overhead
- Integration in TIA means clear diagnostics if a fault occurs
- Cost saving and space saving in control cabinet due to the elimination of AI and IO modules as well as analog signal converters and duplicated sensors

Application

- Monitoring for current overshoot and undershoot
- Monitoring of broken conductors
- 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. on pumps due to a dirty filter system
- Monitoring the functionality of electrical loads such as heaters
- Monitoring of wrong phase sequence on mobile equipment such as compressors or cranes
- Monitoring of high-impedance faults to ground, e.g. caused by damaged insulation or moisture

The use of SIRIUS monitoring relays for IO-Link is particularly recommended for machines and plants in which these relays, in addition to their monitoring function, are to be connected to the automation level for the rapid, simple and fault-free provision of the current measured values and/or for remote parameterization.

The monitoring relays can either relieve the controller of monitoring tasks or, as a second monitoring entity in parallel to and independent of the controller, increase the reliability in the process or in the system. In addition, the elimination of AI and IO modules allows the width of the controller to be reduced despite significantly expanded functionality.

Relays

SIRIUS 3RR24 Monitoring Relays for Mounting onto 3RT2 Contactors for IO-Link

Current and active current monitoring

Technical specifications

More information

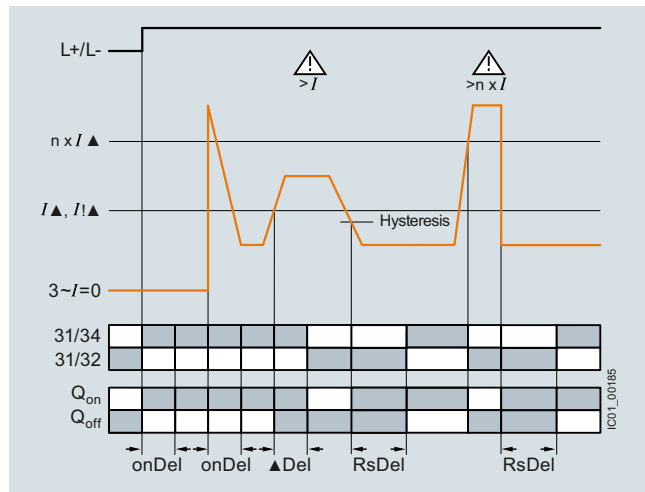
Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16206/td>
 Configuration Manual "Load Feeders – SIRIUS Modular System", see <https://support.industry.siemens.com/cs/ww/en/view/39714188>

System Manual "SIRIUS – System Overview", see <https://support.industry.siemens.com/cs/ww/en/view/60311318>
 Manual, see <https://support.industry.siemens.com/cs/ww/en/view/54375430>
 FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16206/faq>

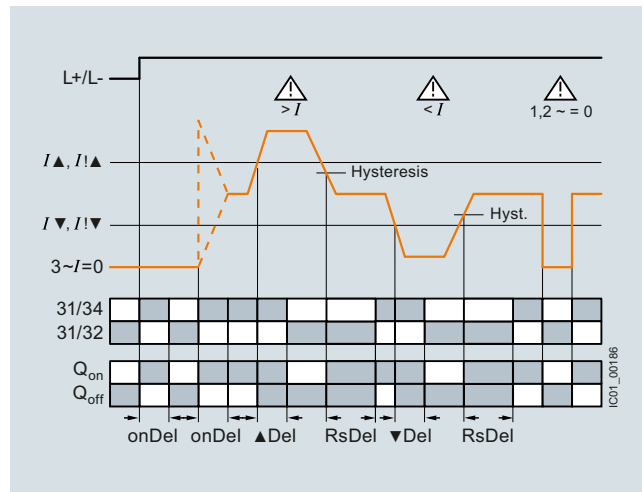
Function diagrams of 3RR24 for IO-Link, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

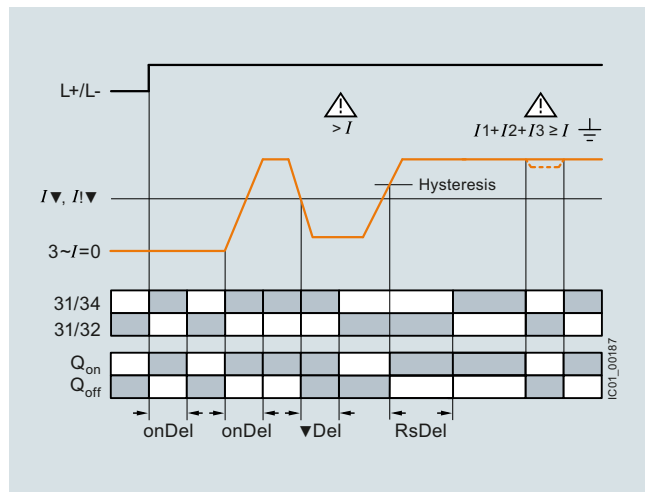
Current overshoot



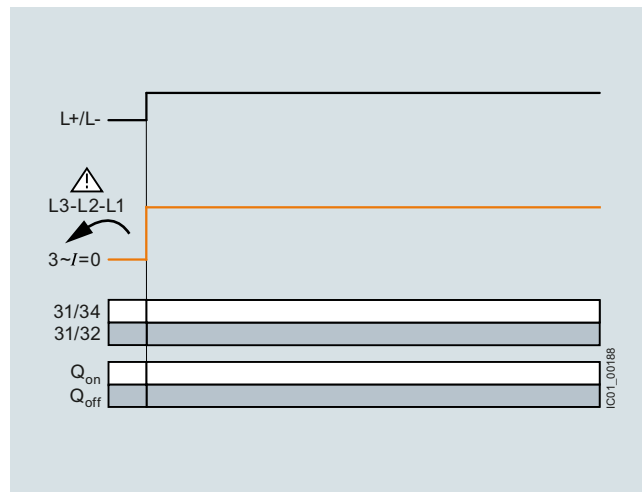
Range monitoring



Current undershoot with residual-current monitoring



Phase sequence monitoring

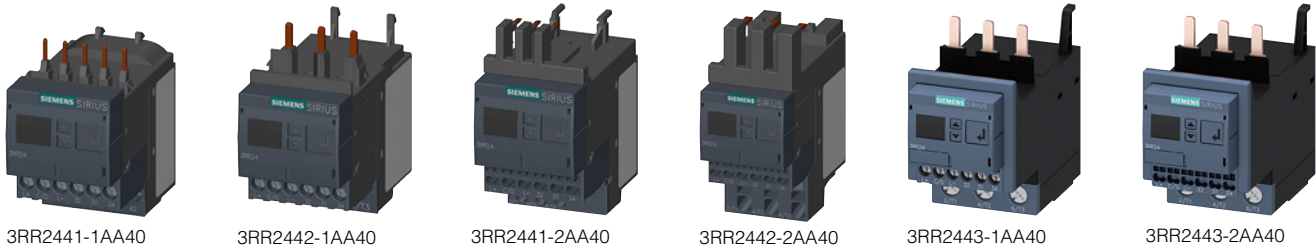


SIRIUS 3RR24 Monitoring Relays for Mounting onto 3RT2 Contactors for IO-Link

Current and active current monitoring

Selection and ordering data

SIRIUS 3RR24 current monitoring relays for IO-Link



Size	Measuring range	Hysteresis	Supply voltage U_s	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
A	A	A	V	d					
<ul style="list-style-type: none"> Digitally adjustable LC display Open- or closed-circuit principle 1 CO contact 1 semiconductor output (in SIO mode) Three-phase current monitoring Active current or apparent current monitoring Current unbalance monitoring Phase sequence monitoring Residual-current monitoring Blocking current monitoring Operating hours counter Operating cycles counter Reclosing delay time 0 ... 300 min Start-up delay 0 ... 999.9 s Tripping delay 0 ... 999.9 s Separate settings for warning and alarm thresholds Auto or Manual RESET 									
S00	1.6 ... 16	0.1 ... 3	24 DC	2	3RR2441-□AA40		1	1 unit	41H
S0	4 ... 40	0.1 ... 8	24 DC	2	3RR2442-□AA40		1	1 unit	41H
S2	8 ... 80	0.2 ... 16	24 DC	2	3RR2443-□AA40		1	1 unit	41H

Type of electrical connection

- Screw terminals
- Spring-type terminals






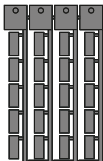



1
2

Relays

SIRIUS 3RR24 Monitoring Relays for Mounting onto 3RT2 Contactors for IO-Link

Current and active current monitoring

Accessories

Use	Version	Size	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
d								
Terminal supports for stand-alone installation ¹⁾								
 3RU2916-3AA01	For 3RR24	For separate mounting of the overload relays or monitoring relays; screw and snap-on mounting onto TH 35 standard mounting rail according to IEC 60715		Screw terminals 				
 3RU2936-3AA01		• Screw connection	S00	▶	3RU2916-3AA01	1	1 unit	41F
			S0	▶	3RU2926-3AA01	1	1 unit	41F
		S2	▶	3RU2936-3AA01	1	1 unit	41F	
 3RU2926-3AC01	For 3RR24	• Spring-type connection		Spring-type terminals 				
			S00	▶	3RU2916-3AC01	1	1 unit	41F
			S0	▶	3RU2926-3AC01	1	1 unit	41F
Blank labels								
 3RT2900-1SB20	For 3RR24	Unit labeling plates²⁾ For SIRIUS devices 20 mm x 7 mm, titanium gray		20	3RT2900-1SB20	100	340 units	41B
Sealable covers								
 3RR2940	For 3RR24	Sealable covers For securing against unintentional or unauthorized adjustment of settings		2	3RR2940	1	5 units	41H
Tools for opening spring-type terminals								
 3RA2908-1A	For auxiliary circuit connections	Screwdrivers For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated		2	Spring-type terminals  3RA2908-1A	1	1 unit	41B

¹⁾ The accessories are exactly the same as the accessories for the 3RU21 thermal overload relay and the 3RB3 electronic overload relay, see page 7/96 onwards.

²⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH, see page 16/16.

Overview



SIRIUS 3UG4 monitoring relay

More information

Homepage, see www.siemens.com/relays

Industry Mall, see www.siemens.com/product?3UG45

For the conversion tool, e.g. from 3UG3 to 3UG4, see www.siemens.com/sirius/conversion-tool

The field-proven SIRIUS monitoring relays for electrical and mechanical variables enable constant monitoring of all important characteristic quantities that provide information about the functional capability of a plant. Both sudden disturbances and gradual changes, which may indicate the need for maintenance, are detected. Thanks to their relay outputs, the monitoring relays permit direct disconnection of the affected system components as well as alerting (e.g. by switching a warning lamp).

Thanks to adjustable delay times the monitoring relays can respond very flexibly to brief faults such as voltage dips or load changes. This avoids unnecessary alarms and disconnections while enhancing plant availability.

The individual 3UG4 monitoring relays offer the following functions in various combinations:

- Undershooting and/or overshooting of liquid levels
- Phase sequence
- Phase failure, neutral conductor failure
- Phase asymmetry
- Undershooting and/or overshooting of limit values for voltage
- Undershooting and/or overshooting of limit values for current
- Undershooting and/or overshooting of limit values for power factor
- Monitoring of the active current or the apparent current
- Monitoring of the residual current
- Monitoring of the insulation resistance
- Undershooting and/or overshooting of limit values for speed

Article No. scheme

Product versions		Article number									
Monitoring relays		3UG4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0
Type of setting	e. g. 5 = analogically adjustable		<input type="checkbox"/>								
Functions	e.g. 11 = line monitoring			<input type="checkbox"/>	<input type="checkbox"/>						
Connection type	Screw terminals					1					
	Spring-type terminals					2					
Contacts	e.g. A = 1 CO contact						<input type="checkbox"/>				
Supply voltage	e.g. N2 = 160 ... 260 V AC							<input type="checkbox"/>	<input type="checkbox"/>		
Example		3UG4	5	1	1	-	1	A	N	2	0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

General data

Benefits

- Customary screw and spring-type terminals for quick and reliable wiring
- Fast commissioning thanks to menu-guided parameterization and actual value display for limit value determination
- Reduced space requirement in the control cabinet thanks to a consistent width of 22.5 mm
- Parameterizable monitoring functions, delay times, RESET response, etc.
- Reduced stockkeeping thanks to minimized variance and large measuring ranges
- Wide-voltage power supply units for global applicability
- Device replacement without renewed wiring thanks to removable terminals
- Reliable system diagnostics thanks to actual value display and connectable fault memory
- Rapid diagnostics thanks to unambiguous error messages on the display

Application

The SIRIUS 3UG4 monitoring relays monitor the most diverse electrical and mechanical quantities in the feeder, and provide reliable protection against damage in the plant. For this purpose, they offer freely parameterizable limit values and diverse options for adapting to the respective task, and in the event of a fault, they provide clear diagnostics information.

The digitally adjustable products also display the current measured values direct on the device. This not only facilitates the display of valuable plant status information during operation, it also enables adjustment of the monitored limit values in accordance with the actual conditions.

The positive result: More selective avoidance of production faults – sustained increases in availability and productivity.

The 3UG4 monitoring relays are available for the following applications:

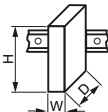
- Line and single-phase voltage monitoring
- Single-phase current monitoring or power factor and active current monitoring
- Residual-current monitoring
- Insulation monitoring
- Level monitoring
- Speed monitoring

Technical specifications

More information

Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16367/td>
Manual and internal circuit diagrams, see <https://support.industry.siemens.com/cs/ww/en/view/54397927>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16367/faq>

Type	3UG		
General data			
Dimensions (W x H x D)			
• For 2 terminal blocks			
- Screw terminals		mm	22.5 x 83 x 91
- Spring-type terminals		mm	22.5 x 84 x 91
• For 3 terminal blocks			
- Screw terminals		mm	22.5 x 92 x 91
- Spring-type terminals	mm	22.5 x 94 x 91	
• For 4 terminal blocks			
- Screw terminals	mm	22.5 x 103 x 91	
- Spring-type terminals	mm	22.5 x 103 x 91	
Permissible ambient temperature			
• During operation	°C	-25 ... +60	
Connection type		⊕ Screw terminals	
• Terminal screw		M3 (for standard screwdriver, size 2 and Pozidriv 2)	
• Solid	mm ²	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)	
Connection type		⊙ Spring-type terminals	
• Solid	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded, with end sleeve acc. to DIN 46228	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded	mm ²	2 x (0.25 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)	

Overview



SIRIUS 3UG4615 monitoring relay

Electronic line monitoring relays provide maximum protection for mobile machines and plants or for unstable networks. Network and voltage faults can thus be detected early and rectified before far greater damage ensues.

Depending on the version, the relays monitor phase sequence, phase failure with and without N conductor monitoring, phase asymmetry, undervoltage or overvoltage.

Phase asymmetry is evaluated as the difference between the greatest and the smallest phase voltage relative to the greatest phase voltage. Undervoltage or overvoltage exists when at least one phase voltage deviates by 20% from the set rated system voltage or the directly set limit values are overshoot or undershot. The rms value of the voltage is measured.

With the 3UG4617 or 3UG4618 relay, a wrong direction of rotation can also be corrected automatically.

Benefits

- Can be used without auxiliary voltage in any network from 160 to 630 V AC worldwide thanks to wide voltage range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Permanent display of actual value and line fault type on the digital versions
- Automatic correction of the direction of rotation by distinguishing between power system faults and wrong phase sequence
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The relays are used above all for mobile equipment, e.g. air conditioning compressors, refrigerating containers, building site compressors and cranes.

Function	Application
Phase sequence	<ul style="list-style-type: none"> • Direction of rotation of the drive
Phase failure	<ul style="list-style-type: none"> • A fuse has tripped • Failure of the control supply voltage • Broken cable
Phase asymmetry	<ul style="list-style-type: none"> • Overheating of the motor due to asymmetrical voltage • Detection of asymmetrically loaded networks
Undervoltage	<ul style="list-style-type: none"> • Increased current on a motor with corresponding overheating • Unintentional resetting of a device • Network collapse, particularly with battery power
Overvoltage	<ul style="list-style-type: none"> • Protection of a plant against destruction due to overvoltage

Technical specifications

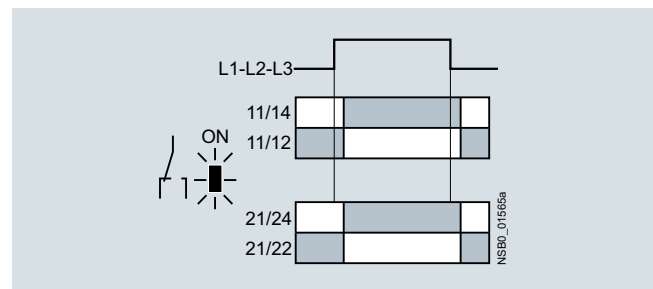
3UG4511 monitoring relays

The 3UG4511 phase sequenced relay monitors the phase sequence in a three-phase network. No adjustments are required for operation. The device has an internal power supply and works using the closed-circuit principle. If the phase sequence at the terminals L1-L2-L3 is correct, the output relay picks up after the delay time has elapsed and the LED is lit. If the phase sequence is wrong, the output relay remains in its rest position.

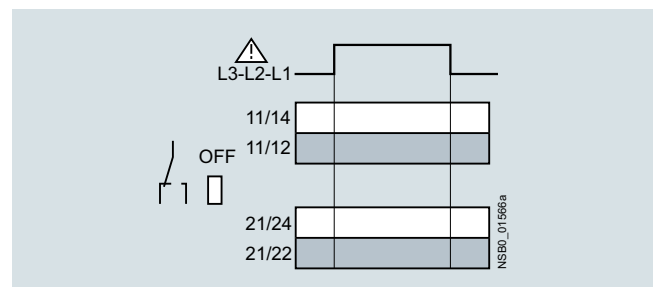
Note:

When one phase fails, connected loads (motor windings, lamps, transformers, coils, etc.) create a feedback voltage at the terminal of the failed phase due to the network coupling. Because the 3UG4511 relays are not resistant to voltage feedback, such a phase failure is not detected. Should this be required, then the 3UG4512 monitoring relay must be used.

Correct phase sequence



Wrong phase sequence



Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Line monitoring

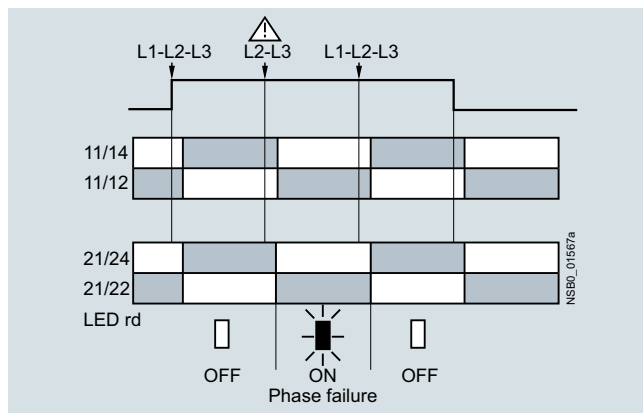
3UG4512 monitoring relays

The 3UG4512 line monitoring relay monitors three-phase networks with regard to phase sequence, phase failure and phase unbalance of 10%. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V AC and feedback through the load of up to 90%. The device has an internal power supply and works using the closed-circuit principle. No adjustments are required. If the line voltage is switched on, the green LED will light up. If the phase sequence at the terminals L1-L2-L3 is correct, the output relay picks up. If the phase sequence is wrong, the red LED flashes and the output relay remains in its rest position. If a phase fails, the red LED is permanently lit and the output relay drops.

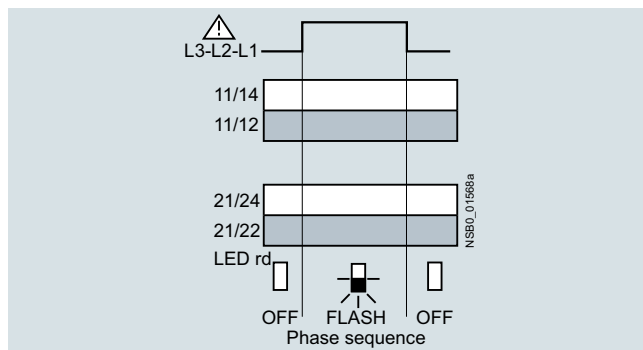
Note:

The red LED is a fault diagnostic indicator and does not show the current relay status. The 3UG4512 monitoring relay is suitable for line frequencies of 50/60 Hz.

Phase failure



Wrong phase sequence



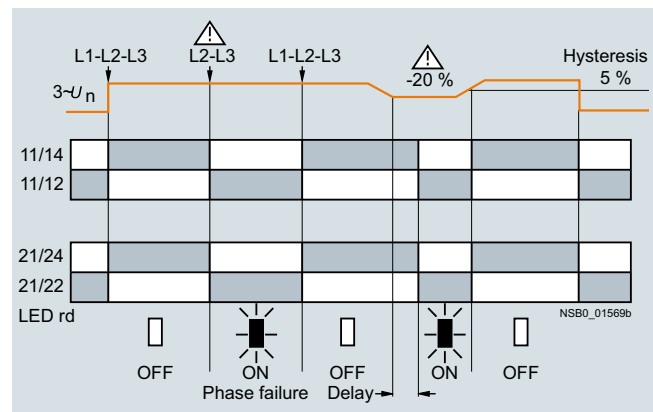
3UG4513 monitoring relays

The 3UG4513 line monitoring relay monitors three-phase networks with regard to phase sequence, phase failure, phase asymmetry and undervoltage of 20%. The device has an internal power supply and works using the closed-circuit principle. The hysteresis is 5%. The integrated response delay time T is adjustable from 0 to 20 s and responds to undervoltage. If the direction is incorrect, the device switches off immediately. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V and feedback through the load of up to 80%. If the line voltage is switched on, the green LED will light up. If the phase sequence at the terminals L1-L2-L3 is correct, the output relay picks up. If the phase sequence is wrong, the red LED flashes and the output relay remains in its rest position. If a phase fails, the red LED is permanently lit and the output relay drops.

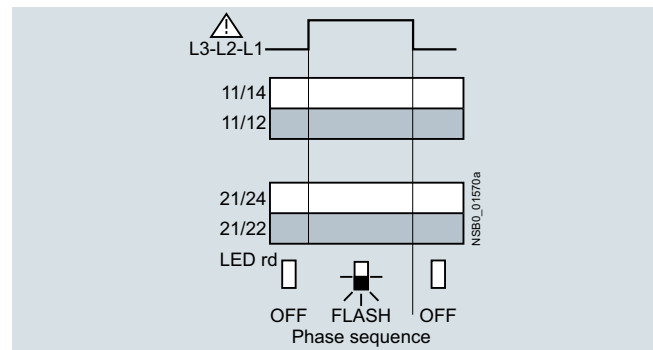
Note:

The red LED is a fault diagnostic indicator and does not show the current relay status. The 3UG4513 monitoring relay is suitable for line frequencies of 50/60 Hz.

Phase failure and undervoltage



Wrong phase sequence



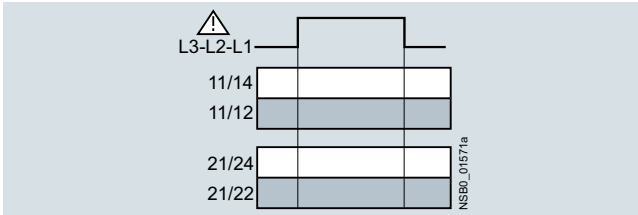
3UG4614 monitoring relays

The 3UG4614 line monitoring relay has a wide voltage range input and an internal power supply. The device is equipped with a display and is parameterized using three buttons. The unit monitors three-phase networks with regard to phase asymmetry from 5 to 20%, phase failure, undervoltage and phase sequence. The hysteresis is adjustable from 1 to 20 V. In addition the device has a response delay and ON-delay from 0 to 20 s in each case. The integrated response delay time responds to phase asymmetry and undervoltage. If the direction is incorrect, the device switches off immediately. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V and feedback through the load of up to 80%.

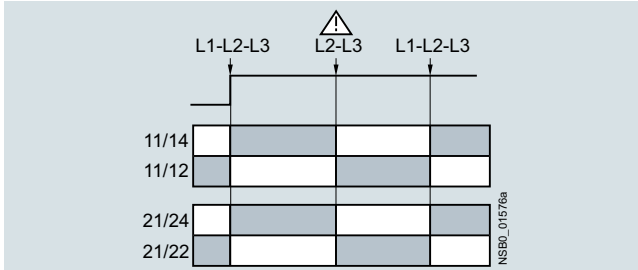
The 3UG4614 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

With the closed-circuit principle selected

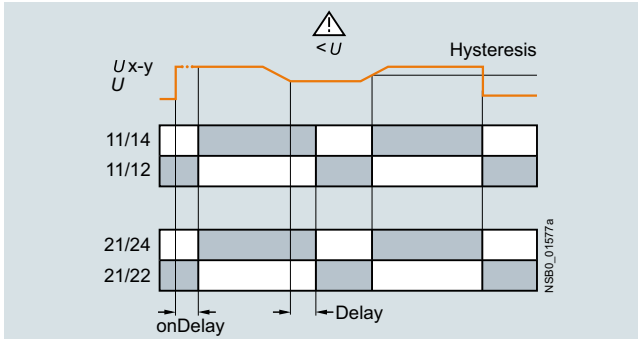
Wrong phase sequence



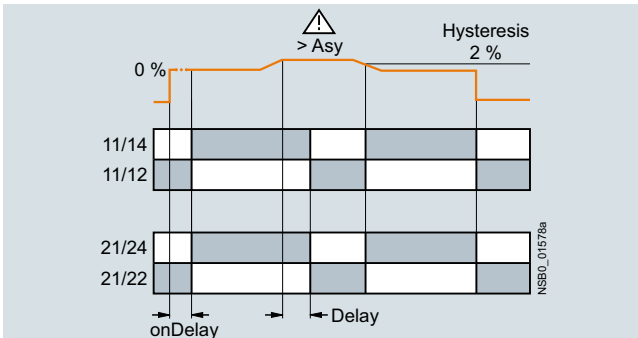
Phase failure



Undervoltage



Unbalance

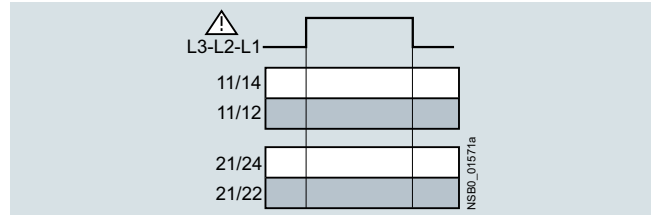
**3UG4615/3UG4616 monitoring relays**

The 3UG4615/3UG4616 line monitoring relay has a wide voltage range input and an internal power supply. The device is equipped with a display and is parameterized using three buttons. The 3UG4615 device monitors three-phase networks with regard to phase failure, undervoltage, overvoltage and phase sequence. The 3UG4616 monitoring relay monitors the neutral conductor as well. The hysteresis is adjustable from 1 to 20 V. In addition the device has two separately adjustable delay times for overvoltage and undervoltage from 0 to 20 s in each case. If the direction of rotation is incorrect, the device switches off immediately. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V and feedback through the load of up to 80%.

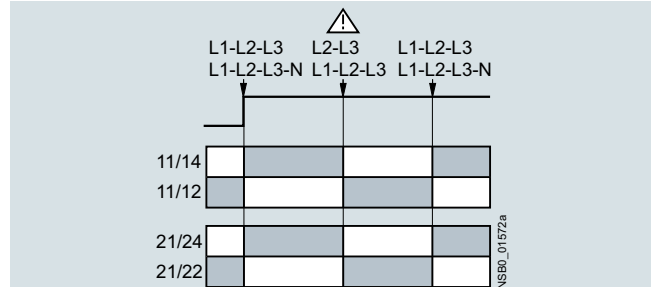
The 3UG4615/3UG4616 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

With the closed-circuit principle selected

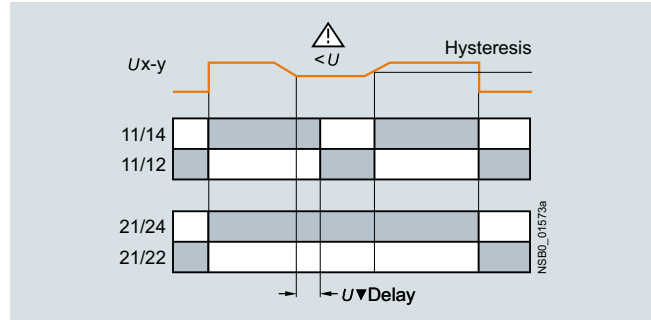
Wrong phase sequence



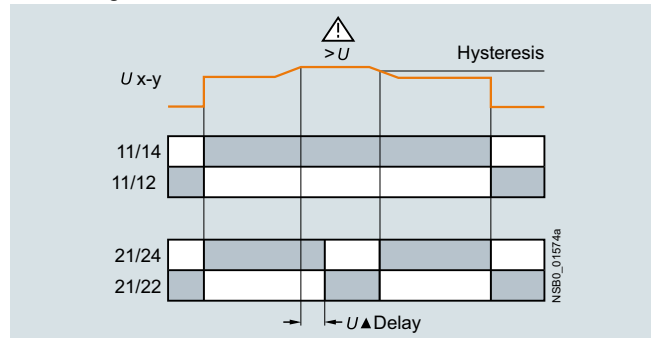
Phase failure



Undervoltage



Overvoltage



Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

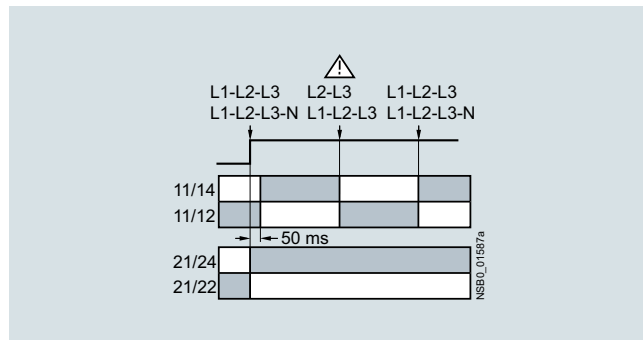
Line monitoring

3UG4617/3UG4618 monitoring relays

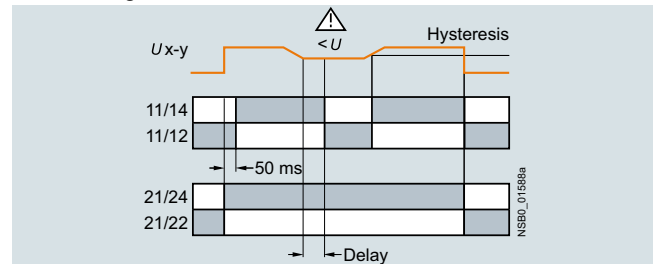
The 3UG4617/3UG4618 line monitoring relay has an internal power supply and can automatically correct a wrong direction of rotation. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V AC and feedback through the load of up to 80%. The device is equipped with a display and is parameterized using three buttons. The 3UG4617 line monitoring relay unit monitors three-phase networks with regard to phase sequence, phase failure, phase unbalance, undervoltage and overvoltage. The 3UG4618 monitoring relay monitors the neutral conductor as well. The hysteresis is adjustable from 1 to 20 V. In addition the device has delay times from 0 to 20 s in each case for overvoltage, undervoltage, phase failure and phase unbalance. The 3UG4617/3UG4618 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET. The one changeover contact is used for warning or disconnection in the event of power system faults (voltage, asymmetry), the other responds only to a wrong phase sequence. In conjunction with a contactor reversing assembly it is thus possible to change the direction automatically.

With the closed-circuit principle selected

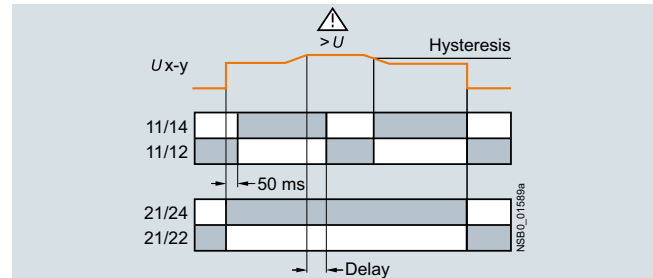
Phase failure



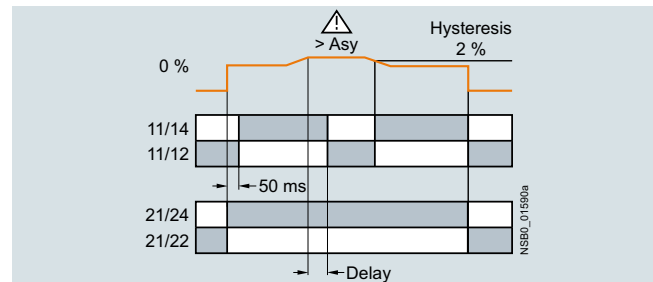
Undervoltage



Overvoltage



Unbalance



Type	3UG4511 ... 3UG4513, 3UG4614 ... 3UG4618	
General data		
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Control circuit		
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	A A A A	3 1 0.2 0.1
Minimum contact load at 17 V DC	mA	5
Electrical endurance AC-15	Million oper- ating cycles	0.1
Mechanical endurance	Million oper- ating cycles	10

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Line monitoring

Selection and ordering data

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H



3UG4511-1AP20



3UG4615-1CR20



3UG4616-1CR20



3UG4617-1CR20



3UG4618-1CR20



3UG4511-2BP20



3UG4512-2BR20

Adjustable hysteresis	Under-voltage detection	Over-voltage detection	Stabilization time adjustable stDEL	Tripping delay time adjustable Del	Version of auxiliary contacts	Measurable line voltage ¹⁾	SD	Screw terminals	SD	Spring-type terminals	
			s	s	CO contact	V	d	Article No.	Price per PU	Article No.	Price per PU

Monitoring of phase sequence

Auto RESET

--	--	--	--	--	1	160 ... 260 AC	2	3UG4511-1AN20	2	3UG4511-2AN20
					2		2	3UG4511-1BN20	2	3UG4511-2BN20
					1	320 ... 500 AC	2	3UG4511-1AP20	2	3UG4511-2AP20
					2		2	3UG4511-1BP20	2	3UG4511-2BP20
					1	420 ... 690 AC	2	3UG4511-1AQ20	5	3UG4511-2AQ20
					2		2	3UG4511-1BQ20	5	3UG4511-2BQ20

Monitoring of phase sequence, phase failure and phase unbalance

Auto RESET, closed-circuit principle, unbalance threshold permanently 10%

--	--	--	--	--	1	160 ... 690 AC	2	3UG4512-1AR20	2	3UG4512-2AR20
					2		2	3UG4512-1BR20	2	3UG4512-2BR20

Monitoring of phase sequence, phase failure, unbalance and undervoltage

Analogically adjustable, Auto RESET, closed-circuit principle, asymmetry and undervoltage threshold permanently 20%

5% of set value	✓	--	--	0.1 ... 20	2	160 ... 690 AC	2	3UG4513-1BR20	2	3UG4513-2BR20
-----------------	---	----	----	------------	---	----------------	---	---------------	---	---------------

Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle, asymmetry threshold 0 or 5 ... 20%

adjustable 1 ... 20 V	✓	--	0.1 ... 20	0.1 ... 20	2	160 ... 690 AC	2	3UG4614-1BR20	2	3UG4614-2BR20
-----------------------	---	----	------------	------------	---	----------------	---	---------------	---	---------------

Monitoring of phase sequence, phase failure, overvoltage and undervoltage

Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle

adjustable 1 ... 20 V	✓	✓	--	0.1 ... 20 ²⁾	2 ²⁾	160 ... 690 AC	2	3UG4615-1CR20	2	3UG4615-2CR20
-----------------------	---	---	----	--------------------------	-----------------	----------------	---	---------------	---	---------------

Monitoring of phase sequence, phase and N conductor failure, overvoltage and undervoltage

Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle

adjustable 1 ... 20 V	✓	✓	--	0.1 ... 20 ²⁾	2 ²⁾	90 ... 400 AC against N	2	3UG4616-1CR20	2	3UG4616-2CR20
-----------------------	---	---	----	--------------------------	-----------------	-------------------------	---	---------------	---	---------------

Automatic correction of the direction of rotation in case of wrong phase sequence, phase failure, unbalance, overvoltage and undervoltage

Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle, asymmetry threshold 0 or 5 ... 20%

adjustable 1 ... 20 V	✓	✓	--	0.1 ... 20	2 ³⁾	160 ... 690 AC	2	3UG4617-1CR20	2	3UG4617-2CR20
-----------------------	---	---	----	------------	-----------------	----------------	---	---------------	---	---------------

Automatic correction of the direction of rotation in case of wrong phase sequence, phase and N conductor failure, phase unbalance, overvoltage and undervoltage

Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle, asymmetry threshold 0 or 5 ... 20%

adjustable 1 ... 20 V	✓	✓	--	0.1 ... 20	2 ³⁾	90 ... 400 AC against N	2	3UG4618-1CR20	2	3UG4618-2CR20
-----------------------	---	---	----	------------	-----------------	-------------------------	---	---------------	---	---------------

- ✓ Function available
 -- Function not available

For accessories, see page 10/108.

1) Absolute limit values.

2) 1 CO contact each and one tripping delay time each for U_{\min} and U_{\max} .

3) 1 CO contact each for power system fault and phase sequence correction.

Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Voltage monitoring

Overview



SIRIUS 3UG4631 monitoring relay

The relays monitor single-phase AC voltages (rms value) and DC voltages against the set threshold value for overshoot and undershoot. The devices differ with regard to their power supply (internal or external).

Benefits

- Versions with wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display of ACTUAL value and status messages
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

- Protection of a plant against destruction due to overvoltage
- Switch-on of a plant at a defined voltage and higher
- Protection from undervoltage due to overloaded control supply voltages, particularly with battery power
- Threshold switch for analog signals from 0.1 to 10 V

Technical specifications

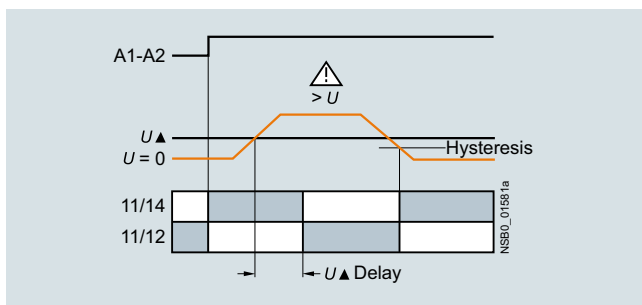
3UG4631/3UG4632 monitoring relays

The 3UG4631/3UG4632 voltage monitoring relay is supplied with an auxiliary voltage of 24 V AC/DC or 24 to 240 V AC/DC and performs overshoot, undershoot or range monitoring of the voltage depending on parameterization. The device is equipped with a display and is parameterized using three buttons.

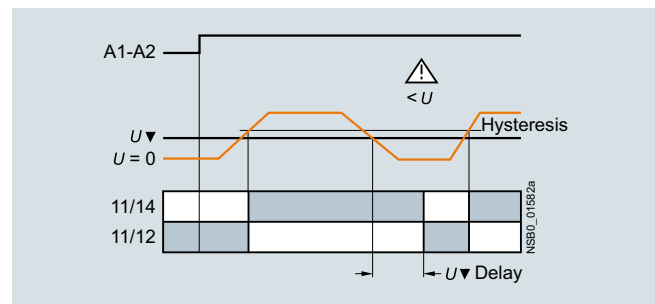
The measuring range extends from 0.1 to 60 V or 10 to 600 V AC/DC. The threshold values for overshoot or undershoot can be freely configured within this range. If one of these threshold values is reached, the output relay responds according to the set principle of operation as soon as the delay time has elapsed. This delay time U_{Del} can be set from 0.1 to 20 s. The hysteresis can be set from 0.1 to 30 V or 0.1 to 300 V. The device can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET. One output changeover contact is available as signaling contact.

With the closed-circuit principle selected

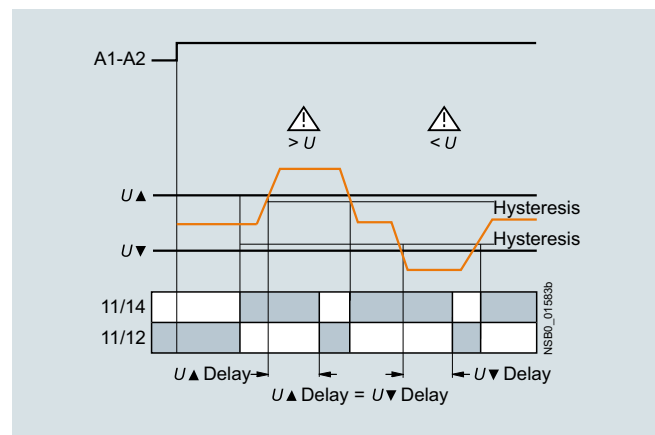
Overvoltage



Undervoltage



Range monitoring



3UG4633 monitoring relay

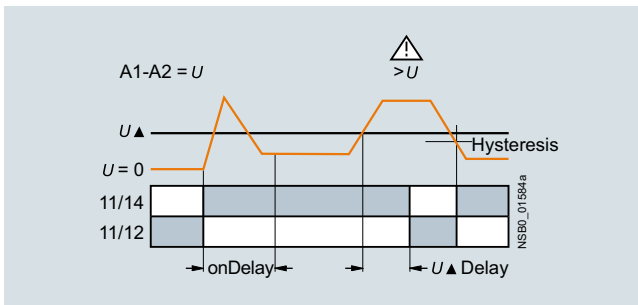
The 3UG4633 voltage monitoring relay has an internal power supply and performs overshoot, undershoot or range monitoring of the voltage depending on parameterization. The device is equipped with a display and is parameterized using three buttons.

The operating and measuring range extends from 17 to 275 V AC/DC. The threshold values for overshoot or undershoot can be freely configured within this range. If one of these threshold values is reached, the output relay responds according to the set principle of operation as soon as the tripping delay time has elapsed. This delay time U_{Del} can also be adjusted, just like the ON-delay time on_{Del} , from 0.1 to 20 s.

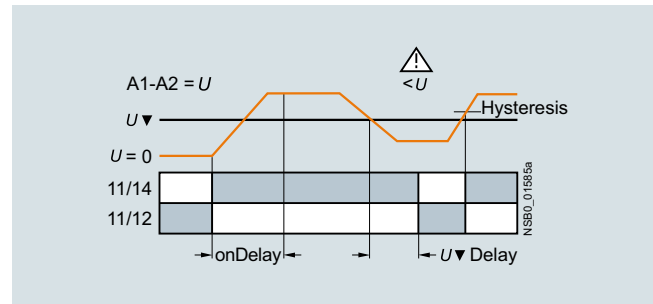
The hysteresis is adjustable from 0.1 to 150 V. The device can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET. One output changeover contact is available as signaling contact.

With the closed-circuit principle selected

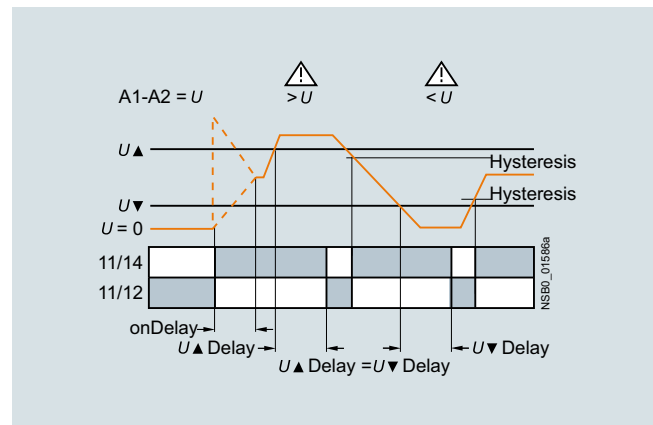
Overvoltage



Undervoltage



Range monitoring



Type		3UG4631	3UG4632	3UG4633			
General data							
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690					
Rated impulse withstand voltage U_{imp}	kV				6		
Measuring circuit							
Permissible measuring range single-phase AC/DC voltage	V	0.1 ... 68	10 ... 650	17 ... 275			
Measuring frequency	Hz	40 ... 500					
Setting range single-phase voltage	V	0.1 ... 60	10 ... 600	17 ... 275			
Control circuit							
Load capacity of the output relay • Thermal current I_{th}	A	5					
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	A A A A				3 1 0.2 0.1		
Minimum contact load at 17 V DC	mA				5		

Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Voltage monitoring

Selection and ordering data

- Digitally adjustable, with illuminated LCD
- Auto or Manual RESET
- Open- or closed-circuit principle
- 1 CO contact

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H



3UG4631-1AA30



3UG4633-2AL30

Measuring range	Adjustable hysteresis	Rated control supply voltage U_s	SD	Screw terminals	SD	Spring-type terminals
V	V	V	d	Article No.	Price per PU	Article No.
Internal power supply without auxiliary voltage, separately adjustable ON-delay and tripping delay 0.1 ... 20 s						
17 ... 275 AC/DC	0.1 ... 150	17 ... 275 AC/DC ¹⁾	2	3UG4633-1AL30	2	3UG4633-2AL30
Externally supplied with auxiliary voltage, tripping delay adjustable 0.1 ... 20 s						
0.1 ... 60 AC/DC	0.1 ... 30	24 AC/DC	2	3UG4631-1AA30	2	3UG4631-2AA30
10 ... 600 AC/DC	0.1 ... 300		2	3UG4632-1AA30	2	3UG4632-2AA30
0.1 ... 60 AC/DC	0.1 ... 30	24 ... 240 AC/DC	2	3UG4631-1AW30	2	3UG4631-2AW30
10 ... 600 AC/DC	0.1 ... 300		2	3UG4632-1AW30	2	3UG4632-2AW30

¹⁾ Absolute limit values.

For accessories, see page 10/108.

Overview



SIRIUS 3UG4622 monitoring relay

The relays monitor single-phase AC currents (rms value) and DC currents against the set threshold value for overshoot and undershoot. They differ with regard to their measuring ranges and control supply voltage types.

Benefits

- Versions with wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display of ACTUAL value and status messages
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

- Overcurrent and undercurrent monitoring
- Monitoring the functionality of electrical loads
- Open-circuit monitoring
- Threshold switch for analog signals from 4 to 20 mA

Technical specifications

3UG4621/3UG4622 monitoring relays

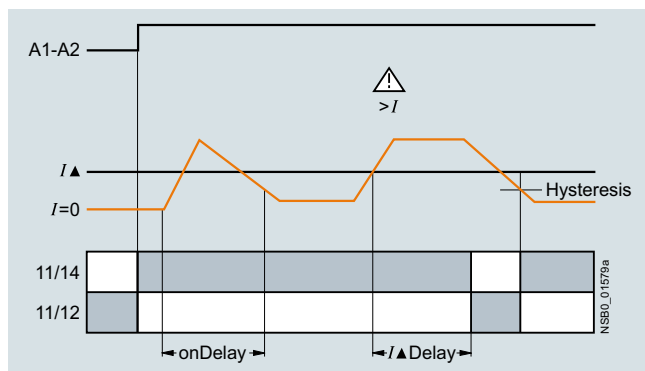
The 3UG4621 or 3UG4622 current monitoring relay is supplied with an auxiliary voltage of 24 V AC/DC or 24 to 240 V AC/DC and performs overshoot, undershoot or range monitoring of the current depending on parameterization. The device is equipped with a display and is parameterized using three buttons.

The measuring range extends from 3 to 500 mA or 0.05 to 10 A. The rms value of the current is measured. The threshold values for overshoot or undershoot can be freely configured within this range. If one of these threshold values is reached, the output relay responds according to the set principle of operation as soon as the tripping delay time I_{Del} has elapsed. This time and the ON-delay time on_{Del} are adjustable from 0.1 to 20 s.

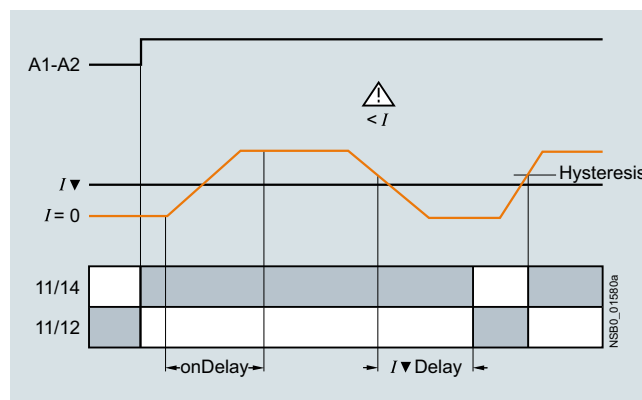
The hysteresis is adjustable from 0.1 to 250 mA or 0.01 to 5 A. The device can be operated with Manual or Auto RESET and on the basis of either the open-circuit or closed-circuit principle. You can decide here whether the output relay is to respond when the supply voltage $U_s = ON$ is applied, or not until the lower measuring range limit of the measuring current ($I > 3 \text{ mA}/50 \text{ mA}$) is reached. One output changeover contact is available as signaling contact.

With the closed-circuit principle selected upon application of the control supply voltage

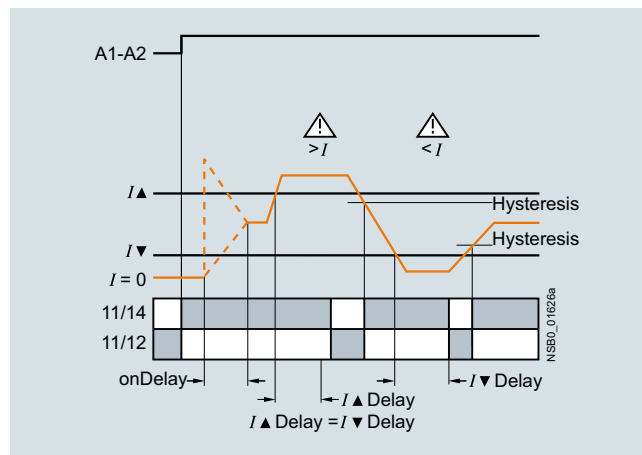
Current overshoot



Current undershoot



Range monitoring



Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Current monitoring

Type		3UG4621-AA	3UG4621-AW	3UG4622-AA	3UG4622-AW
General data					
Rated insulation voltage U_i Pollution degree 3; overvoltage category III according to VDE 0110	V	690			
Rated impulse withstand voltage U_{imp}	kV	6			
Measuring circuit					
Measuring range for single-phase AC/DC current	A	0.003 ... 0.6		0.05 ... 15	
Measuring frequency	Hz	40 ... 500			
Setting range for single-phase current	A	0.003 ... 0.5		0.05 ... 10	
Load supply voltage	V	24	Max. 300 ¹⁾ Max. 500 ²⁾	24	Max. 300 ¹⁾ Max. 500 ²⁾
Control circuit					
Load capacity of the output relay • Thermal current I_{th}	A	5			
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	A A A A	3 1 0.2 0.1			
Minimum contact load at 17 V DC	mA	5			

¹⁾ With protective separation.

²⁾ With simple separation.

Selection and ordering data

- Digitally adjustable, with illuminated LCD
- Auto or Manual RESET
- Open- or closed-circuit principle
- 1 CO contact

PU (UNIT, SET, M) = 1
PS* = 1 unit
PG = 41H



3UG4621-1AA30



3UG4622-2AW30

Measuring range	Adjustable hysteresis	Rated control supply voltage U_s	SD	Screw terminals		SD	Spring-type terminals	
		V	d	Article No.	Price per PU	d	Article No.	Price per PU
Monitoring of undercurrent and overcurrent, start up delay and tripping delay times can be adjusted separately 0.1 ... 20 s								
3 ... 500 mA AC/DC 0.05 ... 10 A AC/DC	0.1 ... 250 mA 0.01 ... 5 A	24 AC/DC ¹⁾	2 2	3UG4621-1AA30 3UG4622-1AA30		2 2	3UG4621-2AA30 3UG4622-2AA30	
3 ... 500 mA AC/DC 0.05 ... 10 A AC/DC	0.1 ... 250 mA 0.01 ... 5 A	24 ... 240 AC/DC ²⁾	2 2	3UG4621-1AW30 3UG4622-1AW30		2 2	3UG4621-2AW30 3UG4622-2AW30	

¹⁾ No electrical separation. Load supply voltage 24 V.

²⁾ Electrical separation between control circuit and measuring circuit.
Load supply voltage for protective separation max. 300 V, for simple separation max. 500 V.

For accessories, see page 10/108.

For AC currents $I > 10$ A it is possible to use 4NC current transformers as an accessory, see Catalog LV 10.

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Power factor and active current monitoring

Overview



SIRIUS 3UG4641 monitoring relay

The 3UG4641 power factor and active current monitoring device enables the load monitoring of motors.

Whereas power factor (p.f.) monitoring is used above all for monitoring no-load operation, the active current monitoring option can be used to observe and evaluate the load factor over the entire torque range.

Technical specifications

3UG4641 monitoring relay

The 3UG4641 monitoring relay is self-powered and serves the single-phase monitoring of the power factor or performs overshoot, undershoot or range monitoring of the active current depending on how it is parameterized. The load to be monitored is connected upstream of the IN terminal. The load current flows through the terminals IN and Ly/N. The setting range for the power factor is 0.1 to 0.99 and for the active current I_{res} it is 0.2 to 10 A. If the control supply voltage is switched on and no load current flows, the display will show $I < 0.2$ and a symbol for overrange, underrange or range monitoring. If the motor is now switched on and the current exceeds 0.2 A, the set ON-delay time begins. During this time, if the set limit values are undershot or exceeded, this does not lead to a relay reaction of the changeover contact. If the operational flowing active current and/or the power factor value falls below or exceeds the respective set threshold value, the spike delay begins. When this time has expired, the relay changes its switch position. The relevant measured variables for overshooting and undershooting in the display flash. If monitoring for active current undershoot is switched off ($I_{res} \nabla = \text{OFF}$), and if the load current undershoots the lower measuring range threshold (0.2 A), the CO contacts remain unchanged. If a threshold value is set for the monitoring of active current undershooting, then undershooting of the measuring range threshold (0.2 A) will result in a response of the CO contacts.

The relay operates either according to the open-circuit or closed-circuit principle. If the device is set to Auto RESET (Memory = No), depending on the set principle of operation, the switching relay returns to its initial state and the flashing ends when the hysteresis threshold is reached.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continue to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for 2 seconds, or by switching the supply voltage off and back on again.

Benefits

- Can be used worldwide thanks to wide voltage range from 90 to 690 V (absolute limit values)
- Monitoring of even small single-phase motors with a no-load supply current below 0.5 A
- Simple determination of threshold values by the direct collection of measured variables on motor loading
- Range monitoring and active current measurement enable detection of cable breaks between control cabinets and motors, as well as phase failures
- Power factor (p.f.) or I_{res} (active current) can be selected as the measurement principle
- Width 22.5 mm
- All versions with removable terminals

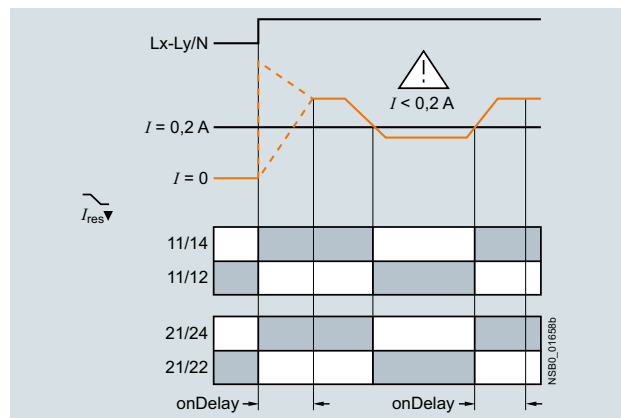
Application

- No-load monitoring and load shedding, such as in the event of a V-belt tear
- Underload monitoring in the low-end performance range, e.g. in the event of pump no-load operation
- Monitoring of overload, e.g. due to a dirty filter system
- Simple power factor monitoring in power systems for control of compensation equipment
- Broken cable between control cabinet and motor

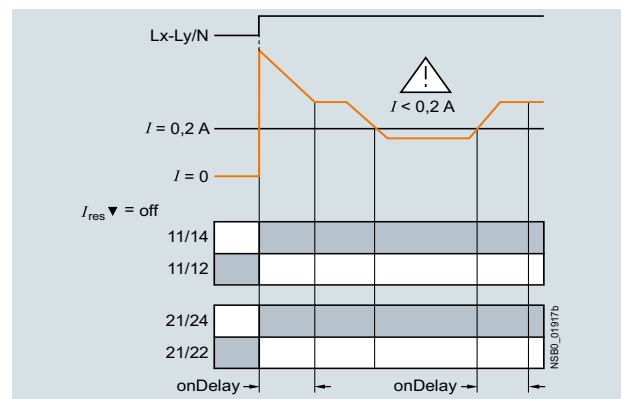
With the closed-circuit principle selected

Response in the event of undershooting the measuring range limit

- With activated monitoring of $I_{res} \nabla$



- With deactivated monitoring of active current undershooting

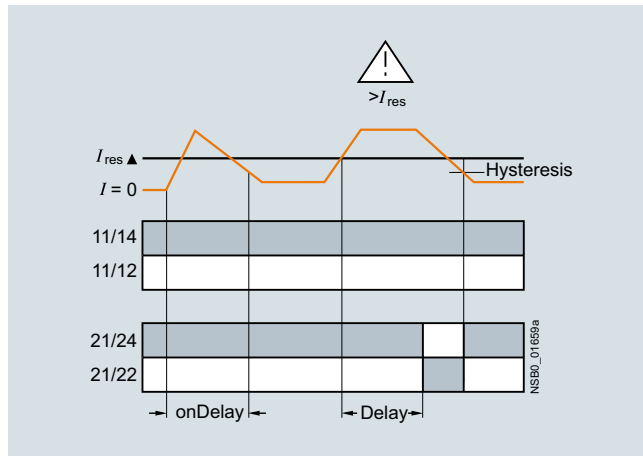


Relays

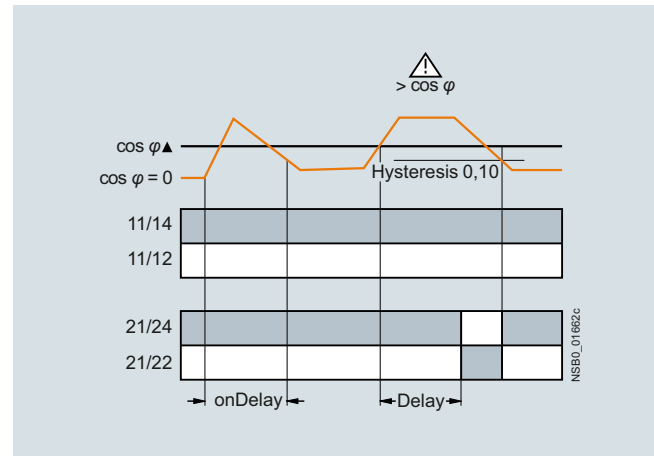
SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Power factor and active current monitoring

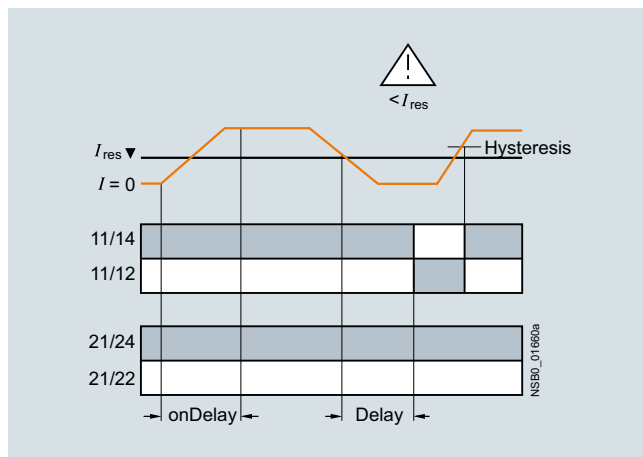
Overshooting of active current



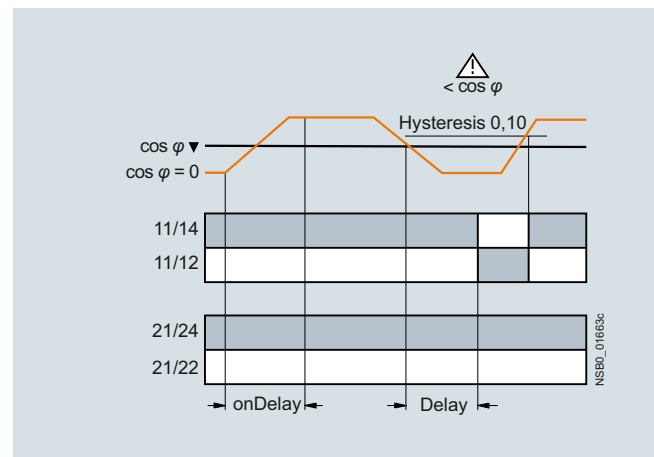
Overshooting of power factor



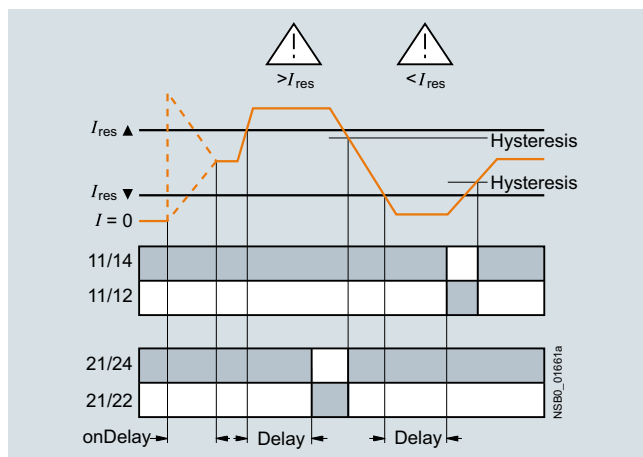
Undershooting of active current



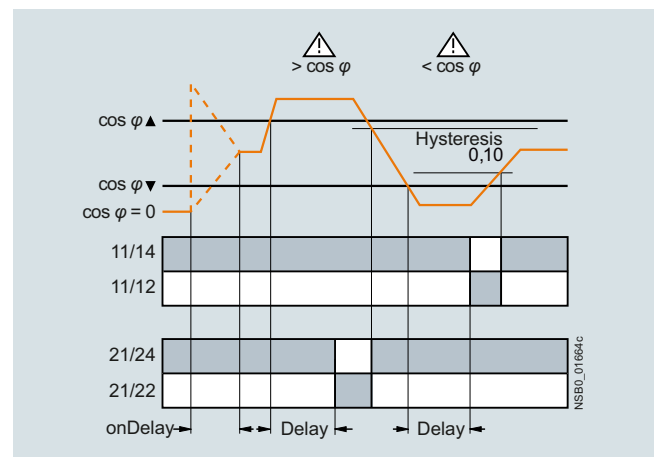
Undershooting of power factor



Range monitoring of active current



Range monitoring of power factor



SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation



Power factor and active current monitoring

Type	3UG4641	
General data		
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Control circuit		
Number of CO contacts for auxiliary contacts		2
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13/24 V • DC-13/125 V • DC-13/250 V	A A A A	3 1 0.2 0.1
Minimum contact load at 17 V DC	mA	5

Selection and ordering data

- For monitoring the power factor and the active current I_{res} (p.f. $\times I$)
- Suitable for single- and three-phase currents
- Digitally adjustable, with illuminated LCD
- Overshoot, undershoot or range monitoring adjustable
- Upper and lower threshold value can be adjusted separately
- Permanent display of actual value and tripping state
- 1 changeover contact each for undershoot/overshoot

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H

Measuring range		Adjustable hysteresis		ON-delay time adjustable onDel	Tripping delay time adjustable $I \Delta Del / I \nabla Del, \varphi \Delta Del / \varphi \nabla Del$	Rated control supply voltage U_s ¹⁾ 50/60 Hz AC	SD	Screw terminals 	SD	Spring-type terminals 
For power factor	For active current I_{res}	For power factor	For active current I_{res}							
P.f.	A	P.f.	A	s	s	V	d	Article No.	Price per PU	d
0.10 ... 0.99	0.2 ... 10.0	0.1	0.1 ... 2.0	0 ... 99	0.1 ... 20.0	90 ... 690	2	3UG4641-1CS20		3UG4641-2CS20

¹⁾ Absolute limit values.

For accessories, see [page 10/108](#).

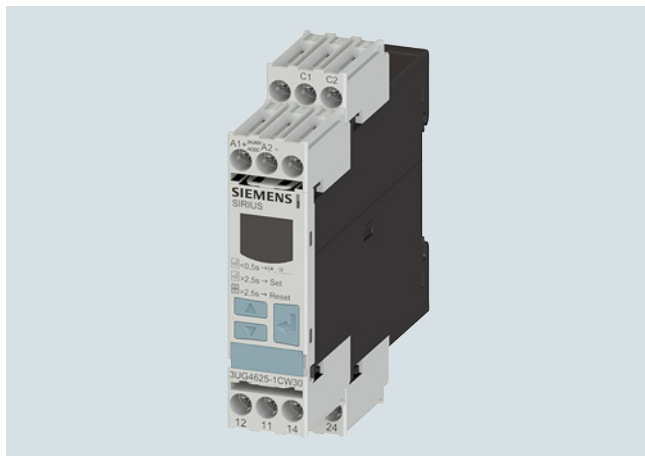
For AC active currents $I_{res} > 10$ A it is possible to use 4NC current transformers as an accessory, see [Catalog LV 10](#).

Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Residual-Current Monitoring

Residual-current monitoring relays

Overview



SIRIUS 3UG4625 monitoring relay

The 3UG4625 residual-current monitoring relays are used in conjunction with the 3UL23 residual-current transformers for monitoring plants in which higher residual currents are increasingly expected due to ambient conditions. Monitoring encompasses pure AC residual currents or AC residual currents with a pulsating DC fault current component (transformer type A in accordance with DIN VDE 0100-530/IEC TR 60755).

Benefits

- Worldwide use thanks to wide voltage range from 24 to 240 V AC/DC
- High measuring accuracy of $\pm 7.5\%$
- Permanent self-monitoring
- Variable threshold values for warning and disconnection
- Freely configurable delay times and RESET response
- Permanent display of the actual value and fault diagnostics via the display
- High level of flexibility and space saving through installation of the transformer inside or outside the control cabinet
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

Monitoring of plants in which residual currents can occur, e.g. due to dust deposits or moisture, porous cables and leads, or capacitive residual currents.

Technical specifications

3UG4625 monitoring relays

The main conductor, and any neutral conductor to which a load is connected, are routed through the opening of the annular ring core of a residual-current transformer. A secondary winding is placed around this annular ring core to which the monitoring relay is connected.

If operation of a plant is fault-free, the sum of the inflowing and outward currents equals zero. No current is then induced in the secondary winding of the residual-current transformer.

However, if an insulation fault occurs downstream of the residual-current-operated circuit breaker, the sum of the inflowing currents is greater than that of the outward currents. The differential current – i.e. the residual current – induces a secondary current in the secondary winding of the transformer. This current is evaluated in the monitoring relay and is used on the one hand to display the actual residual current and on the other, to switch the relay if the set warning or tripping threshold is overshot.

If the measured residual current exceeds the set warning value, the associated changeover contact instantly changes the switching state and an indication appears on the display.

If the measured residual current exceeds the set tripping value, the set delay time begins and the associated relay symbol flashes. On expiry of this time, the associated changeover contact changes the switching state.

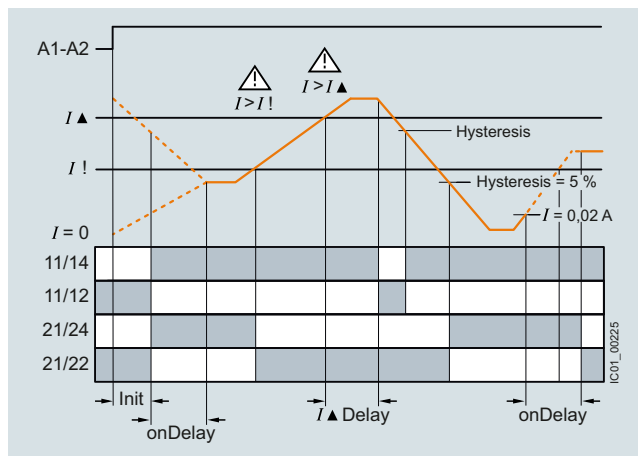
ON-delay time for motor start

To be able to start a drive when a residual current is detected, the output relays switch to the OK state for an adjustable ON-delay time depending on the selected open-circuit principle or closed-circuit principle.

The changeover contacts do not react if the set threshold values are overshot during this period.

With the closed-circuit principle selected

Residual-current monitoring with Auto RESET (Memory = no)



If the device is set to Auto RESET, the relay switches back to the OK state for the tripping value once the value falls below the set hysteresis threshold and the display stops flashing.

The associated relay changes its switching state if the value falls below the fixed hysteresis value of 5% of the set warning value.

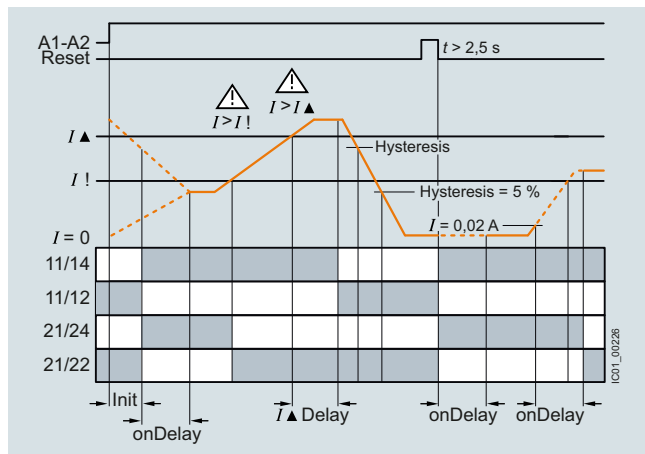
Any overshoots are therefore not stored.

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Residual-Current Monitoring

Residual-current monitoring relays

Residual-current monitoring with Manual RESET (Memory = yes)



If Manual RESET is selected in the menu, the output relays remain in their current switching state and the current measured value and the symbol for overshooting continue to flash, even when the measured residual current returns to a permissible value. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for > 2 seconds, or by switching the supply voltage off and back on again.

Note:

Do not ground the neutral conductor downstream of the residual-current transformer as otherwise residual-current monitoring functions can no longer be ensured.

Type	3UG4625-1CW30, 3UG4625-2CW30	
General data		
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3, rated value	V	300
Impulse withstand voltage, rated value U_{imp}	kV	4
Control circuit		
Number of CO contacts for auxiliary contacts		2
Thermal current of the non-solid-state contact blocks, maximum	A	5
Current carrying capacity of the output relay		
• At AC-15 at 250 V at 50/60 Hz	A	3
• At DC-13		
- At 24 V	A	1
- At 125 V	A	0.2
- At 250 V	A	0.1
Operational current at 17 V, minimum	mA	5

Selection and ordering data

- For monitoring residual currents from 0.03 to 40 A, from 16 to 400 Hz
- For 3UL23 residual-current transformers with feed-through opening from 35 to 210 mm
- Permanent self-monitoring
- Certified in accordance with IEC 60947, functionality corresponds to IEC 62020
- Digitally adjustable, with illuminated LCD

- Permanent display of actual value and tripping state
- Separately adjustable limit value and warning threshold
- 1 changeover contact each for warning threshold and tripping threshold

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H



3UG4625-1CW30



3UG4625-2CW30

Measur-able current	Adjustable response value current	Switching hysteresis	Adjustable ON-delay time	Control supply voltage			SD	Screw terminals		SD	Spring-type terminals	
A	A	%	s	For AC at 50 Hz rated value	For AC at 60 Hz rated value	At DC rated value	d	Article No.	Price per PU	d	Article No.	Price per PU
0.01 ... 43	0.03 ... 40	0 ... 50	0 ... 20	24 ... 240	24 ... 240	24 ... 240	2	3UG4625-1CW30		2	3UG4625-2CW30	

For accessories, see page 10/108.

For the 3UL23 residual-current transformers, see page 10/94.

Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Residual-Current Monitoring

3UL23 residual-current transformers

Overview



SIRIUS 3UL23 residual-current transformer

The 3UL23 residual-current transformers detect residual currents in machines and plants. They are suitable for pure AC residual currents or AC residual currents with a pulsating DC fault current component (transformer type A in accordance with DIN VDE 0100-530/IEC TR 60755).

Together with the 3UG4625, 3UG4825 residual-current monitoring relays for IO-Link or the SIMOCODE 3UF motor management and control device they enable residual-current and ground-fault monitoring.

The 3UL2302-1A and 3UL2303-1A residual-current transformers with a feed-through opening from 35 to 55 mm can be mounted in conjunction with the 3UL2900 accessories on a TH 35 standard mounting rail according to IEC 60715.

Selection and ordering data

Diameter of the bushing opening	Connectable cross-section of the connecting terminal	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
mm	mm ²	d	Article No.	Price per PU		
Residual-current transformers (essential accessories for 3UG4625, 3UG4825)						
35	2.5	2	3UL2302-1A	1	1 unit	41H
55	2.5	2	3UL2303-1A	1	1 unit	41H
80	2.5	2	3UL2304-1A	1	1 unit	41H
110	2.5	2	3UL2305-1A	1	1 unit	41H
140	2.5	2	3UL2306-1A	1	1 unit	41H
210	4	2	3UL2307-1A	1	1 unit	41H

Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					

Adapters



3UL2900

Adapters

For mounting onto standard rail
for 3UL23 to diameter 55 mm

2	3UL2900	1	2 units	41H
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SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Insulation Monitoring

General data

Overview



SIRIUS 3UG458. insulation monitor

Insulation monitoring relays are used for monitoring the insulation resistance between ungrounded single- or three-phase AC 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. IT systems are supplied via an isolating transformer or by power supply sources such as batteries or a generator. While an initial insulation fault between a phase conductor and the ground effectively grounds the conductor, as a result no circuit has been closed, so it is possible to continue work in safety (single-fault safety). However, the fault must 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 so that either a controlled shutdown can be performed or the fault can be rectified without interrupting the power supply.

Two device series

- 3UG4581 insulation monitoring relays for ungrounded AC networks
- 3UG4582 and 3UG4583 insulation monitoring relays for ungrounded DC and AC networks

Benefits

- Devices for AC and DC systems
- All devices have a wide control supply voltage range
- Direct connection to networks with mains voltages of up to 690 V AC and 1 000 V DC by means of a voltage reducer module
- For AC supply systems: Frequency range 15 to 400 Hz
- Monitoring of broken conductors
- Monitoring of setting errors
- Safety in use thanks to integrated system test after startup
- Option of resetting and testing (by means of button on front or using control contact)
- New predictive measurement principle allows very fast response times

Application

IT networks are used, for example:

- In emergency power supplies
- In safety lighting systems
- In industrial production facilities with high availability requirements (chemical industry, automobile manufacturing, printing plants)
- In shipping and railways
- For mobile generators (aircraft)
- For renewable energies, such as wind energy and photovoltaic power plants
- In the mining industry

Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Insulation Monitoring

General data

Technical specifications

More information

For manuals, see

- <https://support.industry.siemens.com/cs/ww/en/view/54382552>
- <https://support.industry.siemens.com/cs/ww/en/view/54382528>

Type	3UG4581-1AW30	3UG4582-1AW30	3UG4583-1CW30
General data			
Setting range for the setpoint response values			
• 1 ... 100 kΩ	✓	✓	✓
• 2 ... 200 kΩ	--	--	✓
Rated voltage of the network being monitored			
• 0 ... 250 V AC	--	✓	--
• 0 ... 440 V AC	✓	--	✓
• 0 ... 690 V AC	--	--	✓ ¹⁾
• 0 ... 300 V DC	--	✓	--
• 0 ... 600 V DC	--	--	✓ ¹⁾
• 0 ... 1 000 V DC	--	--	✓ ¹⁾
Max. leakage capacitance of the system			
• 10 μF	✓	✓	--
• 20 μF	--	--	✓
Output contacts			
• 1 CO	✓	✓	--
• 2 CO or 1 CO + 1 CO, adjustable	--	--	✓
Number of limit values			
• 1	✓	✓	--
• 1 or 2, adjustable	--	--	✓
Principle of operation	Closed-circuit principle	Closed-circuit principle	Open-circuit/closed-circuit principle, adjustable
Rated control supply voltage			
• 24 ... 240 V AC/DC	✓	✓	✓
Rated frequency			
• 15 ... 400 Hz	--	✓	✓
• 50/60 Hz	✓	--	--
Auto or Manual RESET	✓ Adjustable	✓ Adjustable	✓ Adjustable
Remote RESET	✓ Via control input	✓ Via control input	✓ Via control input
Non-volatile error memory	--	--	✓ Adjustable
Broken wire detection	--	--	✓ Adjustable
Replacement for			
Rated control supply voltage U_s	Voltage range of the network being monitored		
3UG3081-1AK20 110 ... 130/220 ... 240 V AC/DC	3 x 230/400 V AC	✓	--
3UG3081-1AW30 24 ... 240 V AC/DC	3 x 230/400 V AC	✓	--
3UG3082-1AW30 24 ... 240 V AC/DC	24 ... 240 V DC	--	✓

✓ Available

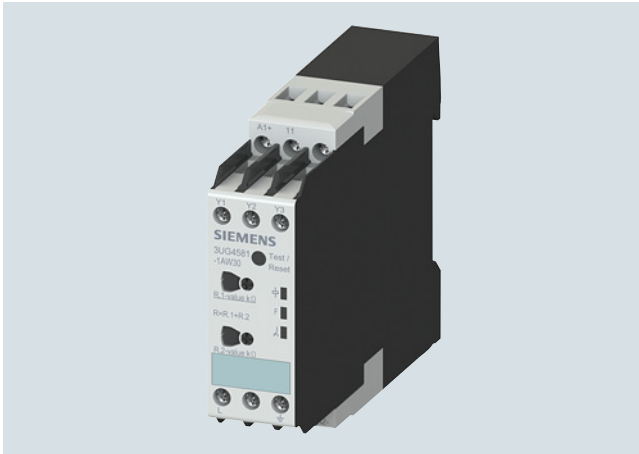
-- Not available

¹⁾ With voltage reducer module.

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Insulation Monitoring

For ungrounded AC networks

Overview



SIRIUS 3UG4581 insulation monitor

The 3UG4581 insulation monitoring relays are used to monitor insulation resistance according to IEC 61557-8 in ungrounded AC networks with rated voltages of up to 400 V.

These devices can monitor control circuits (single-phase) and main circuits (three-phase).

They measure insulation resistances between system cables and system ground. If the value falls below the threshold value, the output relays are switched to fault status.

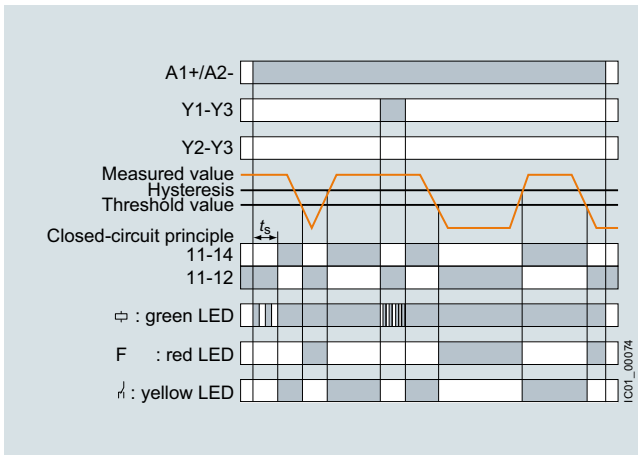
In the case of 3UG4581 a higher-level DC measuring signal is used. The higher-level DC measuring signal and the resulting current are used to determine the value of the insulation resistance of the network which is to be measured.

Technical specifications

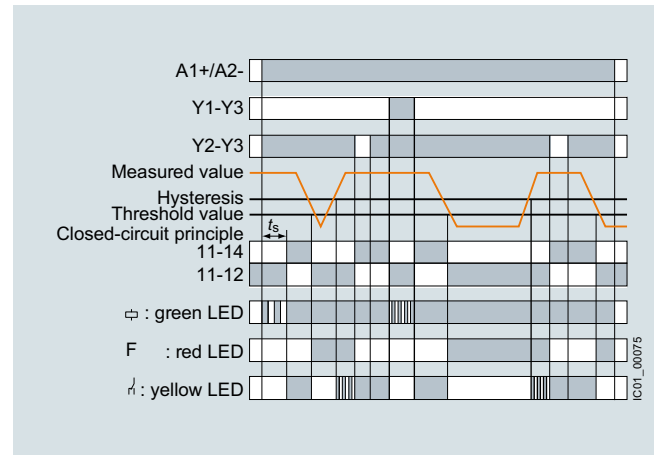
3UG4581 monitoring relay

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with Auto RESET



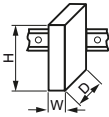
Insulation resistance monitoring with fault storage and Manual RESET



Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Insulation Monitoring

For ungrounded AC networks

Type	3UG4581	
Dimensions (W x H x D)	mm	22.5 x 100 x 100
	Connection type	
	Screw terminals	
	mm ²	2 x (0.5 ... 4)
	mm ²	2 x (0.75 ... 2.5)
<ul style="list-style-type: none"> • Solid • Finely stranded with end sleeve • AWG cables, solid or stranded 	mm ²	2 x (0.5 ... 4)
	mm ²	2 x (0.75 ... 2.5)
	AWG	2 x (20 ... 14)
	AWG	2 x (20 ... 14)
General data		
Rated insulation voltage U_i	V	400 supply circuit/measuring circuit
Pollution degree 3		300 supply circuit/output circuit
Overvoltage category III acc. to IEC 60664		
Rated impulse withstand voltage U_{imp}	kV	6
Rated control supply voltage	V	24 ... 240 AC/DC
Rated frequency	Hz	15 ... 400
Measuring circuit		
Rated line voltage of the network being monitored	V	0 ... 400
Rated frequency of the network being monitored	Hz	50 ... 60
Setting range for insulation resistance	kΩ	1 ... 100
Control circuit		
Load capacity of the output relay		
• Thermal current I_{th}	A	4
Rated operational current I_e at		
• AC-15/24 ... 400 V	A	3
• DC-13/24 V	A	2
Minimum contact load at 24 V DC	mA	10

Selection and ordering data

- Auto or Manual RESET
- Closed-circuit principle
- 1 CO contact
- Fault memory adjustable using control input (Y2-Y3)
- Reset by means of button on front or using control input (Y2-Y3)
- Test by means of button on front or using control input (Y1-Y3)

Rated line voltage U_n	Measuring range U_e	Rated control supply voltage U_s	System leakage capacitance	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
V AC	kΩ	V	μF	d	Article No.	Price per PU		

Insulation monitors for ungrounded AC networks

0 ... 400	1 ... 100	24 ... 240 AC/DC	Max. 10	5	3UG4581-1AW30	1	1 unit	41H
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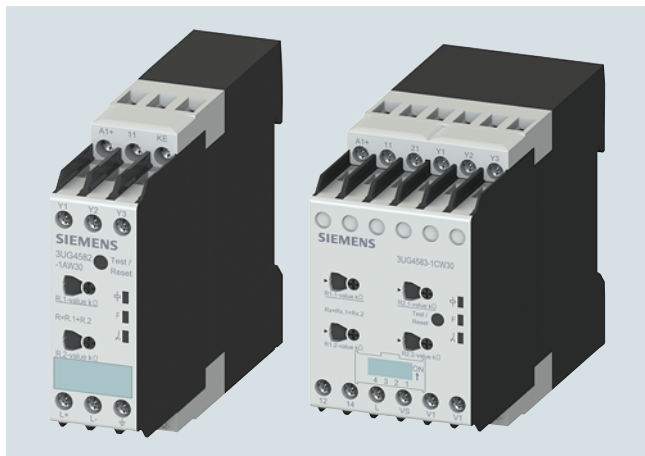
3UG4581-1AW30

For accessories, see page 10/108.

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Insulation Monitoring

For ungrounded DC and AC networks

Overview



SIRIUS 3UG4582 and 3UG4583 insulation monitors

The 3UG4582 and 3UG4583 insulation monitoring relays are used to monitor insulation resistance in ungrounded IT AC or DC networks according to IEC 61557-8.

They measure insulation resistances between system cables and system ground. If the value falls below the threshold value, the output relays are switched to fault status. With these devices, which are suitable for both AC and DC networks, a pulsed test signal is fed into the network to be monitored and the isolation resistance is determined.

The pulsed test signal changes its form according to insulation resistance and network loss capacitance. The changed form is used to predict the changed insulation resistance.

If the predicted insulation resistance matches the insulation resistance calculated in the next measurement cycle, and is lower than the threshold value, the output relays are activated or deactivated, depending on the device configuration. This measurement principle is also suitable for identifying symmetrical insulation faults.

3UG4983 voltage reducer module

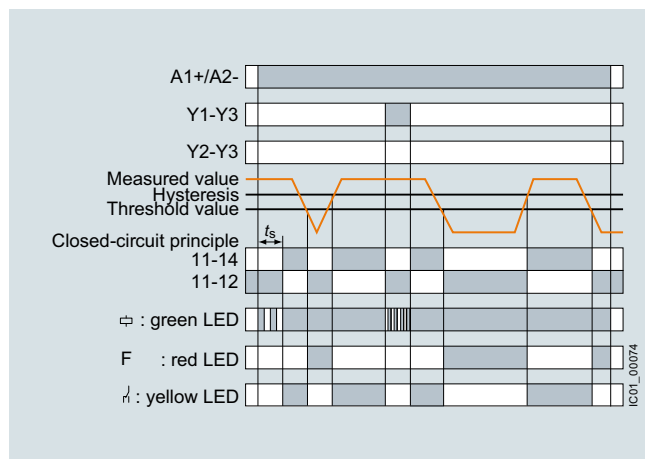
The 3UG4983 passive voltage reducer module can be used to allow the 3UG4583 insulation monitoring relay to be used for insulation monitoring of IT networks with rated voltages of up to 690 V AC and 1 000 V DC.

Technical specifications

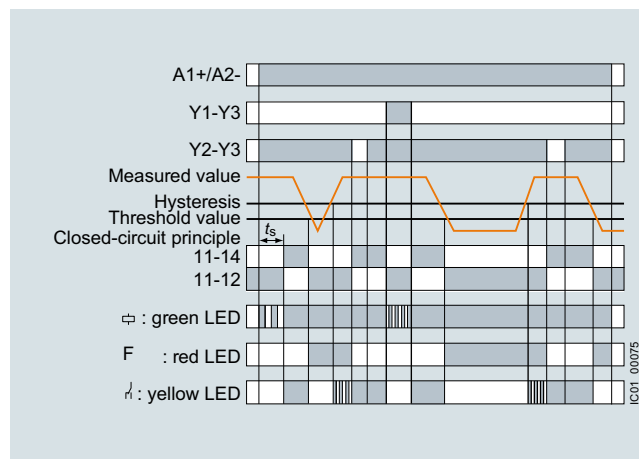
3UG4582 monitoring relays

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage, with Auto RESET



Insulation resistance monitoring with fault storage and Manual RESET



Relays

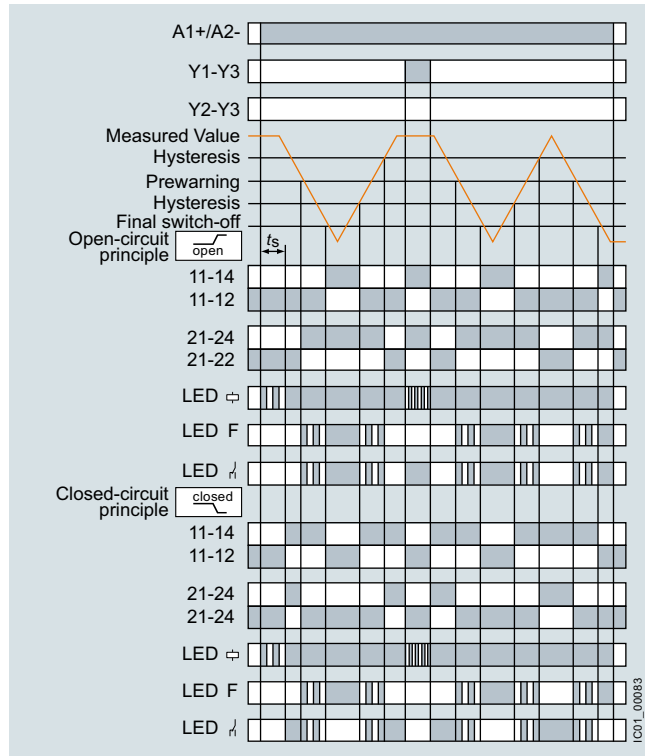
SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Insulation Monitoring

For ungrounded DC and AC networks

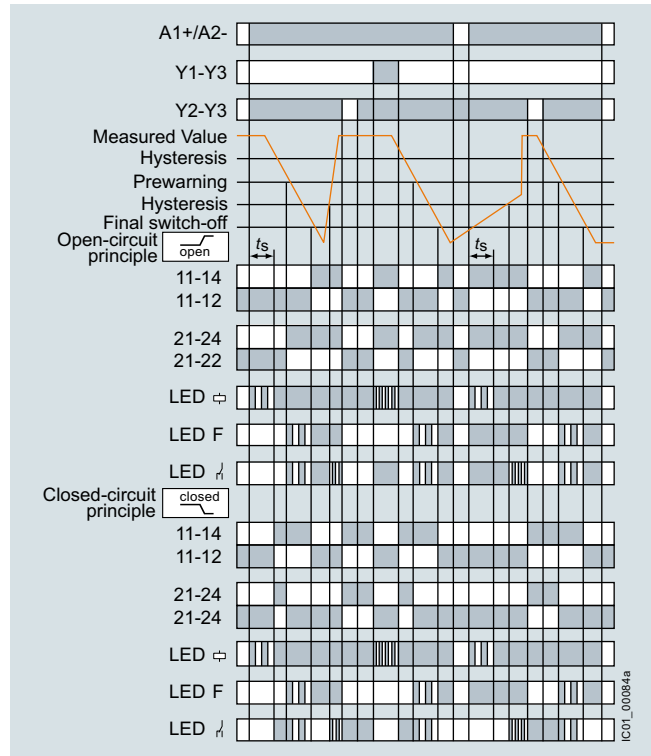
3UG4583 monitoring relays

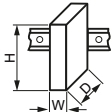

With the closed-circuit principle selected

Insulation resistance monitoring without fault storage,
with Auto RESET



Insulation resistance monitoring with fault storage and
Manual RESET



Type		3UG4582	3UG4583
Dimensions (W x H x D)	 mm	22.5 x 100 x 100	45 x 100 x 100
Connection type		 Screw terminals	
<ul style="list-style-type: none">• Solid• Finely stranded with end sleeve• AWG cables, solid or stranded	mm ² mm ² AWG	2 x (0.5 ... 4) 2 x (0.75 ... 2.5) 2 x (20 ... 14)	
General data			
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to IEC 60664	V	400 supply circuit/measuring circuit, 300 supply circuit/output circuit	400 supply circuit/measuring circuit 300 supply circuit/output circuit, 300 output circuit 1/output circuit 2
Rated impulse withstand voltage U_{imp}	kV	6	
Rated control supply voltage	V AC/DC	24 ... 240	
Rated frequency	Hz	15 ... 400	
Measuring circuit			
Rated line voltage of the network being monitored	V V	0 ... 250 AC, 0 ... 300 DC	0 ... 300 AC, 0 ... 690 AC with 3UG49 83 0 ... 600 DC, 0 ... 1 000 DC with 3UG49 83
Rated frequency of the network being monitored	Hz	DC or 15 ... 400	
Setting range for insulation resistance	kΩ	1 ... 100	1 ... 100, 2 ... 200 for 2nd limit value (disconnectable)
Control circuit			
Number of CO contacts for auxiliary contacts		1	2 or 1 + 1, adjustable
Load capacity of the output relay			
<ul style="list-style-type: none">• Thermal current I_{th}	A	4	
Rated operational current I_e at			
<ul style="list-style-type: none">• AC-15/24 ... 400 V• DC-13/24 V	A A	3 2	
Minimum contact load at 24 V DC	mA	10	

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation Insulation Monitoring




For ungrounded DC and AC networks

Selection and ordering data

- Auto or Manual RESET
- Rated control supply voltage U_s 24 ... 240 V AC/DC
- 3UG4582: Closed-circuit principle
- 3UG4583: Open-circuit or closed-circuit principle, adjustable
- 1 or 2 CO contacts
- Fault memory adjustable using control input (Y2-Y3)
- Reset by means of button on front or using control input (Y2-Y3)
- Test by means of button on front or using control input (Y1-Y3)
- 3UG4583: Non-volatile fault storage can be configured
- 3UG4583: 2 separate limit values (e.g. for warning and disconnection) or 2 CO contacts for one limit value (e.g. for a local alarm and signaling to the PLC via separate circuits) can be configured

Note:

With the 3UG4983-1A coupling unit, connection to networks with voltages of up to 690 V AC and 1 000 V DC is possible, [see below](#).

	Rated line voltage U_n	System leakage capacitance	Output relays	Measuring range U_e	Broken wire detection in the measuring range	SD	Screw terminals	PU (UNIT, SET, M)	PS*	PG
	V	μF		kΩ		d	Article No.	Price per PU		
 3UG4582-1AW30	3UG4582 insulation monitors									
	0 ... 250 AC, 0 ... 300 DC	Max. 10	1 CO	1 ... 100	✓	5	3UG4582-1AW30		1	1 unit 41H
 3UG4583-1CW30	3UG4583 insulation monitors									
	0 ... 400 AC, 0 ... 600 DC ¹⁾	Max. 20	2 CO or 1 CO + 1 C O, adjustable	1 ... 100, 2 ... 200 for 2nd limit value, adjustable	✓ Adjustable	5	3UG4583-1CW30		1	1 unit 41H
 3UG4983-1A ✓ Available	Voltage reducer module for 3UG4583									
	For extending the network voltage range to max. 690 V AC and 1 000 V DC					5	3UG4983-1A		1	1 unit 41H

¹⁾ With 3UG4983-1A voltage reducer module suitable also for the insulation monitoring of IT networks of up to 690 V AC and 1 000 V DC.

For accessories, [see page 10/108](#).

Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Level monitoring

Overview



SIRIUS 3UG4501 monitoring relay

The 3UG4501 level monitoring relay is used in combination with 2- or 3-pole sensors to monitor the levels of conductive liquids.

Benefits

- Can be used worldwide thanks to wide voltage range from 24 to 240 V (absolute limit values)
- Individually shortenable 2- and 3-pole wire electrodes for easy mounting from above/below
- Bow electrodes for installation from the side, for larger filling levels and minimum space requirements
- Can be flexibly adapted to different conductive liquids through analog setting of the sensitivity from 2 to 200 k Ω
- Compensation for wave movements through tripping delay times from 0.1 to 10 s
- Upstream or downstream function selectable
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

- Single-point and two-point level monitoring
- Overflow protection
- Dry run protection
- Leak monitoring

Technical specifications

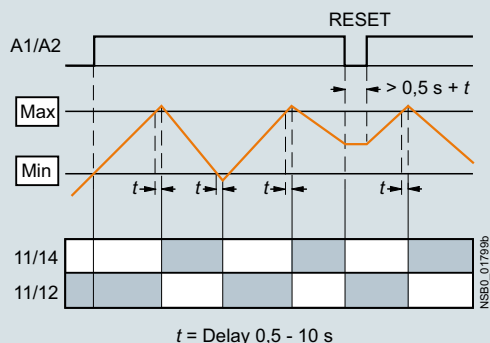
3UG4501 monitoring relays

The principle of operation of the 3UG4501 level monitoring relay is based on measuring the electrical resistance of the liquid between two immersion sensors and a reference terminal. If the measured value is lower than the sensitivity set at the front, the output relay changes its switching state. In order to preclude active current undershooting of the liquid, the sensors are supplied with alternating current.

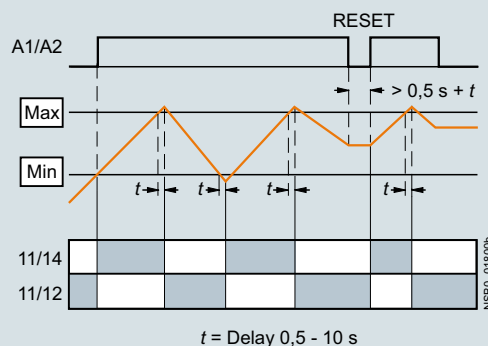
Two-point control

The output relay changes its switching state as soon as the liquid level reaches the maximum sensor, while the minimum sensor is submerged. The relay returns to its original switching state as soon as the minimum sensor no longer has contact with the liquid.

OVER, two-point control



UNDER, two-point control



Note:

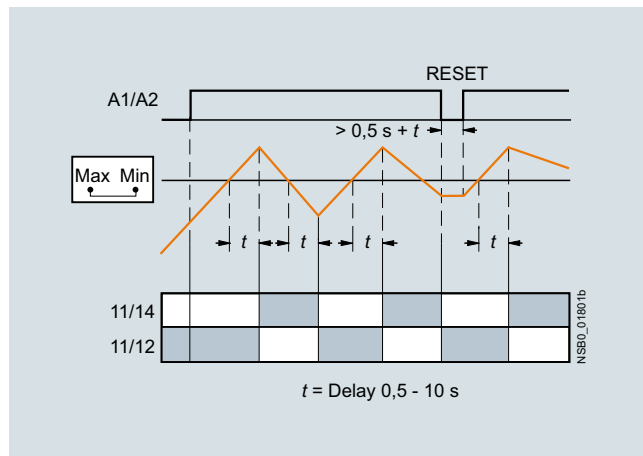
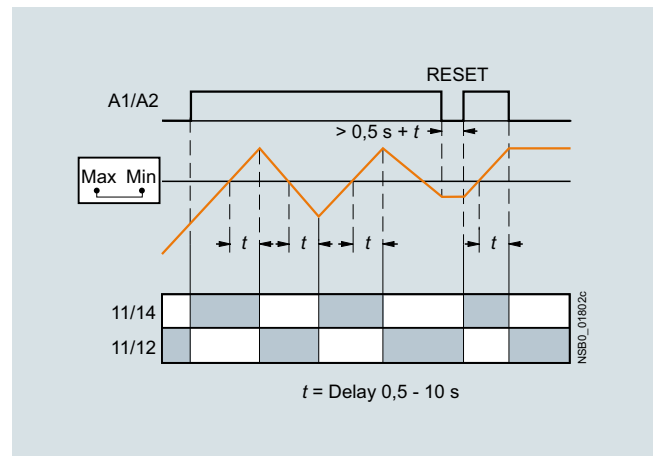
It is also possible to connect other resistance sensors to the Min and Max terminals in the range 2 to 200 k Ω , e.g. photoresistors, temperature sensors, encoders based on resistance, etc. The monitoring relay can therefore also be used for other applications as well as for monitoring the levels of liquids.

Single-point control

If only one level is being controlled, the terminals for Min and Max on the monitoring relay are bridged. The output relay changes its switching state as soon as the liquid level is reached and returns to its original switching state once the sensor no longer has contact with the liquid.

In order to prevent premature tripping of the switching function caused by wave motion or frothing, even though the set level has not been reached, it is possible to delay this function by 0.5 to 10 s.

For safe resetting, the control supply voltage must be interrupted for at least the set delay time of +0.5 s.

OVER, single-point controlUNDER, single-point control

Type		3UG4501
General data		
Rated insulation voltage U_i	V	300
Pollution degree 3 Overvoltage category III acc. to VDE 0110		
Rated impulse withstand voltage U_{imp}	kV	4
Measuring circuit		
Electrode current, max. (typ. 70 Hz)	mA	1
Electrode voltage, max. (typ. 70 Hz)	V	15
Sensor feeder cable	m	Max. 100
Conductor capacitance of sensor cable¹⁾	nF	Max. 10
Control circuit		
Load capacity of the output relay Thermal current I_{th}	A	5
Rated operational current I_e at		
• AC-15/24 ... 400 V	A	3
• DC-13/24 V	A	1
• DC-13/125 V	A	0.2
• DC-13/250 V	A	0.1
Minimum contact load at 17 V DC	mA	5

¹⁾ The sensor cable does not necessarily have to be shielded, but we do not recommend installing this cable parallel to the power supply lines. It is also possible to use a shielded cable, whereby the shield has to be connected to the M terminal.

Relays



SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Level monitoring

Selection and ordering data

- For level monitoring of electrically conductive liquids
- Control principle: inlet or sequence control adjustable per rotary switch
- Single-point and two-point control possible
- Analogically adjustable sensitivity (specific resistance of the liquid)
- Analogically adjustable tripping delay time
- 1 yellow LED for displaying the relay state
- 1 green LED for displaying the applied control supply voltage
- 1 CO contact

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H

Sensitivity	Tripping delay time	Rated control supply voltage U_s	SD	Screw terminals 		SD	Spring-type terminals 	
k Ω	s	V AC/DC	d	Article No.	Price per PU	d	Article No.	Price per PU
2 ... 200	0.5 ... 10	24 ¹⁾	2	3UG4501-1AA30		2	3UG4501-2AA30	
		24 ... 240	2	3UG4501-1AW30		2	3UG4501-2AW30	

¹⁾ The rated control supply voltage and the measuring circuit are not electrically separated.

For accessories, [see page 10/108](#).

Note:

Level monitoring sensors are available from various providers. We recommend sensors made by Jacob GmbH ([see "External partners", page 16/16](#)). The previous 3UG3 level sensors are also available from here.

Overview



SIRIUS 3UG4651 monitoring relay

The 3UG4651 monitoring relay is used in combination with a sensor to monitor motor drives for overspeed and/or underspeed.

Furthermore, the monitoring relay is ideal for all functions where a continuous pulse signal needs to be monitored (e.g. belt travel monitoring, completeness monitoring, passing monitoring, clock-time monitoring).

Benefits

- Can be used worldwide thanks to wide voltage range from 24 to 240 V (absolute limit values)
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Permanent display of actual value and fault type
- Use of up to 10 sensors per rotation for extremely slowly rotating motors
- 2- or 3-wire sensors and sensors with a mechanical switching output or semiconductor output can be connected
- Auxiliary voltage for sensor integrated
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

- Slip or tear of a belt drive
- Overload monitoring
- Transport monitoring for completeness

Technical specifications

3UG4651 monitoring relay

The speed monitoring relay operates according to the principle of period duration measurement.

In the monitoring relay, the time between two successive rising edges of the pulse encoder is measured and compared to the minimum and/or maximum permissible period duration calculated from the set limit values for the speed.

Thus, the period duration measurement recognizes any deviation in speed after just two pulses, even at very low speeds or in the case of extended pulse gaps.

By using up to ten pulse encoders evenly distributed around the circumference, it is possible to shorten the period duration, and in turn the response time. By taking into account the number of sensors in the monitoring relay, the speed continues to be indicated in rpm.

ON-delay time for motor start

To be able to start a motor drive, and depending on whether the open-circuit or closed-circuit principle is selected, the output relay switches to the GO state during the ON-delay time, even if the speed is still below the set value.

The ON-delay time is started by either switching on the auxiliary voltage or, if the auxiliary voltage is already applied, by actuating the respective NC contact (e.g. auxiliary contact).

Speed monitoring with Auto RESET (Memory = no)

If the device is set to Auto RESET, the output relay switches to the GO state, once the adjustable hysteresis threshold is reached in the range of 0.1 to 99.9 rpm and the flashing stops. Any overshoots or undershoots are therefore not stored.



Speed monitoring with Manual RESET (Memory = yes)

If Manual RESET is selected in the menu, the output relay remains in its current switching state and the current measured value and the symbol for overshooting/undershooting continue to flash, even when the speed returns to a permissible value. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ buttons for > 2 s, by connecting the RESET device terminal to 24 V DC or by switching the control supply voltage off and back on again.

Selection and ordering data

- For speed monitoring in revolutions per minute (rpm)
- Two- or three-wire sensor with mechanical or electronic switching output can be connected
- Two-wire NAMUR sensor can be connected
- Sensor supply 24 V DC/50 mA integrated
- Input frequency 0.1 to 2 200 pulses per minute (0.0017 to 36.7 Hz)
- With or without enable signal for the drive to be monitored
- Digitally adjustable, with illuminated LCD
- Overshoot, undershoot or range monitoring adjustable
- Number of pulses per revolution can be adjusted
- Upper and lower threshold value can be adjusted separately
- Auto, Manual or remote RESET options after tripping
- Permanent display of actual value and tripping state
- 1 CO contact

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H

Measuring range	Hysteresis	ON-delay time	Tripping delay time	Pulses per revolution	Rated control supply voltage U_s AC/DC	SD	Screw terminals 	SD	Spring-type terminals 		
rpm	rpm	s	s		V	d	Article No.	Price per PU	d	Article No.	Price per PU
0.1 ... 2 200	OFF 0.1 ... 99.9	0 ... 900	0.1 ... 99.9	1 ... 10	24 ¹⁾	2	3UG4651-1AA30		2	3UG4651-2AA30	
					24 ... 240	2	3UG4651-1AW30		2	3UG4651-2AW30	

¹⁾ The rated control supply voltage and the measuring circuit are not electrically separated.

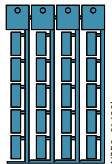




For accessories, see [page 10/108](#).

Relays

SIRIUS 3UG45, 3UG46 Monitoring Relays for Stand-Alone Installation

Accessories

Selection and ordering data

Use	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
d							
Blank labels							
 3RT1900-1SB20	For 3UG4	Unit labeling plates For SIRIUS devices 20 mm x 7 mm, pastel turquoise ¹⁾	20	3RT1900-1SB20	100	340 units	41B
	For 3UG4	Adhesive labels for SIRIUS devices					
		• 19 mm x 6 mm, pastel turquoise	15	3RT1900-1SB60	100	3 060 units	41B
		• 19 mm x 6 mm, zinc yellow	15	3RT1900-1SD60	100	3 060 units	41B
Push-in lugs and covers							
 3RP1903 3RP1902	For 3UG4	Push-in lugs For screw fixing, 2 units are required for each device	5	3RP1903	1	10 units	41H
	For 3UG4	Sealable covers For securing against unauthorized adjustment of setting knobs	5	3RP1902	1	5 units	41H
Covers for insulation monitoring relays							
 3UG4981-0C 3UG4983-0C	For 3UG4581 and 3UG4582	Sealable, transparent covers	5	3UG4981-0C	1	1 unit	41H
	For 3UG4583		5	3UG4983-0C	1	1 unit	41H
Tools for opening spring-type terminals							
 3RA2908-1A	For auxiliary circuit connections	Screwdrivers For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated	2	Spring-type terminals 	1	1 unit	41B
				3RA2908-1A			

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH, see page 16/16.

Note:

For products for mechanical bearing monitoring, e.g. condition monitoring systems, see www.siemens.com/siplus-cms.

Overview



SIRIUS 3UG48 monitoring relays

More information

Homepage, see www.siemens.com/relays

Industry Mall, see www.siemens.com/product?3UG48

For the conversion tool, e.g. from 3UG3 to 3UG4, see www.siemens.com/sirius/conversion-tool

The SIRIUS 3UG4 monitoring relays for electronic and mechanical variables monitor all important characteristics that allow conclusions to be drawn about the functionality of a plant. Both sudden disturbances and gradual changes, which may indicate the need for maintenance, are detected.

Thanks to their relay outputs, the monitoring relays permit direct disconnection of the affected system components and alerting, e.g. by the triggering of a warning light. Thanks to adjustable delay times the 3UG4 monitoring relays can respond very flexibly to brief faults such as voltage dips or load changes and can thus avoid unnecessary alarms and disconnections and increase system availability.

3UG48 monitoring relays for IO-Link

The SIRIUS 3UG48 monitoring relays for IO-Link also offer many other options based upon the monitoring functions of the tried-and-tested SIRIUS 3UG4 monitoring relays:

- Measured value transmission to a controller, including resolution and unit, may be parameterizable as to which value is cyclically transmitted
- Transmission of alarm flags to a controller
- Full diagnosis capability by inquiry as to the cause of the fault in the diagnosis data record
- Remote parameterization is also possible, in addition to or instead of local parameterization
- Rapid parameterization of the same devices by duplication of the parameterization in the controller
- Parameter transmission through uploading to a controller by IO-Link call or by parameter server (if IO-Link master from IO-Link Specification V1.1 and higher is used)
- Consistent central data storage in the event of parameter change locally or via a controller
- Automatic reparameterizing when devices are exchanged
- Blocking of local parameterization via IO-Link possible
- Faults are saved in parameterizable and non-volatile fashion to prevent an automatic start up after voltage failure and to make sure diagnostics data is not lost
- Integration into the automation level provides the option of parameterizing the monitoring relays at any time via a display unit, or displaying the measured values in a control room or locally at the machine/control cabinet

Even without communication via IO-Link the devices continue to function fully autonomously:

- Parameterization can take place locally at the device, independently of a controller.
- In the event of failure or before the controller becomes available the monitoring relays work as long as the control supply voltage (24 V DC) is present.
- If the monitoring relays are operated without the controller, the 3UG48 monitoring relays have, thanks to the integrated SIO mode, an additional semiconductor output, which switches when the adjustable warning threshold is exceeded.

Thanks to the combination of autonomous monitoring relay function and integrated IO-Link communication, redundant sensors and/or analog signal converters – which previously took over the transmission of measured values to a controller, leading to considerable extra cost and wiring overhead – are no longer needed.

Because the output relays are still present, the monitoring relays increase the functional reliability of the system, since only the controller can fulfill the control tasks if the current measured values are available, whereas the output relays can also be used for the disconnection of the system if limit values that cannot be reached during operation are exceeded.

The individual 3UG48 monitoring relays for IO-Link offer the following functions in different combinations:

- Phase sequence
- Phase failure, neutral conductor failure
- Phase asymmetry
- Undershooting and/or overshooting of limit values for voltage
- Undershooting and/or overshooting of limit values for current
- Undershooting and/or overshooting of power factor limit values
- Monitoring of the active current or the apparent current
- Monitoring of the residual current
- Undershooting and/or overshooting of limit values for speed

Note:

For more information on the IO-Link bus system, see [page 2/97 onwards](#).

Notes on security

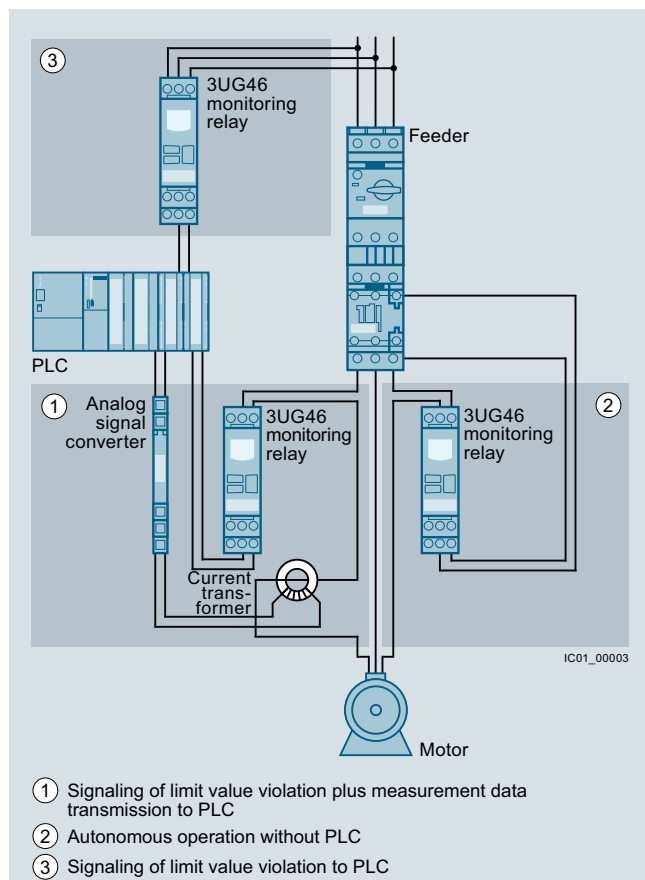
In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions represent only one component of such a concept.

For more information on Industrial Security, see www.siemens.com/industrialsecurity.

Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

General data



Use of conventional monitoring relays

Notes:

Devices required for the communication via IO-Link:

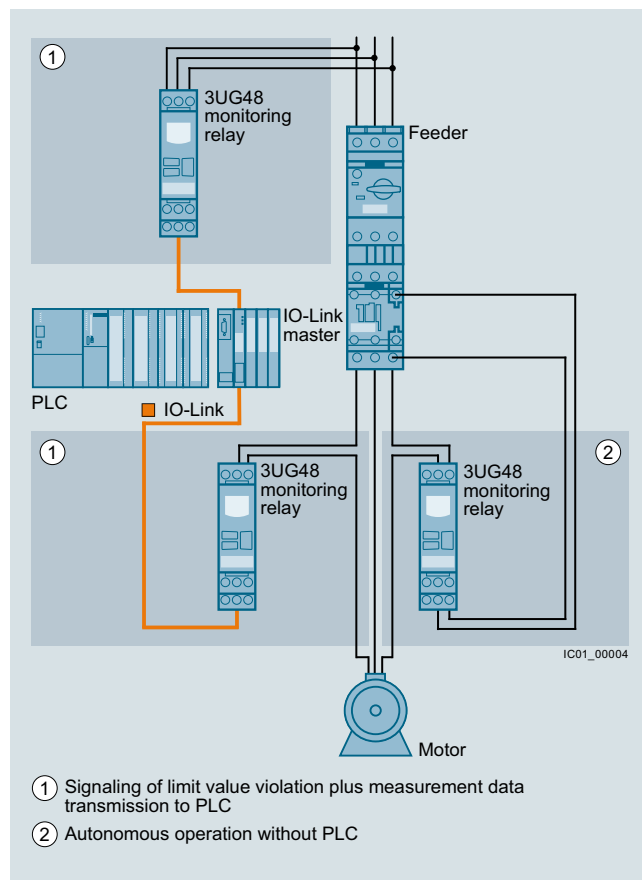
- Any controller that supports IO-Link (e.g. ET 200SP with CPU or S7-1200), [see Catalog ST 70](#).
- IO-Link master (e.g. CM 4xIO-Link for SIMATIC ET 200SP, [see page 2/105](#) or SM 1278 for S7-1200, [see page 2/104](#)).

Article No. scheme

Product versions		Article number	
3UG4 monitoring relay with IO-Link		3UG4	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 0
Type of setting	e. g. 8 = analogically adjustable	<input type="checkbox"/>	
Functions	e.g. 15 = line monitoring	<input type="checkbox"/> <input type="checkbox"/>	
Connection type	Screw terminals		1
	Spring-type terminals (push-in)		2
Contacts	e.g. A = 1 CO contact	<input type="checkbox"/>	
Supply voltage	e.g. A4 = 160 ... 690 V AC		<input type="checkbox"/> <input type="checkbox"/>
Example		3UG4	8 1 5 - 1 A A 4 0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.



Monitoring relays for IO-Link

Each monitoring relay requires an IO-Link channel.

Benefits

- Simple cyclical transmission of the current measured values, relay switching states and events to a controller
- Remote parameterization
- Automatic reparameterizing when devices are exchanged
- Simple duplication of identical or similar parameterizations
- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration overhead
- Integration in TIA means clear diagnostics if a fault occurs
- Cost saving and space saving in control cabinet due to the elimination of AI and IO modules as well as analog signal converters and duplicated sensors

Application

The use of SIRIUS monitoring relays for IO-Link is particularly recommended for machines and plants in which these relays, in addition to their monitoring function, are to be connected to the automation level for the rapid, simple and fault-free provision of the current measured values and/or for remote parameterization.

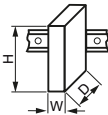


The monitoring relays can either relieve the controller of monitoring tasks or, as a second monitoring entity in parallel to and independent of the controller, increase the reliability in the process or in the system. In addition, the elimination of AI and IO modules allows the width of the controller to be reduced despite significantly expanded functionality.

Technical specifications

More information

Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16368/td>
Manual and internal circuit diagrams, see <https://support.industry.siemens.com/cs/ww/en/view/54375430>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16368/faq>

Type	3UG48		
General technical specifications			
Dimensions (W x H x D)			
• For 3 terminal blocks			
- Screw terminals		mm	22.5 x 92 x 91
- Spring-type terminals		mm	22.5 x 94 x 91
• For 4 terminal blocks			
- Screw terminals		mm	22.5 x 103 x 91
- Spring-type terminals	mm	22.5 x 103 x 91	
Permissible ambient temperature			
• During operation	°C	-25 ... +60	
Connection type		 Screw terminals	
• Terminal screw		M3 (for standard screwdriver, size 2 and Pozidriv 2)	
• Solid	mm ²	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)	
• Tightening torque	Nm	0.8 ... 1.2	
Connection type		 Spring-type terminals	
• Solid	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded, with end sleeve acc. to DIN 46228	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded	mm ²	2 x (0.25 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)	

Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Line monitoring

Overview



SIRIUS 3UG4815 monitoring relay

Solid-state line monitoring relays provide maximum protection for mobile machines, plants and hoisting equipment or for unstable networks. Network and voltage faults can thus be detected early and rectified before far greater damage ensues.

The line monitoring relays with IO-Link monitor phase sequence, phase failure (with or without N conductor monitoring), phase asymmetry and undervoltage and/or overvoltage.

Phase asymmetry is evaluated as the difference between the greatest and the smallest phase voltage relative to the greatest phase voltage. Undervoltage or overvoltage exist if the set limit values for at least one phase voltage are overshoot or undershot. The rms value of the voltage is measured.

Benefits

- Can be used in any network from 160 to 630 V AC worldwide thanks to wide voltage range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display and transmission of actual value and network fault type to controller
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The relays are used above all for mobile equipment, e.g. air conditioning compressors, refrigerating containers, building site compressors and cranes.

Function	Application
Phase sequence	<ul style="list-style-type: none"> • Direction of rotation of the drive
Phase failure	<ul style="list-style-type: none"> • A fuse has tripped • Failure of the control supply voltage • Broken cable
Phase asymmetry	<ul style="list-style-type: none"> • Overheating of the motor due to asymmetrical voltage • Detection of asymmetrically loaded networks
Undervoltage	<ul style="list-style-type: none"> • Increased current on a motor with corresponding overheating • Unintentional resetting of a device • Network collapse, particularly with battery power
Overvoltage	<ul style="list-style-type: none"> • Protection of a plant against destruction due to overvoltage

Technical specifications

3UG4815/3UG4816 monitoring relays

The 3UG4815 and 3UG4816 line monitoring relays have a wide voltage range input and are supplied with power through IO-Link or from an external 24 V DC source.

The device is equipped with a display and is parameterized using three buttons. The 3UG4815 monitoring relay monitors three-phase networks with regard to phase sequence, phase failure, phase asymmetry, undervoltage and overvoltage. The 3UG4816 monitoring relay monitors the neutral conductor as well. The hysteresis is adjustable from 1 to 20 V.

The device has two separately adjustable delay times for overvoltage and undervoltage and for line stabilization. If the direction of rotation is incorrect or a phase fails, the device switches off immediately. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from and potentially high feedback through the load.

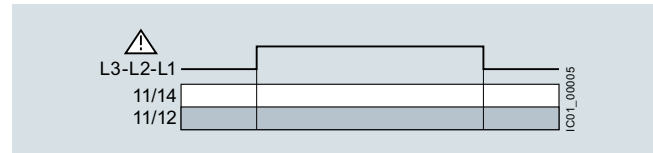
The 3UG4815 and 3UG4816 monitoring relays can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continue to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for 2.5 s.

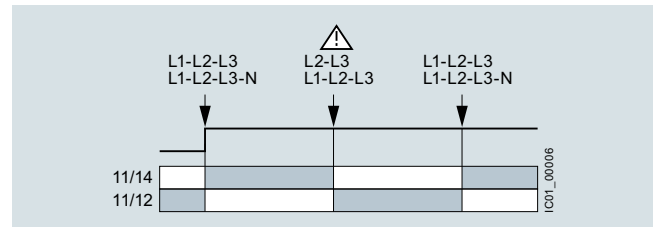
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected

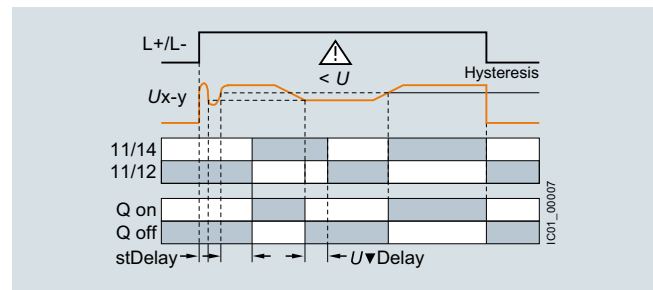
Wrong phase sequence



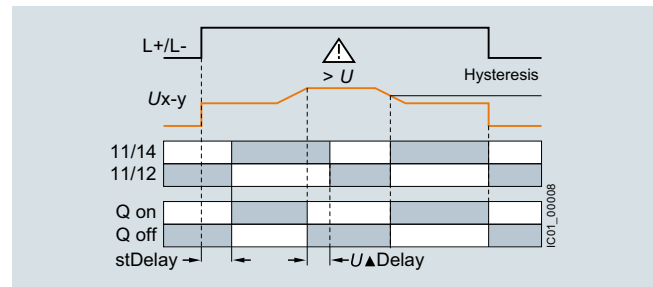
Phase failure



Undervoltage



Overvoltage



Type	3UG4815, 3UG4816	
General technical specifications		
Rated insulation voltage U_i Pollution degree 2 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Control circuit		
Load capacity of the output relay		
• Thermal current I_{th}	A	5
Rated operational current I_e at		
• AC-15/24 ... 400 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
Minimum contact load at 17 V DC	mA	5
Electrical endurance AC-15	Million operating cycles	0.1
Mechanical endurance	Million operating cycles	10

Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Line monitoring

Selection and ordering data

- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Auto or Manual RESET
- Open- or closed-circuit principle
- 1 CO contact, 1 semiconductor output (in SIO mode)

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H



3UG4815-1AA40





3UG4816-1AA40



3UG4815-2AA40



3UG4816-2AA40

Adjust- able hys- teresis	Under- voltage detection	Over- voltage detection	Stabilization time adjustable stDEL	Tripping delay time adjustable Del	Version of auxiliary contacts	Measurable line volt- age ¹⁾	SD	Screw terminals 		SD	Spring-type terminals 	
V			s	s		V AC	d	Article No.	Price per PU	d	Article No.	Price per PU
Monitoring of phase sequence, phase failure, phase asymmetry, overvoltage and undervoltage												
1 ... 20	✓	✓	0.1 ... 999.9	0.1 ... 999.9	1 CO + 1 Q ²⁾	160 ... 690	2	3UG4815-1AA40	2		3UG4815-2AA40	
Monitoring of phase sequence, phase and N conductor failure, phase asymmetry, overvoltage and undervoltage												
1 ... 20	✓	✓	0.1 ... 999.9	0.1 ... 999.9	1 CO + 1 Q ²⁾	90 ... 400 to N	2	3UG4816-1AA40	2		3UG4816-2AA40	

✓ Function available

¹⁾ Absolute limit values.

²⁾ In SIO mode.

For accessories, [see page 10/131](#).

Overview



SIRIUS 3UG4832 monitoring relays

The relays monitor single-phase AC voltages (rms value) and DC voltages against the set limit value for overshoot and undershoot.

Benefits

- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display and transmission of actual value and status messages to controller
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

- Protection of a plant against destruction due to overvoltage
- Switch-on of a plant at a defined voltage and higher
- Protection from undervoltage due to overloaded control supply voltages, particularly with battery power

Technical specifications

3UG4832 monitoring relays

The 3UG4832 voltage monitoring relays are supplied with power through IO-Link or with an external auxiliary voltage of 24 V DC and perform overshoot, undershoot or range monitoring of the voltage depending on parameterization. The devices are equipped with a display and are parameterized by means of three buttons or through IO-Link.

The measuring range extends from 10 to 600 V AC/DC. The limit values for overshoot or undershoot can be freely configured within this range. If one of these limit values is reached, the output relay responds according to the set principle of operation as soon as the delay time has elapsed. This tripping delay time $U\Delta\text{Del}/U\nabla\text{Del}$ can be set from 0 to 999.9 s, as can the ON-delay time onDel. The hysteresis is adjustable from 0.1 to 300 V.

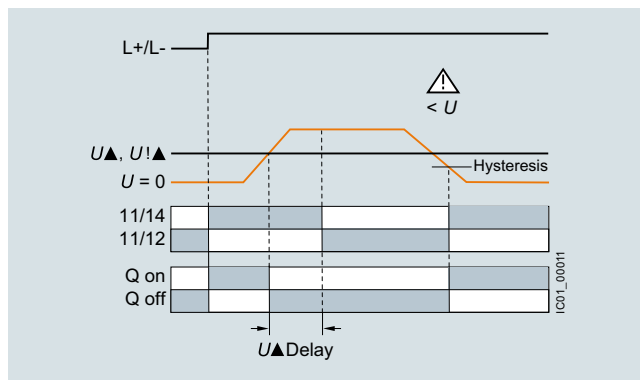
The device can be operated on the basis of either the open-circuit or closed-circuit principle and with Manual or Auto RESET. One output changeover contact is available as a signaling contact, and a semiconductor output is available in addition in SIO mode.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continue to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for 2.5 s.

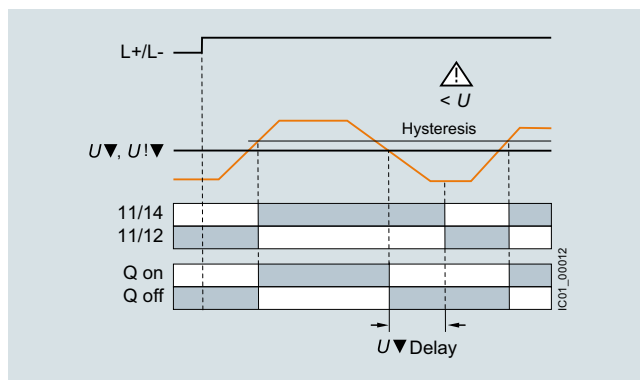
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected

Overvoltage



Undervoltage



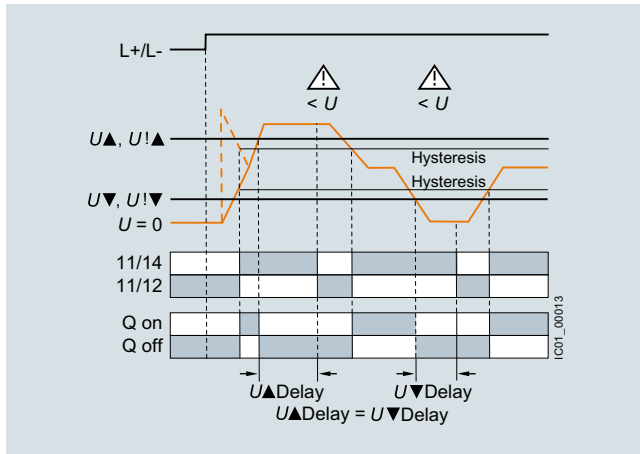
Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Voltage monitoring

With the closed-circuit principle selected

Range monitoring



Type		3UG4832
General technical specifications		
Rated insulation voltage U_i	V	690
Pollution degree 2 Overvoltage category III acc. to VDE 0110		
Rated impulse withstand voltage U_{imp}	kV	6
Measuring circuit		
Permissible measuring range single-phase AC/DC voltage	V	10 ... 690
Measuring frequency	Hz	40 ... 500
Setting range single-phase voltage	V	10 ... 600
Control circuit		
Load capacity of the output relay		
• Thermal current I_{th}	A	5
Rated operational current I_e at		
• AC-15/24 ... 400 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
Minimum contact load at 17 V DC	mA	5

Selection and ordering data

- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Auto or Manual RESET
- Open- or closed-circuit principle
- 1 CO contact, 1 semiconductor output (in SIO mode)



PU (UNIT, SET, M) = 1
PS* = 1 unit
PG = 41H



3UG4832-1AA40



3UG4832-2AA40

Measuring range	Adjustable hysteresis	ON-delay time adjustable onDel	Tripping delay time separately adjustable U▲Del/U▼Del	SD	Screw terminals 		SD	Spring-type terminals 	
V AC/DC	V	s	s	d	Article No.	Price per PU	d	Article No.	Price per PU
Monitoring of voltage for overshoot or undershoot									
10 ... 600	0.1 ... 300	0 ... 999.9	0 ... 999.9	2	3UG4832-1AA40		2	3UG4832-2AA40	

For accessories, [see page 10/131](#).

Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Current monitoring

Overview



SIRIUS 3UG4822 monitoring relays

The relays monitor single-phase AC (rms value) and DC currents against the set limit value for overshoot and undershoot.

Benefits

- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Width 22.5 mm
- Display and transmission of actual value and status messages to controller
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

- Overcurrent and undercurrent monitoring
- Monitoring the functionality of electrical loads
- Monitoring for broken conductors

Technical specifications

3UG4822 monitoring relays

The 3UG4822 current monitoring relays are supplied with power through IO-Link or with an external voltage of 24 V DC and perform overshoot, undershoot or range monitoring of the current depending on the parameterization. The devices are equipped with a display and are parameterized using three buttons.

The measuring range extends from 0.05 to 10 A. For larger AC currents the measuring range can be extended by using commercially available current transformers. Using the adjustable transformer factor, the display of the measured primary currents up to 750 A instead of the secondary currents (max. 1 A or 5 A) is possible.

The rms value of the current is measured. The limit values for overshoot or undershoot can be freely configured within this range. If one of these limit values is reached, the output relay responds according to the set principle of operation as soon as the delay time $I\Delta$ Del/ $I\nabla$ Del has elapsed. This time and the ON-delay time onDel are adjustable from 0 to 999.9 s.

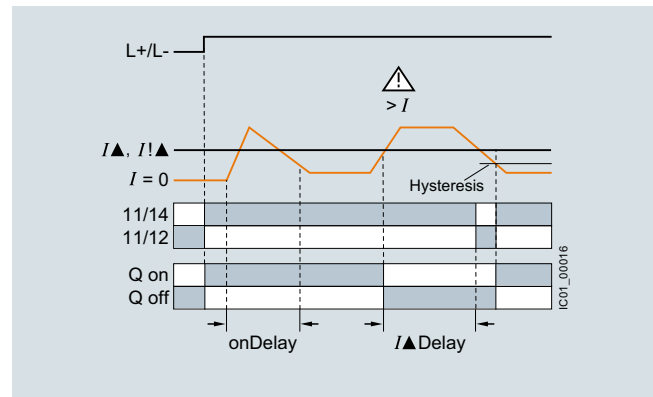
The hysteresis is adjustable from 0.01 to 5 A. The device can be operated with Manual or Auto RESET and on the basis of either the open-circuit or closed-circuit principle. You can decide here whether the output relay is to respond when the supply voltage $U_s = ON$ is applied, or not until the lower measuring range limit of the measuring current ($I > 50$ mA) is reached. One output changeover contact is available as a signaling contact, and a semiconductor output is available in addition in SIO mode.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continue to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for 2.5 s.

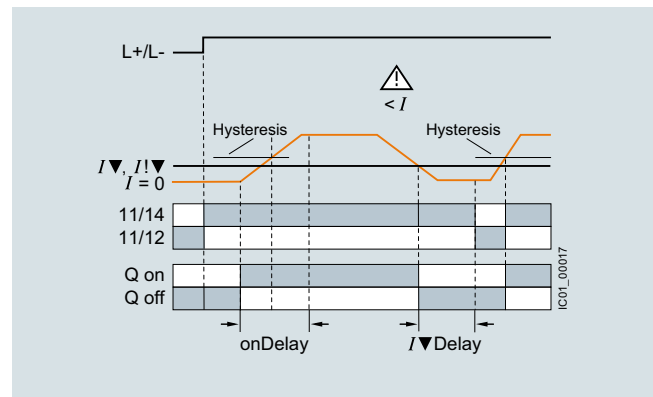
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected upon application of the control supply voltage

Current overshoot

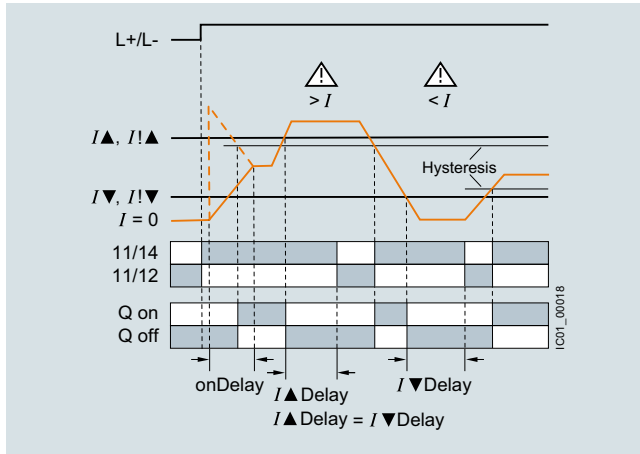


Current undershoot



With the closed-circuit principle selected
upon application of the control supply voltage

Range monitoring



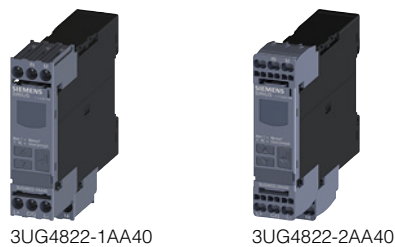
Type	3UG4822	
General technical specifications		
Rated insulation voltage U_i Pollution degree 2 Overvoltage category III acc. to VDE 0110	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Measuring circuit		
Measuring range for single-phase AC/DC current	A	0.05 ... 15
Measuring frequency	Hz	40 ... 500
Setting range for single-phase current	A	0.05 ... 10
Load supply voltage	V	Max. 300 (with protective separation) Max. 500 (with simple separation)
Control circuit		
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13 at - 24 V - 125 V - 250 V	A A A A	3 1 0.2 0.1
Minimum contact load at 17 V DC	mA	5

Relays
SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Current monitoring

Selection and ordering data

- Adjustable via IO-Link and locally, with illuminated LCD
 - Power supply with 24 V DC via IO-Link or external auxiliary voltage
 - Adjustable converter factor to display the measured primary current when an external current transformer is used
 - Auto or Manual RESET
 - Open- or closed-circuit principle
 - 1 CO contact, 1 semiconductor output (in SIO mode)
- PU (UNIT, SET, M) = 1
PS* = 1 unit
PG = 41H



Measuring range	Adjustable hysteresis	ON-delay time adjustable onDel	Tripping delay time separately adjustable /▲Del/▼Del	SD	Screw terminals	SD	Spring-type terminals
A AC/DC	A	s	s	d	Article No. Price per PU	Article No. Price per PU	Article No. Price per PU
Monitoring of current for overshooting and undershooting							
0.05 ... 10	0.01 ... 5	0.1 ... 999.9	0.1 ... 999.9	2	3UG4822-1AA40	2	3UG4822-2AA40

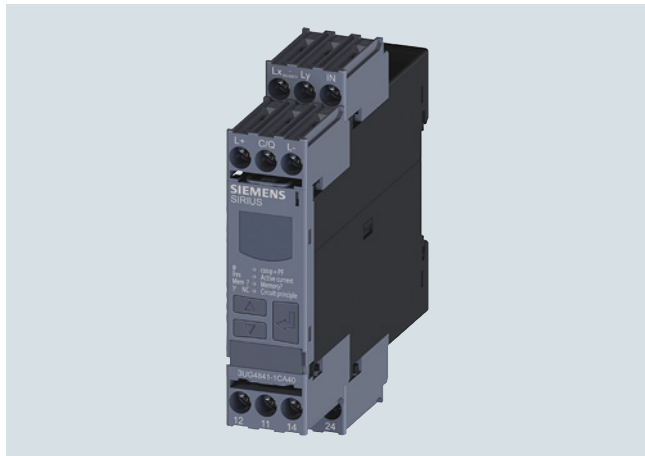
For accessories, [see page 10/131](#).

For AC currents $I > 10\text{ A}$ it is possible to use commercially available current transformers, e.g. the Siemens 4NC current transformer, as accessories, [see Catalog LV 10](#).

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Power factor and active current monitoring

Overview



SIRIUS 3UG4841 monitoring relay

The 3UG4841 power factor and active current monitoring devices enable the load monitoring of motors.

Whereas power factor (p.f.) monitoring is used above all for monitoring no-load operation, the active current monitoring option can be used to observe and evaluate the load factor over the entire torque range.

Benefits

- Monitoring of even small single-phase motors with a no-load supply current below 0.5 A
- Simple determination of threshold values by the direct collection of measured variables on motor loading
- Range monitoring and active current measurement enable detection of cable breaks between control cabinets and motors, as well as phase failures
- Power factor (p.f.) and/or I_{res} (active current) can be selected as the measurement principle
- Width 22.5 mm
- Display and transmission of actual value and status messages to controller
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

- No-load monitoring and load shedding, such as in the event of a V-belt tear
- Underload monitoring in the low-end performance range, e.g. in the event of pump no-load operation
- Monitoring of overload, e.g. due to a dirty filter system
- Power factor monitoring in networks for control of compensation equipment
- Broken cable between control cabinet and motor

Technical specifications

3UG4841 monitoring relays

The 3UG4841 monitoring relays are supplied with power through IO-Link or with an external auxiliary voltage of 24 V DC and are used for performing overshoot, undershoot or range monitoring of the power factor and/or the resulting active current, depending on parameterization. The load to be monitored is connected upstream of the IN terminal. The load current flows through the terminals IN and Ly/N. The setting range for the power factor is 0 to 0.99 and for the active current I_{res} it is 0.2 to 10 A. If the control supply voltage is switched on and no load current flows, the display will show $I < 0.2$ and a symbol for overrange, underrange or range monitoring. If the motor is now switched on and the current exceeds 0.2 A, the set ON-delay time onDel begins. During this time, if the set limit values are undershot or exceeded, this does not lead to a relay reaction of the changeover contact. If the operational flowing active current and/or the p.f. value falls below or exceeds the respective set threshold value, the tripping delay time begins. When this time has expired, the relay changes its switch position. The relevant measured variables for overshooting and undershooting in the display flash. If monitoring for active current undershoot is switched off ($I_{res} \nabla = \text{OFF}$), and if the load current undershoots the lower measuring range threshold (0.2 A), the CO contacts remain unchanged. If a threshold value is set for the monitoring of active current undershooting, then undershooting of the measuring range threshold (0.2 A) will result in a response of the CO contacts.

The relay operates either according to the open-circuit or closed-circuit principle.

If the device is set to Auto RESET (Memory = No), depending on the set principle of operation, the switching relay returns to its initial state and the flashing ends when the hysteresis threshold is reached.

If Manual RESET is selected in the menu (Memory = Yes), the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continue to flash, even when the measured variable reaches a permissible value again. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for 2.5 s.

With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

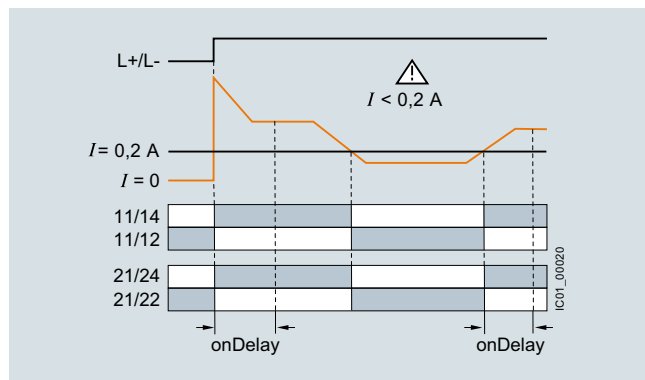
Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

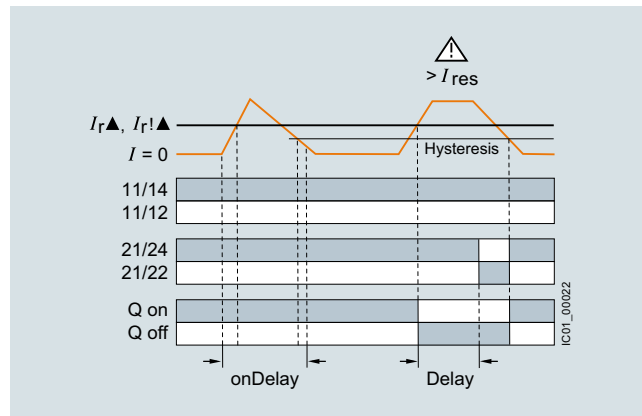
Power factor and active current monitoring

With the closed-circuit principle selected

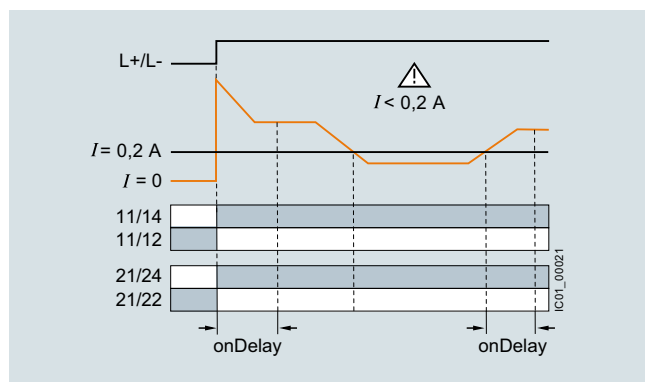
Response in the event of undershooting the measuring range limit with activated monitoring of I_{res} ▼



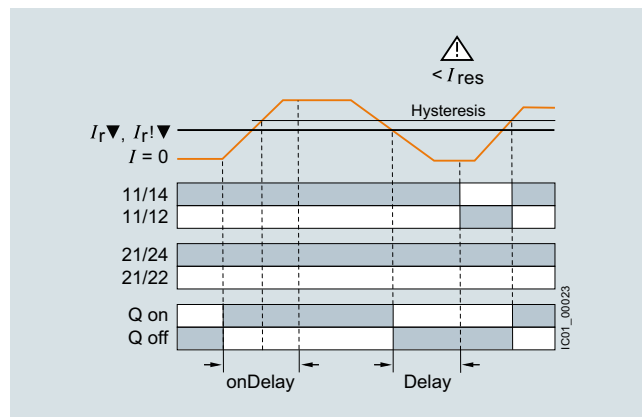
Overshooting of active current



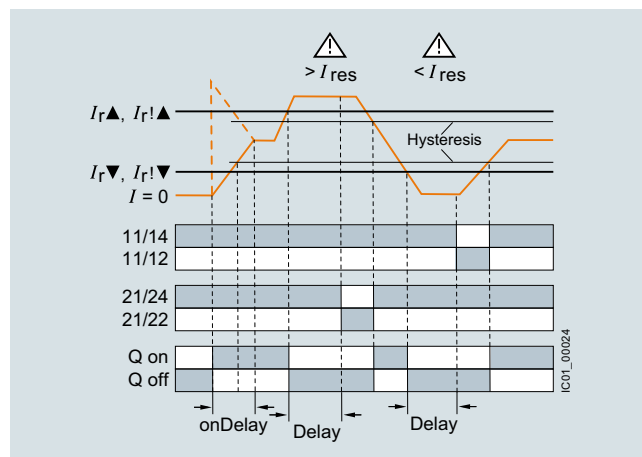
Response in the event of undershooting the measuring range limit with deactivated monitoring of active current undershooting



Undershooting of active current



Range monitoring of active current

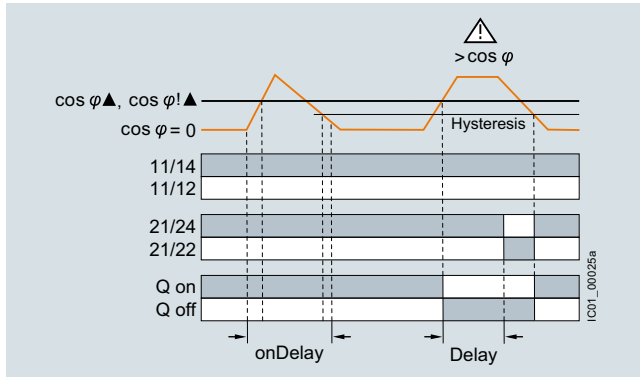


SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

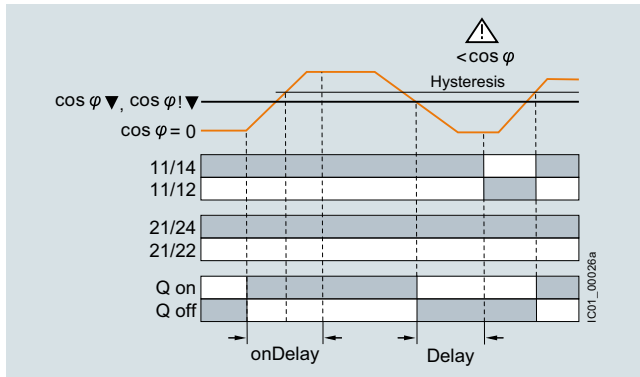
Power factor and active current monitoring

With the closed-circuit principle selected

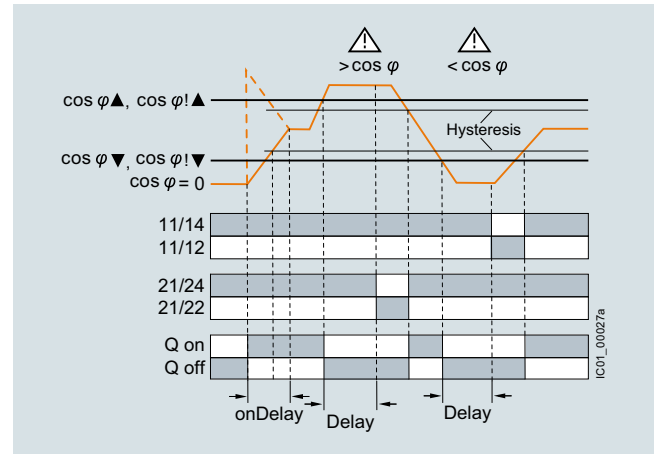
Overshooting of power factor



Undershooting of power factor



Range monitoring of power factor



Type	3UG4841	
General technical specifications		
Rated insulation voltage U_i Pollution degree 2 Overvoltage category III according to IEC 60664-1	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Control circuit		
Number of CO contacts for auxiliary contacts	2	
Load capacity of the output relay • Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 400 V • DC-13 at - 24 V - 125 V - 250 V	A A A A	3 1 0.2 0.1
Minimum contact load at 17 V DC	mA	5

Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Power factor and active current monitoring

Selection and ordering data

- For monitoring the power factor and the active current I_{res} (p.f. $\times I$)
- Suitable for single- and three-phase currents
- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Overshoot, undershoot or range monitoring adjustable
- Upper and lower limit values can be adjusted separately
- Permanent display of actual value and tripping state
- 1 CO contact each for undershoot and overshoot, 1 semiconductor output (in SIO mode)



PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H



3UG4841-1CA40



3UG4841-2CA40

Measuring range		Voltage range of the measuring voltage ¹⁾	Hysteresis		ON-delay time adjustable onDel	Tripping delay time separately adjustable $U\blacktriangle Del / U\blacktriangledown Del, \varphi\blacktriangle Del / \varphi\blacktriangledown Del$	SD	Screw terminals 	SD	Spring-type terminals 		
For power factor	For active current I_{res}	50/60 Hz AC	Adjustable for power factor	Adjustable for active current I_{res}								
P.f.	A	V	P.f.	A	s	s	d	Article No.	Price per PU	d	Article No.	Price per PU
Monitoring of power factor and active current for overshooting or undershooting												
0.1 ... 0.99	0.2 ... 10	90 ... 690	0.1 ... 0.2	0.1 ... 3	0 ... 999.9	0 ... 999.9	2	3UG4841-1CA40	2		3UG4841-2CA40	

¹⁾ Absolute limit values.

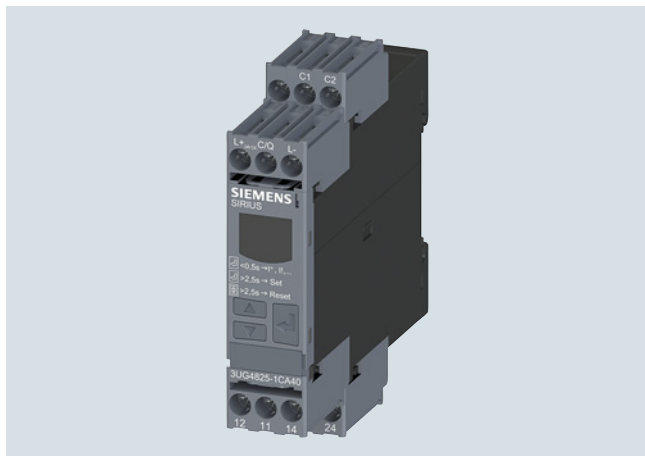
For accessories, [see page 10/131](#).

For AC active currents $I_{res} > 10$ A it is possible to use commercially available current transformers, e.g. Siemens 4NC current transformers, as accessories, [see Catalog LV 10](#).

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link Residual-Current Monitoring

Residual-current monitoring relays

Overview



SIRIUS 3UG4825 monitoring relay

The 3UG4825 residual-current monitoring relays are used in conjunction with the 3UL23 residual-current transformers for monitoring plants in which higher residual currents are increasingly expected due to ambient conditions. Monitoring encompasses pure AC residual currents or AC residual currents with a pulsating DC fault current component (transformer type A in accordance with DIN VDE 0100-530/IEC TR 60755).

Benefits

- High measuring accuracy of $\pm 7.5\%$
- Permanent self-monitoring
- Parameterization of the devices locally or via IO-Link possible
- Variable threshold values for warning and disconnection
- Freely configurable delay times and RESET response
- Display and transmission of actual value and status messages to controller
- High level of flexibility and space saving through installation of the transformer inside or outside the control cabinet
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

Monitoring of plants in which residual currents can occur, e.g. due to dust deposits or moisture, porous cables and leads, or capacitive residual currents.

Technical specifications

3UG4825 monitoring relays

The main conductor, and any neutral conductor to which a load is connected, are routed through the opening of the annular ring core of a residual-current transformer. A secondary winding is placed around this annular ring core to which the monitoring relay is connected.

If operation of a plant is fault-free, the sum of the inflowing and outward currents equals zero. No current is then induced in the secondary winding of the residual-current transformer.

However, if an insulation fault occurs downstream of the residual-current-operated circuit breaker, the sum of the inflowing currents is greater than that of the outward currents. The differential current – the residual current – induces a secondary current in the secondary winding of the transformer. This current is evaluated in the monitoring relay and is used on the one hand to display the actual residual current and on the other, to switch the relay if the set warning or tripping threshold is overshoot.

If the measured residual current exceeds the set warning value, the associated changeover contact instantly changes the switching state and an indication appears on the display.

If the measured residual current exceeds the set tripping value, the set delay time begins and the associated relay symbol flashes. On expiry of this time, the associated changeover contact changes the switching state.

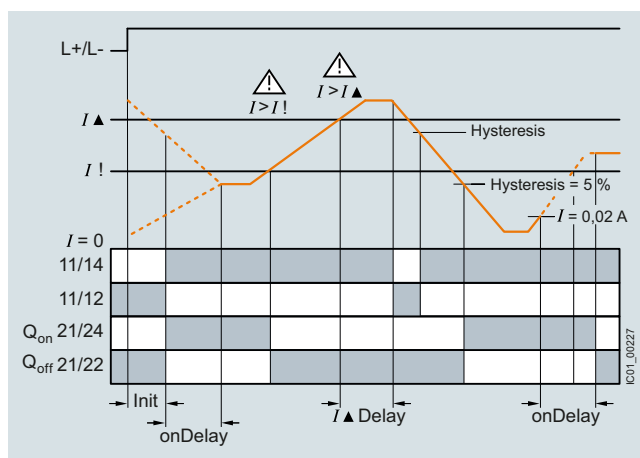
ON-delay time for motor start

To be able to start a drive when a residual current is detected, the output relays switch to the OK state for an adjustable ON-delay time depending on the selected open-circuit principle or closed-circuit principle.

The changeover contacts do not react if the set threshold values are overshoot during this period.

With the closed-circuit principle selected

Residual-current monitoring with Auto RESET (Memory = no)



If the device is set to Auto RESET, the relay switches back to the OK state for the tripping value once the value falls below the set hysteresis threshold and the display stops flashing.

The associated relay changes its switching state if the value falls below the fixed hysteresis value of 5% of the warning value.

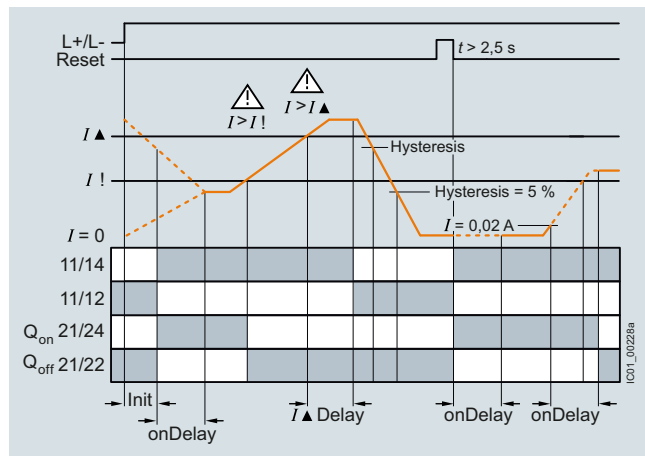
Any overshoots are therefore not stored.

Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link Residual-Current Monitoring

Residual-current monitoring relays

Residual-current monitoring with Manual RESET (Memory = yes)



If Manual RESET is selected in the menu, the output relays remain in their current switching state and the current measured value and the symbol for overshooting continue to flash, even when the measured residual current returns to a permissible value. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ keys for > 2 seconds, or by switching the supply voltage off and back on again.

Note:

The neutral conductor must not be grounded downstream of the summation current transformer as this may impair the function of the residual-current monitoring device.

Type	3UG4825-1CA40, 3UG4825-2CA40	
General data		
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value	V	300
Impulse withstand voltage, rated value U_{imp}	kV	4
Control circuit		
Number of CO contacts for auxiliary contacts		2
Thermal current of the non-solid-state contact blocks, maximum	A	5
Current carrying capacity of the output relay		
• At AC-15 at 250 V at 50/60 Hz	A	3
• At DC-13		
- At 24 V	A	1
- At 125 V	A	0.2
- At 250 V	A	0.1
Operational current at 17 V, minimum	mA	5

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link Residual-Current Monitoring

Residual-current monitoring relays

Selection and ordering data

- For monitoring residual currents from 0.03 to 40 A, from 16 to 400 Hz
- For 3UL23 residual-current transformers with feed-through opening from 35 to 210 mm
- Permanent self-monitoring
- Certified in accordance with IEC 60947, functionality corresponds to IEC 62020
- Digitally adjustable, with illuminated LCD
- Permanent display of actual value and tripping state
- Separately adjustable limit value and warning threshold
- 1 changeover contact each for warning threshold and tripping threshold



PU (UNIT, SET, M) = 1
PS* = 1 unit
PG = 41H



3UG4825-1CA40



3UG4825-2CA40

Measurable current	Adjustable response value current	Switching hysteresis	Adjustable ON-delay time	Control supply voltage	SD	Screw terminals 		SD	Spring-type terminals 	
				At DC rated value		Article No.	Price per PU		Article No.	Price per PU
A	A	%	s	V	d			d		
0.01 ... 43	0.03 ... 40	0 ... 50	0 ... 999.9	24	2	3UG4825-1CA40		2	3UG4825-2CA40	

For accessories, [see page 10/131](#).

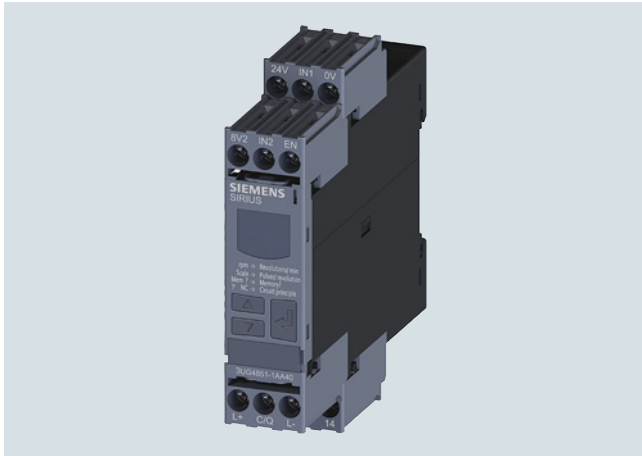
For 3UL23 residual-current transformers and accessories for 3UL23, [see page 10/94](#).

Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Speed monitoring

Overview



SIRIUS 3UG4851 monitoring relay

3UG4851 monitoring relays are used in combination with a sensor to monitor drives for overspeed and/or underspeed.

Furthermore, the monitoring relays are ideal for all functions where a continuous pulse signal needs to be monitored (e.g. belt travel monitoring, completeness monitoring, passing monitoring, clock-time monitoring).

Benefits

- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times and RESET response
- Display and transmission of actual value and fault type to controller
- Use of up to 10 sensors per rotation for extremely slowly rotating motors
- 2- or 3-wire sensors and sensors with a mechanical switching output or semiconductor output can be connected
- Auxiliary voltage for sensor integrated
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

- Slip or tear of a belt drive
- Overload monitoring
- Transport monitoring for completeness

Technical specifications

3UG4851 monitoring relays

The speed monitoring relay operates according to the principle of period duration measurement.

In the monitoring relay, the time between two successive rising edges of the pulse encoder is measured and compared to the minimum and/or maximum permissible period duration calculated from the set limit values for the speed.

Thus, the period duration measurement recognizes any deviation in speed after just two pulses, even at very low speeds or in the case of extended pulse gaps.

By using up to ten pulse encoders evenly distributed around the circumference, it is possible to shorten the period duration, and in turn the response time. By taking into account the number of sensors in the monitoring relay, the speed continues to be indicated in rpm.

ON-delay time for motor start

To be able to start a motor drive, and depending on whether the open-circuit or closed-circuit principle is selected, the output relay switches to the GO state during the ON-delay time, even if the speed is still below the set value.

The ON-delay time is started by either switching on the auxiliary voltage or, if the auxiliary voltage is already applied, by actuating the respective NC contact (e.g. auxiliary contact).

Speed monitoring with Auto RESET (Memory = no)

If the device is set to Auto RESET, the output relay switches to the GO state, once the adjustable hysteresis threshold is reached in the range of 1 to 99.9 rpm and the flashing stops. Any overshoots or undershoots are therefore not stored.

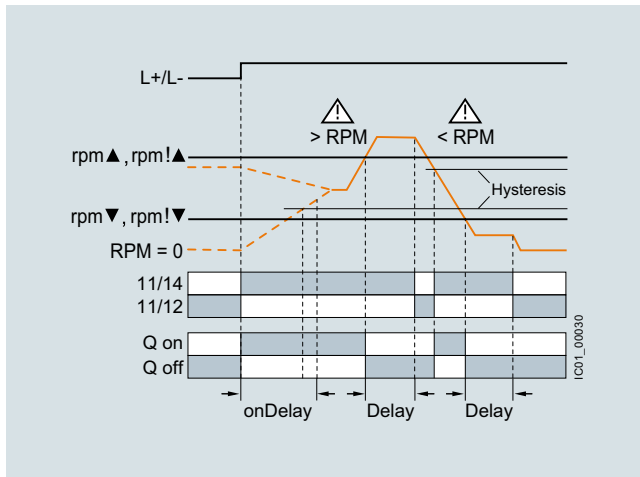
Speed monitoring with Manual RESET (Memory = yes)

If Manual RESET is selected in the menu, the output relay remains in its current switching state and the current measured value and the symbol for overshooting/undershooting continue to flash, even when the speed returns to a permissible value. This stored fault status can be reset by simultaneously pressing the UP▲ and DOWN▼ buttons for > 2.5 s or by connecting the RESET device terminal to 24 V DC.

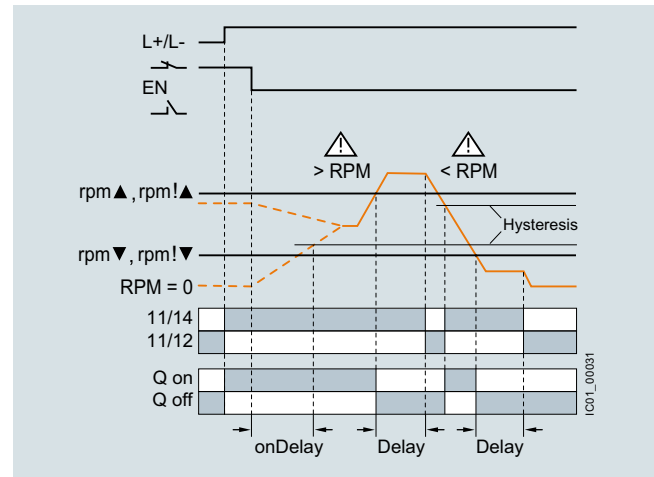
With Manual RESET through IO-Link it is possible in addition to set whether error signals are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local RESET or via IO-Link.

With the closed-circuit principle selected

Range monitoring without enable input



Range monitoring with enable input



Type	3UG4851	
General technical specifications		
Rated insulation voltage U_i Pollution degree 2 Overvoltage category III acc. to VDE 0110	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Measuring circuit		
Sensor supply • For 3-wire sensor (24 V/0 V) • For 2-wire NAMUR sensor (8V2)	mA mA	Max. 50 Max. 8.2
Signal input • IN1 • IN2	kΩ kΩ	16, 3-wire sensor, pnp operation 1, floating contact, 2-wire NAMUR sensor
Voltage level • For level 1 at IN1 • For level 0 at IN1	V V	4.5 ... 30 0 ... 1
Current level • For level 1 at IN2 • For level 0 at IN2	mA mA	> 2.1 < 1.2
Minimum pulse duration of signal	ms	5
Minimum interval between 2 pulses	ms	5
Control circuit		
Number of CO contacts for auxiliary contacts		1
Load capacity of the output relay Thermal current I_{th}	A	5
Rated operational current I_e at • AC-15/24 ... 250 V • DC-13 at - 24 V - 125 V - 250 V	A A A A	3 1 0.2 0.1
Minimum contact load at 17 V DC	mA	5

Relays

SIRIUS 3UG48 Monitoring Relays for Stand-Alone Installation for IO-Link

Speed monitoring

Selection and ordering data

- For speed monitoring in revolutions per minute (rpm)
- Two- or three-wire sensor with mechanical or electronic switching output can be connected
- Two-wire NAMUR sensor can be connected
- Sensor supply 24 V DC/50 mA integrated
- Input frequency 0.1 to 2 200 pulses per minute (0.0017 to 36.7 Hz)
- With or without enable signal for the drive to be monitored
- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Overshoot, undershoot or range monitoring adjustable
- Number of pulses per revolution can be adjusted
- Upper and lower limit values can be adjusted separately
- Auto, Manual or remote RESET options after tripping
- Permanent display of actual value and tripping state
- 1 CO contact, 1 semiconductor output (in SIO mode)



PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H



3UG4851-1AA40

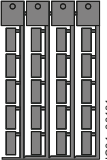
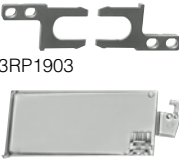




3UG4851-2AA40

Measuring range	Adjustable hysteresis	ON-delay time adjustable onDel	Tripping delay time separately adjustable rpm▲Del/rpm▼Del	Pulses per revolution	SD	Screw terminals 	SD	Spring-type terminals 	
rpm	rpm	s	s		d	Article No.	Price per PU	Article No.	Price per PU
Speed monitoring for overshooting and undershooting									
0.1 ... 2 200	OFF 1 ... 99.9	0 ... 999.9	0 ... 999.9	1 ... 10	2	3UG4851-1AA40	2	3UG4851-2AA40	

For accessories, see [page 10/131](#).

Selection and ordering data

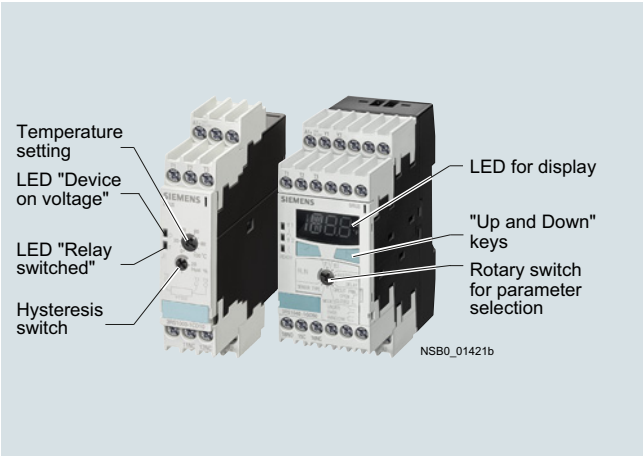
Use	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
d							
Blank labels							
 3RT2900-1SB20	For 3UG48	Unit labeling plates For SIRIUS devices 20 mm x 7 mm, titanium gray ¹⁾	20	3RT2900-1SB20	100	340 units	41B
	For 3UG48	Adhesive labels for SIRIUS devices					
		• 19 mm x 6 mm, pastel turquoise	15	3RT1900-1SB60	100	3 060 units	41B
		• 19 mm x 6 mm, zinc yellow	15	3RT1900-1SD60	100	3 060 units	41B
Push-in lugs and covers							
 3RP1903 3RP1902	For 3UG48	Push-in lugs For screw fixing, 2 units are required for each device	5	3RP1903	1	10 units	41H
	For 3UG48	Sealable covers For securing against unauthorized adjustment of setting knobs	5	3RP1902	1	5 units	41H
Tools for opening spring-type terminals							
 3RA2908-1A	For auxiliary circuit con- nections	Screwdrivers For all SIRIUS devices with spring-type terminals 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	Spring-type terminals 			
				3RA2908-1A	1	1 unit	41B

¹⁾ PC labeling system for individual inscription
of unit labeling plates available from:
murrplastik Systemtechnik GmbH,
[see page 16/16](#).

Relays
SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

General data

Overview



SIRIUS 3RS temperature monitoring relays

More information

Homepage, see www.siemens.com/relays
Industry Mall, see www.siemens.com/product?3RS10

The 3RS10, 3RS11, 3RS20 and 3RS21 temperature monitoring relays can be used for measuring temperatures in solid, liquid and gas media. The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored for overshoot, undershoot or location within a specified range (window function).

The range comprises adjustable analog units with one or two threshold values, digital units for 1 sensor, which are also a good alternative to temperature controllers for the low-end range, and digital units for up to 3 sensors which have been optimized for monitoring large motors.

Article No. scheme

Product versions		Article number										
Temperature monitoring relays		3RS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	
Device type	e.g. 10 = analogically adjustable, 1 sensor		<input type="checkbox"/>	<input type="checkbox"/>								
Version and type of sensor	e.g. 00 = one threshold value, Pt100 sensor			<input type="checkbox"/>	<input type="checkbox"/>							
Connection type	Screw terminals							1				
	Spring-type terminals (push-in)							2				
Number and type of outputs	e.g. C = 1 NO + 1 NC								<input type="checkbox"/>			
Control supply voltage	e.g. D = 24 V AC/DC								<input type="checkbox"/>			
Measuring range	e.g. 0 = -50 ... +50 °C										<input type="checkbox"/>	
Example		3RS	1	0	0	0	-	1	C	D	0	0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Technical specifications

More information

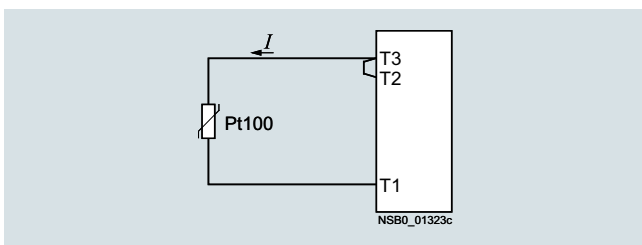
Technical specifications, see
<https://support.industry.siemens.com/cs/ww/en/ps/16369/td>
 Manual and internal circuit diagrams, see
<https://support.industry.siemens.com/cs/ww/en/view/54999309>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16369/faq>

Connection of resistance-type thermometers

Two-wire measurement

When two-wire temperature sensors are used, the resistances of the sensor and wiring are added. The resulting systematic error must be taken into account when the signal evaluation unit is calibrated. A jumper must be clamped between terminals T2 and T3 for this purpose.



Wiring errors

The errors that are generated by the wiring comprise approximately 2.5 K/Ω. If the resistance of the cable is not known and cannot be measured, the wiring errors can also be estimated using the following table.

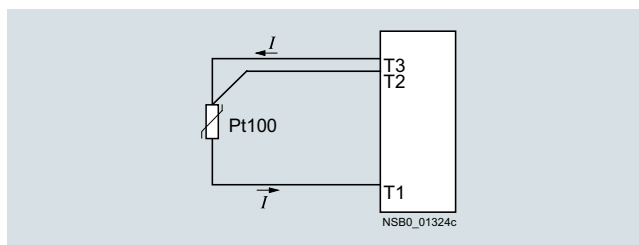
Temperature drift dependent on the length and cross-section of the cable with Pt100 sensors and an ambient temperature of 20 °C, in K:

Cable length in m	Cross-section mm ²			
	0.5	0.75	1	1.5
	Temperature drift in K:			
0	0	0	0	0
10	1.8	1.2	0.9	0.6
25	4.5	3.0	2.3	1.5
50	9.0	6.0	4.5	3.0
75	13.6	9.0	6.8	4.5
100	18.1	12.1	9.0	6.0
200	36.3	24.2	18.1	12.1
500	91.6	60.8	45.5	30.2

Example: On a Pt100 sensor with a cable length of 10 m and a conductor cross-section of 1 mm² the temperature drift equals 0.9 K.

Three-wire measurement

To minimize the effects of the line resistances, a three-wire circuit is often used. Using the additional cable, two measuring circuits can be formed of which one is used as a reference. The signal evaluation unit can then automatically calculate the line resistance and take it into account.



Connection of thermocouples

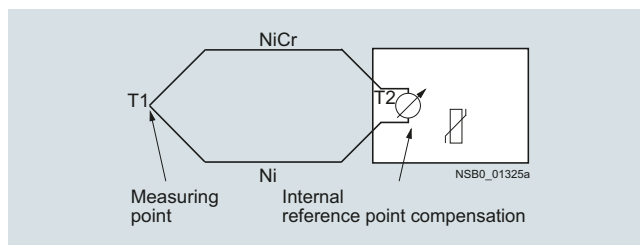
Based on the thermo-electrical effect, a differential temperature measurement will be performed between the measuring point and the signal evaluation unit.

This principle assumes that the signal evaluation unit knows the temperature at the clamping point (T2). For this reason, the 3RS11 temperature monitoring relay has an integral compensator that determines this comparison temperature and builds it into the result of the measurement. The thermal sensors and cables must be insulated therefore.

The absolute temperature is therefore calculated from the ambient temperature of the signal evaluation unit and the temperature difference measured by the thermocouple.

Temperature detection is therefore possible (T1) without needing to know the precise ambient temperature of the clamping point at the signal evaluation unit (T2).

The connecting cable is only permitted to be extended using connecting leads that are made from the same material as the thermocouple. If a different type of conductor is used, an error will result in the measurement.



For more information, see

- www.ephy-mess.com
- Page 16/16

Relays

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

General data

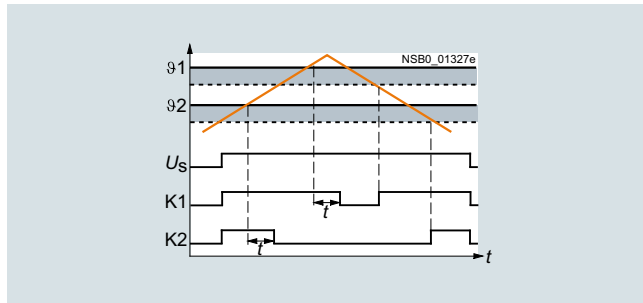
Principle of operation

Once the temperature has reached the set threshold value ϑ_1 , the output relay K1 changes its switching state as soon as the set time t has elapsed (K2 responds in the same manner to ϑ_2). The delay time can only be adjusted with digital units (on analog units $t = 0$).

The relays return to their original state as soon as the temperature reaches the set hysteresis value.

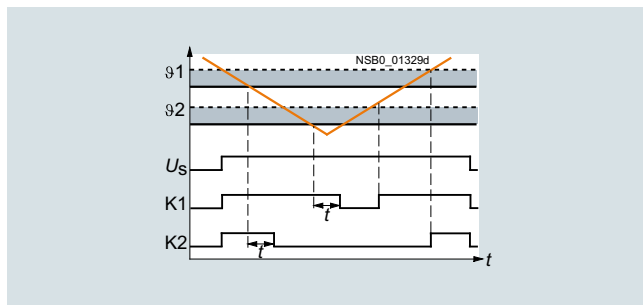
Temperature overshoot

Closed-circuit principle



Temperature undershoot

Closed-circuit principle

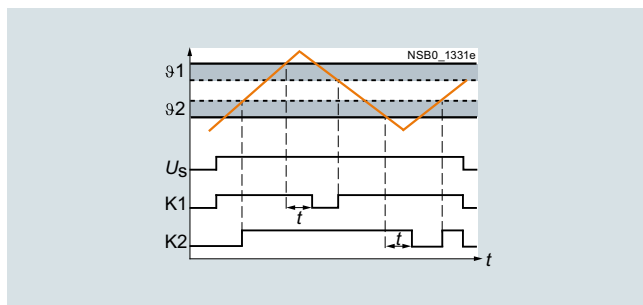


Range monitoring (digital units only)

Once the temperature has reached the upper threshold value ϑ_1 , the output relay K1 changes its switching state as soon as the set time t has elapsed. The relay returns to its original state as soon as the temperature reaches the set hysteresis value.

K2 responds in the same manner to the lower threshold value of ϑ_2 .

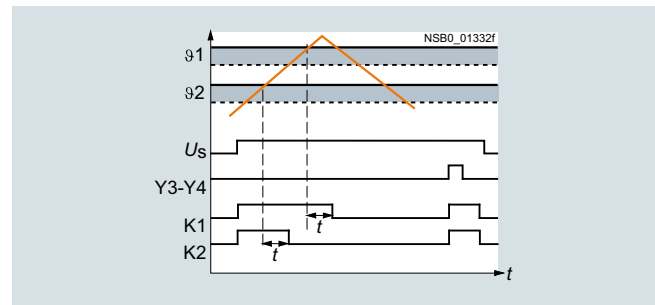
Closed-circuit principle



Principle of operation with memory function (3RS1042, 3RS1142) based on the example of temperature overshoot

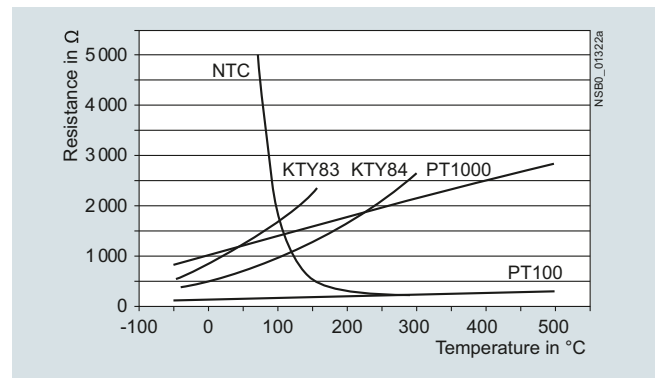
Once the temperature has reached the set threshold value ϑ_1 , the output relay K1 changes its switching state as soon as the set time t has elapsed (K2 responds in the same manner to ϑ_2). The relays only return to the original state when the temperature falls below the set hysteresis value and when terminals Y3-Y4 have been briefly jumpered.

Closed-circuit principle



Characteristic curves

For resistance sensors



The short-circuit and open-circuit detection as well as the measuring range is limited, depending on the sensor type.

Measuring ranges in ̑C for resistance sensors

Sensor type	Short circuit	Open circuit	3RS1040/ 3RS1041 Measuring range in ̑C	3RS1042 Measuring range in ̑C
Pt100	✓	✓	-50 ... +500	-50 ... +750
Pt1000	✓	✓	-50 ... +500	-50 ... +500
KTY83-110	✓	✓	-50 ... +175	-50 ... +175
KTY84	✓	✓	-40 ... +300	-40 ... +300
NTC ¹⁾	✓	--	80 ... 160	80 ... 160

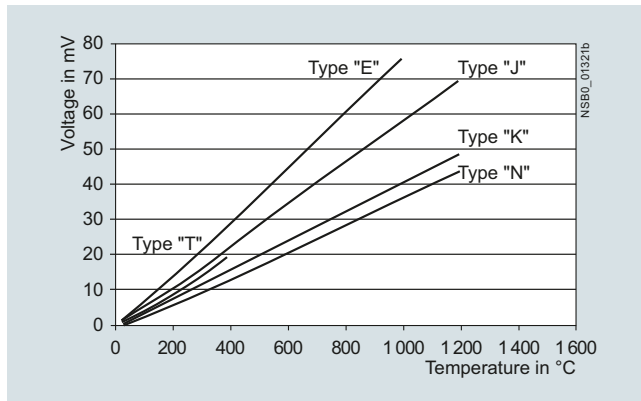
✓ Detection possible

-- Detection not possible

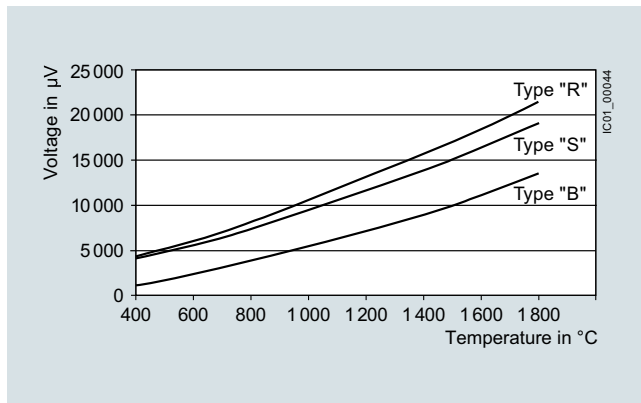
¹⁾ NTC type: B57227-K333-A1 (100 ̑C: 1.8 k̑; 25 ̑C: 32.762 k̑).

Characteristic curves

For thermocouples



Characteristic curves for sensor types J, K, T, E, N



Characteristic curves for sensor types S, R and B

Measuring range in °C for thermocouples

Sensor type	Short circuit	Open circuit	3RS1140 Measuring range in °C	3RS1142 Measuring range in °C
J	--	✓	-99 ... +999	-99 ... +1 200
K	--	✓	-99 ... +999	-99 ... +1 350
T	--	✓	-99 ... +400	-99 ... +400
E	--	✓	-99 ... +999	-99 ... +999
N	--	✓	-99 ... +999	-99 ... +999
S	--	✓	--	0 ... 1 750
R	--	✓	--	0 ... 1 750
B	--	✓	--	400 ... 1 800

✓ Detection possible

-- Detection not possible

Type		3RS10, 3RS11 analog	3RS10, 3RS11, 3RS20, 3RS21 digital
General technical specifications			
Dimensions (W x H x D)			
• Screw terminals		mm 22.5 x 102 x 91	45 x 106 x 91
• Spring-type terminals		mm 22.5 x 103 x 91	45 x 108 x 91
Permissible ambient temperature			
• During operation	°C	-25 ... +60	
Connection type		Screw terminals	
• Terminal screw		M3 (for standard screwdriver, size 2 and Pozidriv 2)	
• Solid	mm ²	1 x (0.5 ... 4)/2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm ²	1 x (0.5 ... 2.5)/2 x (0.5 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)	
Connection type		Spring-type terminals	
• Solid	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded, with end sleeve acc. to DIN 46228	mm ²	2 x (0.25 ... 1.5)	
• Finely stranded	mm ²	2 x (0.25 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (24 ... 16)	

Relays

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, analogically adjustable for 1 sensor

Overview



SIRIUS 3RS analog temperature monitoring relays for 1 sensor

The 3RS10, 3RS11 analog temperature monitoring relays can be used for measuring temperatures in solid, liquid and gas media. The temperature is detected by the sensors in the medium, evaluated by the device and monitored for overshoot or undershoot. When the threshold values are reached, the output relay switches on or off depending on the parameterization.

Benefits

- All devices except for 24 V AC/DC feature electrical separation
- Extremely easy operation using a rotary potentiometer
- Adjustable hysteresis
- Adjustable working principle for devices with 2 threshold values
- All versions with removable terminals
- All versions with screw terminals, many versions alternatively with spring-type terminals

Application

The analogically adjustable SIRIUS 3RS10, 3RS11 temperature monitoring relays can be used in almost any application in which temperature overshoot or undershoot is not permitted, e.g. in the monitoring of set temperature limits and the output of alarm messages for:

- Motor and system protection
- Control cabinet temperature monitoring
- Freeze monitoring
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

Technical specifications

Type		3RS1000, 3RS1010	3RS1100, 3RS1101	3RS1020, 3RS1030	3RS1120, 3RS1121
Auxiliary circuit					
Rated operational currents I_e • AC-15/24 ... 250 V • DC-13 at - 24 V - 125 V - 250 V	A	3			
	A	1			
	A	0.2			
	A	0.1			
Measuring accuracy at 20 °C ambient temperature (T20)		< ± 5% of full-scale value			
Reference point accuracy	K	--	< ± 5	--	< ± 5
Deviations due to ambient temperature In % of the measuring range		< 2	< 3	< 2	< 3
Hysteresis settings • For temperature 1 • For temperature 2	%	2 ... 20 from upper limit of scale			
	%	5 from upper limit of scale			
Sensor circuit					
Typical sensor current • Pt100	mA	1	--	1	--
Open-circuit detection		No			
Short-circuit detection		No			
Three-wire conductor connection ¹⁾		Yes	--	Yes	--
Enclosure					
Rated insulation voltage U_i (pollution degree 3)	V	300			

¹⁾ Two-wire connection of resistance sensors with wire jumper between T2 and T3.





SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, analogically adjustable for 1 sensor

Selection and ordering data

- For temperature monitoring with resistance sensors or thermocouples
- Temperature range -55 °C to +1 000 °C, depending on the sensor type
- Wide voltage range versions are electrically separated
- Analogically adjustable, setting accuracy $\pm 5\%$
- Versions with 2 separately adjustable threshold values and adjustable open/closed-circuit principle
- Hysteresis for threshold value 1 is adjustable (2 to 20%), hysteresis for threshold value 2 is non-adjustable (5%)
- 1 NC + 1 NO for versions with one threshold value
- 1 CO for threshold value 1 and 1 NO for threshold value 2

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H

	Sensors	Function	Measuring range	Rated control supply voltage U_s 50/60 Hz AC	SD	Screw terminals		Spring-type terminals	
						Article No.	Price per PU	Article No.	Price per PU
			°C	V	d				
Analogically adjustable, 1 threshold value, width 22.5 mm; closed-circuit principle; without memory; 1 NO + 1 NC									
	Pt100 (resistance sensor)	Overshoot	-50 ... + 50	24 AC/DC 110/230 AC	10	3RS1000-1CD00	10	3RS1000-2CD00	
			0 ... + 100	24 AC/DC 110/230 AC	10	3RS1000-1CK00	10	3RS1000-2CK00	
			0 ... + 200	24 AC/DC 110/230 AC	2	3RS1000-1CD10	10	3RS1000-2CD10	
		Undershoot	-50 ... + 50	24 AC/DC 110/230 AC	10	3RS1000-1CK10	2	3RS1000-2CK10	
			0 ... + 100	24 AC/DC 110/230 AC	10	3RS1000-1CD20	10	3RS1000-2CD20	
			0 ... + 200	24 AC/DC 110/230 AC	2	3RS1000-1CK20	10	3RS1000-2CK20	
	Type J (thermo-couple)	Overshoot	0 ... + 200	24 AC/DC 110/230 AC	10	3RS1010-1CD00		3RS1100-2CD20	
			0 ... + 600	24 AC/DC 110/230 AC	10	3RS1010-1CK00			
		Undershoot	0 ... + 200	24 AC/DC 110/230 AC	10	3RS1010-1CD10			
			0 ... + 600	24 AC/DC 110/230 AC	10	3RS1010-1CK10			
	Type K (thermo-couple)	Overshoot	0 ... + 200	24 AC/DC 110/230 AC	10	3RS1010-1CD20			
			0 ... + 600	24 AC/DC 110/230 AC	10	3RS1010-1CK20			
		Undershoot	0 ... + 200	24 AC/DC 110/230 AC	10	3RS1100-1CD20	10		
			0 ... + 600	24 AC/DC 110/230 AC	10	3RS1100-1CK20			
		Overshoot	0 ... + 200	24 AC/DC 110/230 AC	10	3RS1100-1CD30			
			0 ... + 600	24 AC/DC 110/230 AC	10	3RS1100-1CK30			
	Pt100 (resistance sensor)	Overshoot	-50 ... + 50	24 AC/DC 24 ... 240 AC/DC	10	3RS1101-1CD20			
			0 ... + 100	24 AC/DC 24 ... 240 AC/DC	10	3RS1101-1CK20			
			0 ... + 200	24 AC/DC 24 ... 240 AC/DC	10	3RS1101-1CD30			
		Undershoot	-50 ... + 50	24 AC/DC 24 ... 240 AC/DC	2	3RS1101-1CK30			
			0 ... + 100	24 AC/DC 24 ... 240 AC/DC	10	3RS1101-1CD40			
			0 ... + 200	24 AC/DC 24 ... 240 AC/DC	10	3RS1101-1CK40			
	Type J (thermo-couple)	Overshoot	0 ... + 200	24 AC/DC 24 ... 240 AC/DC	10				
			0 ... + 600	24 AC/DC 24 ... 240 AC/DC	10				
		Undershoot	0 ... + 200	24 AC/DC 24 ... 240 AC/DC	10				
			0 ... + 600	24 AC/DC 24 ... 240 AC/DC	10				
	Pt100 (resistance sensor)	Overshoot	-50 ... + 50	24 AC/DC 24 ... 240 AC/DC	10				
			0 ... + 100	24 AC/DC 24 ... 240 AC/DC	10				
			0 ... + 200	24 AC/DC 24 ... 240 AC/DC	10				
		Undershoot	-50 ... + 50	24 AC/DC 24 ... 240 AC/DC	2				
			0 ... + 100	24 AC/DC 24 ... 240 AC/DC	10				
			0 ... + 200	24 AC/DC 24 ... 240 AC/DC	10				
	Type J (thermo-couple)	Overshoot	0 ... + 200	24 AC/DC 24 ... 240 AC/DC	10				
			0 ... + 600	24 AC/DC 24 ... 240 AC/DC	10				
		Undershoot	0 ... + 200	24 AC/DC 24 ... 240 AC/DC	10				
			0 ... + 600	24 AC/DC 24 ... 240 AC/DC	10				

For accessories, see page 10/142.

Relays

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, digitally adjustable for 1 sensor

Overview



SIRIUS 3RS digital temperature monitoring relay for 1 sensor

The 3RS10, 3RS11, 3RS20 and 3RS21 temperature monitoring relays can be used for measuring temperatures in solid, liquid and gas media. The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored for overshoot, undershoot or location within a specified range (window function). The 3RS10 and 3RS11 units indicate the measured temperature in °C, the 3RS20 and 3RS21 units in °F.

The units are also an excellent alternative to temperature controllers in the low-end performance range (two- or three-point control).

Benefits

- Very simple operation without complicated menu selections
- Two- or three-point control can be parameterized quickly
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The temperature monitoring relays can be used in almost any application in which temperature overshoot or undershoot is not permitted, e.g. in the monitoring of set temperature limits and the output of alarm messages for:

- Plant and environment protection
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Temperature limits for district heating plants
- Exhaust temperature monitoring
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

Technical specifications

Type		3RS1040, 3RS1042, 3RS2040	3RS1140, 3RS2140	3RS1142
Auxiliary circuit				
Rated operational currents I_e				
• AC-15/24 ... 250 V	A	3		
• DC-13 at:				
- 24 V	A	1		
- 125 V	A	0.2		
- 250 V	A	0.1		
Evaluation unit				
Measuring accuracy at 20 °C ambient temperature (T20)		< ± 2 K, ± 1 digit	< ± 5 K, ± 1 digit	< ± 7 K, ± 1 digit
Reference point accuracy		--	< ± 5 K	
Deviations due to ambient temperature	%	0.05 °C per K deviation from T20		
In % of measuring range				
Measuring cycle	ms	500		
Hysteresis settings for temperature	K	1 ... 99, for both values		
Adjustable delay time	s	0 ... 999		
Sensor circuit				
Typical sensor current				
• Pt100	mA	1	--	--
• Pt1000/KTY83/KTY84/NTC	mA	0.2	--	--
Open-circuit detection		Yes ¹⁾	Yes	Yes
Short-circuit detection		Yes	No	No
Three-wire conductor connection		Yes ²⁾	--	--
Enclosure				
Rated insulation voltage U_i (pollution degree 3)	V AC	300		

¹⁾ Not for NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

²⁾ Two-wire connection of resistance sensors with wire jumper between T2 and T3.



SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, digitally adjustable for 1 sensor

Selection and ordering data

- For temperature monitoring with resistance sensors or thermocouples
- Temperature range dependent on sensor type
- Wide voltage range versions are electrically separated
- Non-volatile
- Short-circuit and open-circuit detection in sensor circuit
- Digitally adjustable, with illuminated LCD
- Overshoot, undershoot or range monitoring adjustable
- Exact sensor type can be set
- 2 separately adjustable threshold values
- 1 hysteresis applies to both thresholds (0 to 99 K)
- 1 delay time applies to both thresholds (0 to 999 s)
- Adjustable open/closed-circuit principle
- Adjustable Manual/remote RESET
- Permanent display of actual value in °C or °F and tripping state
- 1 CO contact each per threshold value
- 1 NO for sensor monitoring

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H

Sensors	Measuring range (measuring range limit depends on the sensor)	Rated control supply voltage U_s 50/60 Hz AC	SD	Screw terminals		SD	Spring-type terminals	
		V	d	Article No.	Price per PU	d	Article No.	Price per PU

Temperature monitoring relay, digitally adjustable, 2 threshold values,
width 45 mm, 1 CO + 1 CO + 1 NO, memory function possible with
external jumper, device parameters are non-volatile



3RS1040-1GD50



3RS1040-2GW50

Pt100/1000; KTY83/84; NTC (resistance sensors) ¹⁾	- 50 ... + 500 °C	24 AC/DC	2	3RS1040-1GD50	2	3RS1040-2GD50
		24 ... 240 AC/DC	2	3RS1040-1GW50	2	3RS1040-2GW50
	- 58 ... + 932 °F	24 AC/DC	10	3RS2040-1GD50	10	3RS2040-2GD50
		24 ... 240 AC/DC	10	3RS2040-1GW50	10	3RS2040-2GW50
TYPE J, K, T, E, N (thermocouple)	- 99 ... + 999 °C	24 AC/DC	2	3RS1140-1GD60	10	3RS1140-2GD60
		24 ... 240 AC/DC	2	3RS1140-1GW60	10	3RS1140-2GW60
	- 99 ... + 1 830 °F	24 AC/DC	10	3RS2140-1GD60	15	3RS2140-2GD60
		24 ... 240 AC/DC	10	3RS2140-1GW60	15	3RS2140-2GW60

Temperature monitoring relay, digitally adjustable,
2 threshold values, width 45 mm, 1 CO + 1 CO + 1 NO,
tripping state and device parameters are non-volatile

Pt100/1000; KTY83/84; NTC (resistance sensors) ¹⁾	- 50 ... + 750 °C	24 AC/DC	10	3RS1042-1GD70	10	3RS1042-2GD70
		24 ... 240 AC/DC	2	3RS1042-1GW70	10	3RS1042-2GW70
TYPE J, K, T, E, N, R, S, B (thermocouple)	- 99 ... + 1 800 °C	24 AC/DC	10	3RS1142-1GD80	10	3RS1142-2GD80
		24 ... 240 AC/DC	2	3RS1142-1GW80	10	3RS1142-2GW80

¹⁾ NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

For accessories, see page 10/142.

Relays

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, digitally adjustable for up to 3 sensors

Overview



SIRIUS 3RS digital temperature monitoring relay for up to 3 sensors

The 3RS10, 3RS20 temperature monitoring relays can be used for measuring temperatures in solid, liquid and gas media. The temperature is detected by the sensor in the medium, evaluated by the device and monitored for overshoot or undershoot or for staying within an operating range (window function). The 3RS10 units indicate the measured temperature in °C, the 3RS20 units in °F. The evaluation unit can evaluate up to 3 resistance sensors at the same time and is specially designed for monitoring motor windings and bearings.

Benefits

- Very simple operation without complicated menu selections
- Space-saving with 45 mm width
- Two- or three-point control can be parameterized quickly
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The 3RS10, 3RS20 temperature monitoring relays can be used in almost any application in which several temperatures have to be monitored simultaneously for overshoot or undershoot or within a range.

Monitoring of set temperature limits and output of alarm messages for:

- Plant and environment protection
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

Technical specifications

Type		3RS1041, 3RS2041
Auxiliary circuit		
Rated operational currents I_e		
• AC-15/24 ... 250 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
DIAZED fuse protection		
• Operational class gG	A	4
Evaluation unit		
Measuring accuracy at 20 °C ambient temperature (T20)		< ± 2 K, ± 1 digit
Deviations due to ambient temperature In % of measuring range		% 0.05 per K deviation from T20
Measuring cycle		ms 500
Hysteresis settings for temperature 1		1 ... 99 K, for both values
Adjustable delay time		s 0 ... 999
Sensor circuit		
Typical sensor current		
• Pt100	mA	1
• Pt1000/KTY83/KTY84/NTC	mA	0.2
Open-circuit detection		Yes ¹⁾
Short-circuit detection		Yes
Three-wire conductor connection		Yes ²⁾
Enclosure		
Rated insulation voltage U_i (pollution degree 3)		V AC 300

¹⁾ Not for NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

²⁾ Two-wire connection of resistance sensors with wire jumper between T2 and T3.

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Relays, digitally adjustable for up to 3 sensors

Selection and ordering data

- For temperature monitoring of solids, liquids, and gases
- For two- and three-conductor resistance sensors or thermocouples
- Temperature range dependent on sensor type
 - for 3RS10: - 50 to + 500 °C
 - for 3RS20: - 58 to + 932 °F
- Wide voltage range versions are electrically separated
- Non-volatile
- Short-circuit and open-circuit detection in sensor circuit
- Digitally adjustable, with illuminated LCD
- Overshoot, undershoot or range monitoring adjustable
- Exact sensor type and number of sensors can be set
- 2 separately adjustable threshold values
- 1 hysteresis; applies to both thresholds (0 to 99 K)
- 1 delay time; applies to both thresholds (0 to 999 s)
- Adjustable open-/closed-circuit principle
- With connectable and disconnectable error memory
- Permanent display of actual value in °C or °F and tripping state
- 1 CO contact each per threshold value
- 1 NO for sensor monitoring

PU (UNIT, SET, M) = 1
 PS* = 1 unit
 PG = 41H

Sensors	Num-ber of sensors	Measuring range (limit of measuring range dependent on sensor)	Rated control supply voltage U_s	SD	Screw terminals	SD	Spring-type terminals	
			V	d	Article No.	Price per PU	Article No.	Price per PU

Motor monitoring relays, digitally adjustable for up to 3 sensors, width 45 mm; 1 CO + 1 CO + 1 NO



3RS1041-1GW50

¹⁾ NTC type: B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

For accessories, see page 10/142.

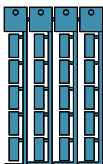




2	3RS1041-1GW50	2	3RS1041-2GW50
10	3RS2041-1GW50	15	3RS2041-2GW50

Relays

SIRIUS 3RS10, 3RS11, 3RS20, 3RS21 Temperature Monitoring Relays

Accessories

Selection and ordering data

Use	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
			d				
Blank labels							
 NS50_01429b 3RT1900-1SB20	For 3RS10, 3RS11, 3RS20, 3RS21	Unit labeling plates For SIRIUS devices 20 mm x 7 mm, pastel turquoise ¹⁾	20	3RT1900-1SB20	100	340 units	41B
	For 3RS10, 3RS11, 3RS20, 3RS21	Adhesive labels for SIRIUS devices • 19 mm x 6 mm, pastel turquoise	15	3RT1900-1SB60	100	3 060 units	41B
		• 19 mm x 6 mm, zinc yellow	15	3RT1900-1SD60	100	3 060 units	41B
Push-in lugs and covers							
 3RP1903	For 3RS10, 3RS11, 3RS20, 3RS21	Push-in lugs For screw fixing, 2 units are required for each device	5	3RP1903	1	10 units	41H
 3RP1902	For 22.5 mm wide 3RS10, 3RS11, 3RS20, 3RS21	Sealable covers For securing against unauthorized adjustment of setting knobs	5	3RP1902	1	5 units	41H
Tools for opening spring-type terminals							
 3RA2908-1A	For auxiliary circuit connections	Screwdrivers For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated	2	Spring-type terminals  3RA2908-1A	1	1 unit	41B

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH, see page 16/16.

For matching sensors, see www.siemens.com/temperature.

Overview



SIRIUS 3RS14, 3RS15 temperature monitoring relay

More information

Homepage, see www.siemens.com/relaysIndustry Mall, see www.siemens.com/product?3RS14

The temperature monitoring relays for IO-Link are used to measure temperatures in solid, liquid and gas media.

The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored up to two limit values for overshooting or undershooting a working range (window function).

In addition to warnings and disconnection in case of temperature deviations, the devices can also be used as a temperature controller (one-point, two-point or three-point control).

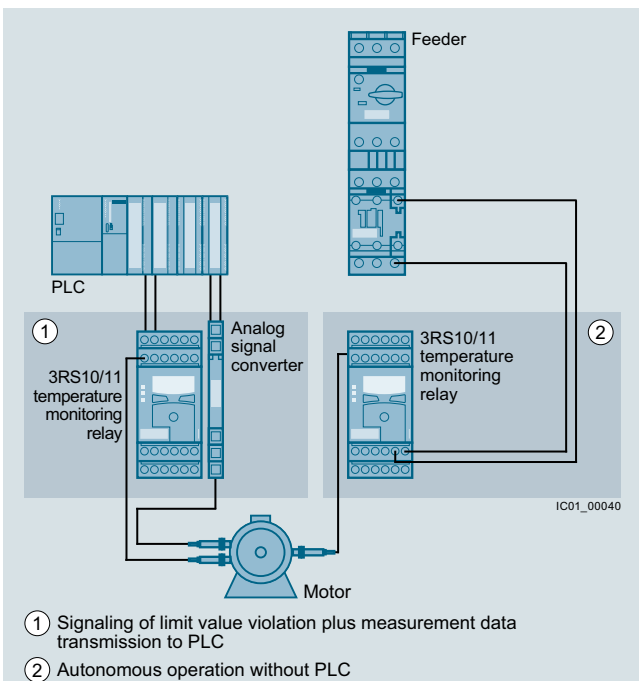
The devices differ from one another in terms of the type and number of connectable temperature sensors.

- 3RS14: Connection for resistance sensor
- 3RS15: Connection for thermocouples

Function	Temperature monitoring relays		
	3RS1440	3RS1441	3RS1540
Connectable sensor type			
Number of sensors monitored	1	3	1
Resistance sensor	✓	✓	--
Thermocouples	--	--	✓
Temperature monitoring			
Temperature monitoring – overshoot	✓	✓	✓
Temperature monitoring – undershoot	✓	✓	✓
Number of adjustable limit values	2	2	2

✓ Function supported

-- Function not supported



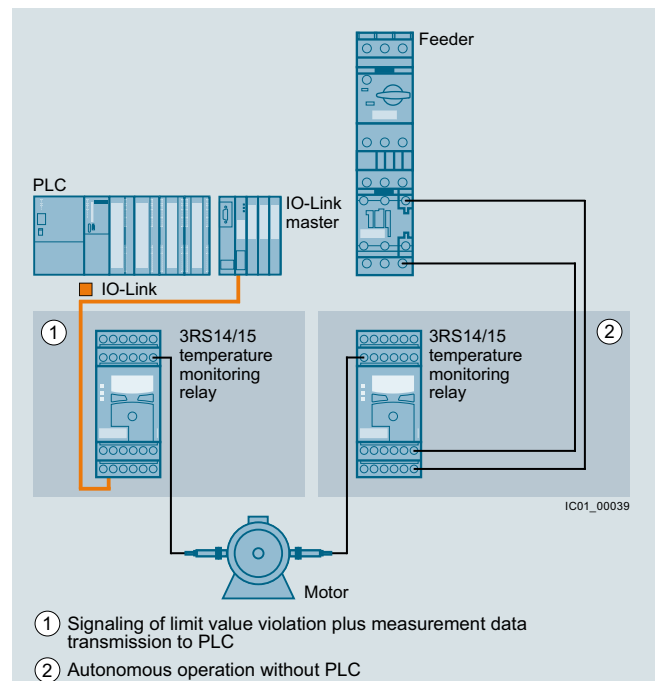
Conventional temperature monitoring relays

Notes:

Devices required for the communication via IO-Link:

- Any controller that supports IO-Link (e.g. ET 200SP with CPU or S7-1200), see [Catalog ST 70](#).
- IO-Link master (e.g. CM 4xIO-Link for SIMATIC ET 200SP, see [page 2/105](#) or SM 1278 for S7-1200, see [page 2/104](#)).

Each monitoring relay requires an IO-Link channel.



Temperature monitoring relays for IO-Link

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions represent only one component of such a concept.

For more information on Industrial Security, see www.siemens.com/industrialsecurity.

Relays

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

General data

Article No. scheme

Product versions		Article number									
Temperature monitoring relays		3RS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0
Device type	e.g. 14 = digitally adjustable, 1 sensor	<input type="checkbox"/>	<input type="checkbox"/>								
Version and type of sensor	e.g. 40 = one threshold value, Pt100/Pt1000, KTY83/KTY84, NTC		<input type="checkbox"/>	<input type="checkbox"/>							
Connection type	Screw terminals							1			
	Spring-type terminals (push-in)							2			
Number and type of outputs	e.g. H = 1 CO								<input type="checkbox"/>		
Control supply voltage	e.g. B = 24 V DC								<input type="checkbox"/>		
Measuring range	e.g. 5 = -50 ... +750 °C									<input type="checkbox"/>	
Example		3RS	1	4	4	0	-	1	H	B	5 0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Technical specifications

More information

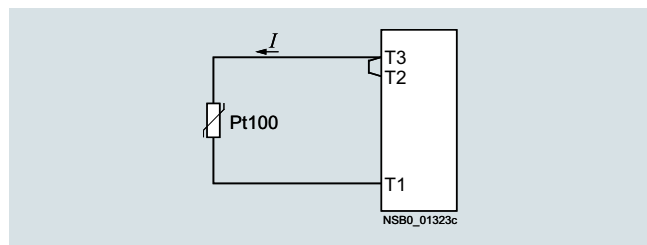
Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16370/td>
Manual and internal circuit diagrams, see <https://support.industry.siemens.com/cs/ww/en/view/54375463>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16370/faq>

Connection for resistance sensors

Two-wire measurement

When two-wire temperature sensors are used, the resistances of the sensor and wiring are added. The resulting systematic error must be taken into account when the signal evaluation unit is calibrated. A jumper must be clamped between terminals T2 and T3 for this purpose.



Wiring errors

The errors that are generated by the wiring comprise approximately 2.5 K/Ω. If the resistance of the cable is not known and cannot be measured, the wiring errors can also be estimated using the following table.

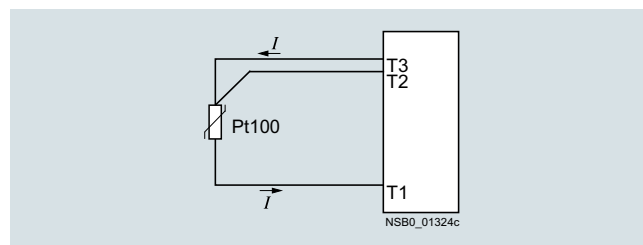
Temperature drift dependent on the length and cross-section of the cable with Pt100 sensors and an ambient temperature of 20 °C, in K:

Cable length in m	Cross-section mm ²			
	0.5	0.75	1	1.5
Temperature drift in K:				
0	0	0	0	0
10	1.8	1.2	0.9	0.6
25	4.5	3.0	2.3	1.5
50	9.0	6.0	4.5	3.0
75	13.6	9.0	6.8	4.5
100	18.1	12.1	9.0	6.0
200	36.3	24.2	18.1	12.1
500	91.6	60.8	45.5	30.2

Example: On a Pt100 sensor with a cable length of 10 m and a conductor cross-section of 1 mm² the temperature drift equals 0.9 K.

Three-wire measurement

To minimize the effects of the line resistances, a three-wire circuit is often used. Using the additional cable, two measuring circuits can be formed of which one is used as a reference. The signal evaluation unit can then automatically calculate the line resistance and take it into account.



Connection of thermocouples

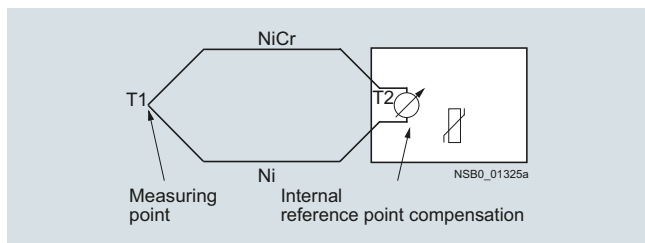
Based on the thermo-electrical effect, a differential temperature measurement will be performed between the measuring point and the signal evaluation unit.

This principle assumes that the signal evaluation unit knows the temperature at the clamping point (T2). For this reason, the 3RS15 temperature monitoring relay has an integral compensator that determines this comparison temperature and builds it into the result of the measurement. The thermal sensors and cables must be insulated therefore.

The absolute temperature is therefore calculated from the ambient temperature of the signal evaluation unit and the temperature difference measured by the thermocouple.

Temperature detection is therefore possible (T1) without needing to know the precise ambient temperature of the clamping point at the signal evaluation unit (T2).

The connecting cable is only permitted to be extended using connecting leads that are made from the same material as the thermocouple. If a different type of conductor is used, an error will result in the measurement.



For more information, see

- www.ephy-mess.com
- Page 16/16

Principle of operation

When the temperature has reached the set upper limit value $\vartheta 1$, the K1 output relay changes its switching state after the configured time t has expired. The delay time can be adjusted. The K2 output relay responds in the same manner to the lower limit value of $\vartheta 2$.

The output relays return immediately to their original state (the RESET response is configured at Auto RESET) once the temperature reaches the respective hysteresis value.

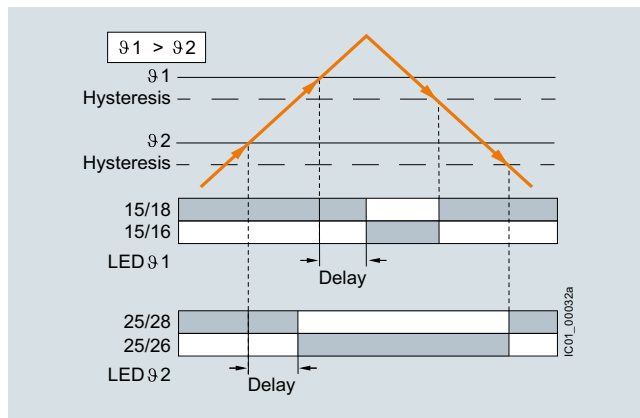
Both thresholds $\vartheta 1$ and $\vartheta 2$ can be parameterized for overshooting or undershooting. This makes it possible to use a limit value for issuing an alarm signal to announce that a limit value is about to be overshoot or undershot. The other limit value can be used for disconnection or to implement two-point or three-point control.

Note:

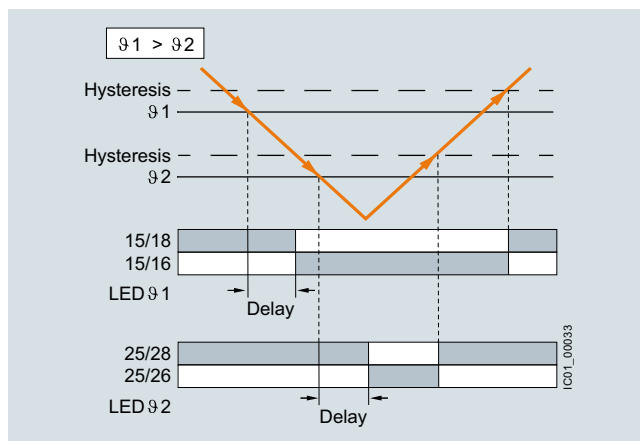
The "Temperature monitoring mode" parameter can be used to set the desired type of monitoring (monitoring for overshooting or undershooting or range monitoring).

With the closed-circuit principle selected

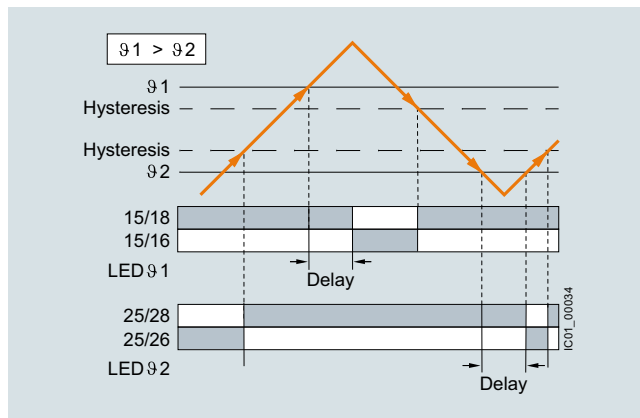
Temperature overshoot



Temperature undershoot



Range monitoring



Relays

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

General data

Memory function

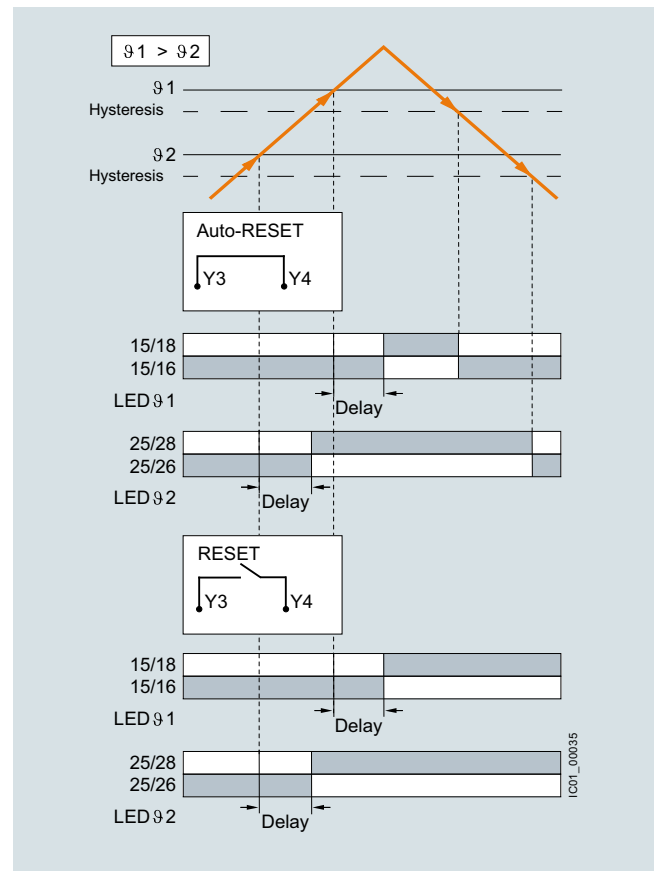
The digitally adjustable temperature monitoring relays for IO-Link have a memory function. The memory function is illustrated below by the example of a temperature overshoot.

When the temperature has reached the set limit value ϑ_1 , the output relay K1 changes its switching state after the configured time t has expired (output relay K2 responds to ϑ_2 in the same way).

The temperature monitoring relays for IO-Link respond as described below:

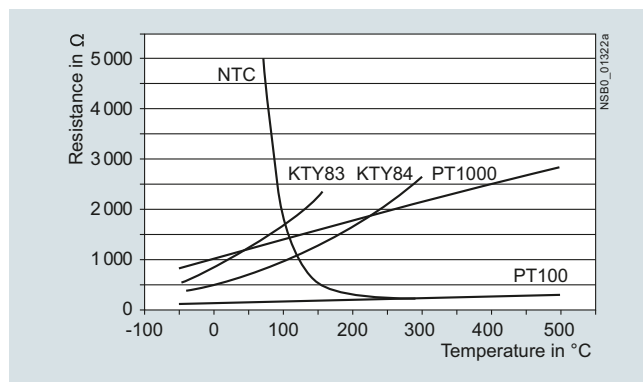
- With temperature monitoring relays for IO-Link the memory function is activated as standard (RESET). The output relays only return to the original state when the temperature falls below the set hysteresis value and when one of the following steps is performed:
 - Brief jumpering of the Y3/Y4 terminals
 - Set the rotary knob to "RUN" position and press the right-hand arrow key
 - Perform a RESET via IO-Link
- If the Y3/Y4 terminals are permanently jumpered, the memory function is deactivated (Auto RESET). The output relays return immediately to their original state once a previously occurred fault has been rectified and the temperature falls below the respective hysteresis value.

With the closed-circuit principle selected



Characteristic curves

For resistance sensors



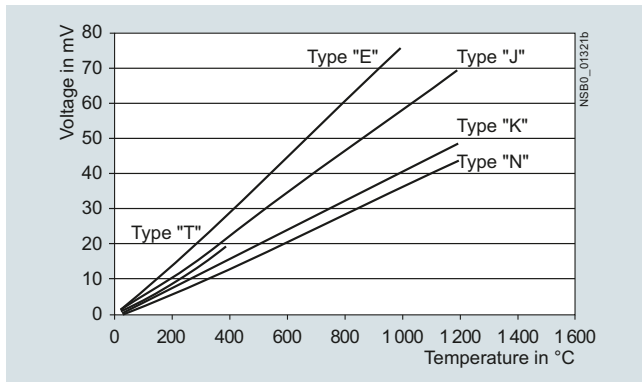
The short-circuit and open-circuit detection as well as the measuring range is limited, depending on the sensor type. Measuring ranges for resistance sensors

Sensor type	Short circuit	Open circuit	3RS1440, 3RS1441 Measuring range in $^{\circ}\text{C}$	Measuring range in $^{\circ}\text{F}$
Pt100	✓	✓	-50 ... +750	-58 ... +1 382
Pt1000	✓	✓	-50 ... +500	-58 ... +932
KTY83-110	✓	✓	-50 ... +175	-58 ... +347
KTY84	✓	✓	-40 ... +300	-40 ... +572
NTC ¹⁾	✓	--	+80 ... +160	+176 ... +320

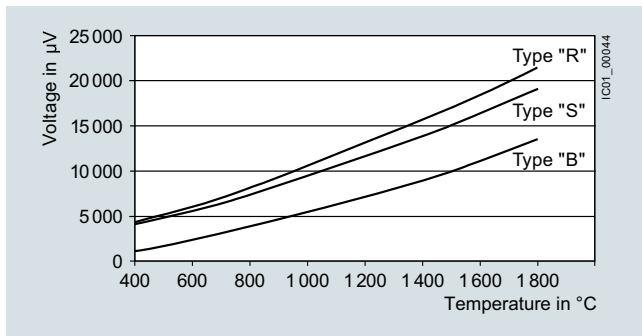
- ✓ Detection possible
- Detection not possible

¹⁾ NTC type: B57227-K333-A1 (100 $^{\circ}\text{C}$: 1.8 k Ω ; 25 $^{\circ}\text{C}$: 32.762 k Ω).

For thermocouples



Characteristic curves for sensor types K, N, J, E and T



Characteristic curves for sensor types S, R and B

Measuring ranges for thermocouples

Sensor type	Short circuit	Open circuit	3RS1540 Measuring range in °C	Measuring range in °F
K	--	✓	-99 ... +1 350	-146.2 ... +2 462
N	--	✓	-99 ... +1 300	-146.2 ... +2 372
J	--	✓	-99 ... +1 200	-146.2 ... +2 192
E	--	✓	-99 ... +999	-146.2 ... +1 830.2
T	--	✓	-99 ... +400	-146.2 ... +752
S	--	✓	0 ... 1 750	32 ... 3 182
R	--	✓	0 ... 1 750	32 ... 3 182
B	--	✓	400 ... 1 800	752 ... 3 272

✓ Detection possible

-- Detection not possible

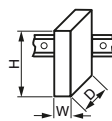
Type

3RS14,
3RS15

General technical specifications

Dimensions (W x H x D)

- Screw terminals
- Spring-type terminals



mm

mm

45 x 106 x 91

45 x 108 x 91

Permissible ambient temperature

- During operation

°C

-25 ... +60

Connection type

- Terminal screw
- Solid
- Finely stranded with end sleeve
- AWG cables, solid or stranded
- Tightening torque

mm²mm²

AWG

Nm



Screw terminals

M3 (for standard screwdriver, size 2 and Pozidriv 2)
 1 x (0.5 ... 4), 2 x (0.5 ... 2.5)
 1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)
 2 x (20 ... 14)
 0.8 ... 1.2

Connection type

- Solid
- Finely stranded, with end sleeve acc. to DIN 46228
- Finely stranded
- AWG cables, solid or stranded

mm²mm²mm²

AWG



Spring-type terminals

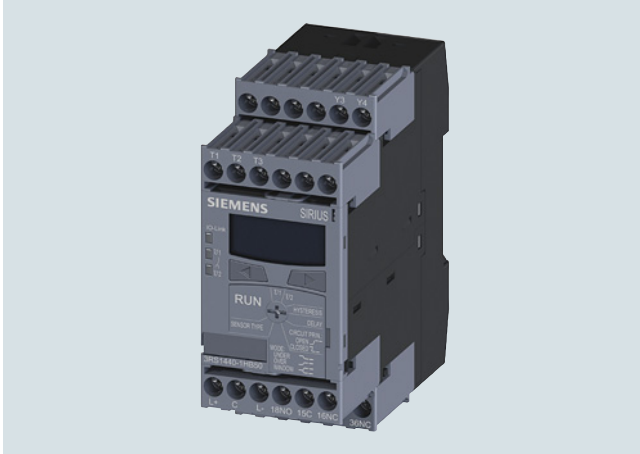
2 x (0.25 ... 1.5)
 2 x (0.25 ... 1.5)
 2 x (0.25 ... 1.5)
 2 x (24 ... 16)

Relays

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for 1 sensor

Overview



SIRIUS 3RS1440 digital monitoring relay for 1 sensor

The 3RS14 and 3RS15 temperature monitoring relays for IO-Link are used to measure temperatures in solid, liquid and gas media. The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored for overshooting or undershooting a working range (window function). The digital temperature monitoring relays have two separately adjustable limit values, are non-volatile and can be operated as desired using the open- or closed-circuit principle.

The devices differ in terms of the number of temperature sensors which can be evaluated. The 3RS1440 and 3RS1540 for IO-Link temperature monitoring relays can be digitally adjusted for one sensor and represent an alternative to temperature controllers in the low-end range (two-point or three-point control).

The devices with two-point control can, for example, be used as a thermostat. The devices with three-point control can, for example, independently switch between heating and cooling.

The 3RS1441 temperature monitoring relays for IO-Link can be digitally adjusted to evaluate up to three resistance sensors at one time. The devices were designed specifically for monitoring motor windings and positions.

The temperature monitoring relays are powered through the control supply voltages IO-Link (L+) and ground (L-) or via an external 24 V DC power supply.

Monitoring

When the temperature has reached the set limit value ϑ_1 , the output relay K1 changes its switching state after the configured time t has expired (output relay K2 responds to ϑ_2 in the same way). The delay time can be adjusted.

The output relays return immediately to their original state once the temperature reaches the respective hysteresis value.

When the temperature has reached the upper limit value ϑ_1 , the output relay K1 changes its switching state after the configured time t has expired. The output relay returns immediately to its original state once the temperature reaches the respective hysteresis value.

The K2 output relay responds in the same manner to the lower limit value of ϑ_2 . Both thresholds ϑ_1 and ϑ_2 can be parameterized for overshooting or undershooting. This makes it possible to use a limit value for issuing an alarm signal to announce that a limit value is about to be overshoot or undershot.

Note:

The "Temperature monitoring mode" parameter can be used to set the desired type of monitoring (monitoring for overshooting or undershooting or range monitoring).

Benefits

- Very simple operation without complicated menu selections
- Two- or three-point control can be parameterized quickly
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The temperature monitoring relays can be used in almost any application in which temperature overshoot or undershoot is not permitted, e.g. in the monitoring of set temperature limits and the output of alarm messages for:

- Plant and environment protection
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Temperature limits for district heating plants
- Exhaust temperature monitoring
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for 1 sensor

Technical specifications

Type		3RS1440	3RS1540
Auxiliary circuit			
Rated operational currents I_e			
• AC-15/24 ... 250 V	A	3	
• DC-13 at			
- 24 V	A	1	
- 125 V	A	0.2	
- 250 V	A	0.1	
Evaluation unit			
Measuring accuracy at 20 °C ambient temperature (T20)		< ± 2 K, ± 1 digit	< ± 5 K, ± 1 digit
Reference point accuracy		--	< ± 5 K
Deviations due to ambient temperature	%	0.05 °C per K deviation from T20	
In % of measuring range			
Measuring cycle	ms	500	
Hysteresis settings for temperature	K	1 ... 99, for both values	
Adjustable delay time	s	0 ... 999.9	
Sensor circuit			
Typical sensor current			
• Pt100	mA	1	--
• Pt1000/KTY83/KTY84/NTC	mA	0.2	--
Open-circuit detection		✓ ¹⁾	✓
Short-circuit detection		✓	--
Three-wire conductor connection		✓ ²⁾	--
Enclosure			
Rated insulation voltage U_i	V AC	300	
Pollution degree 2			

✓ Available

-- Not available

¹⁾ Not for NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).²⁾ Two-wire connection of resistance sensors with wire jumper between T2 and T3.

Relays

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for 1 sensor

Selection and ordering data

- To monitor temperatures with a resistance sensor or thermocouple
- Temperature range dependent on sensor type
- 99 to + 1 800 °C or - 146.2 to + 3 272 °F
- Short-circuit and open-circuit detection in sensor circuit
- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Overshoot, undershoot or range monitoring adjustable
- Exact sensor type can be set
- 2 limit values, can be adjusted separately
- Adjustable open-/closed-circuit principle
- Can be adjusted by Manual or remote RESET (via an external contact)
- Actual value, tripping state for control displayed and conveyed, adjustable in °C or °F
- 1 CO contact per limit value
- 1 CO contact for monitoring sensors and devices

PU (UNIT, SET, M) = 1
PS* = 1 unit
PG = 41H



3RS1440-1HB50



3RS1540-1HB80



3RS1440-2HB50



3RS1540-2HB80

Sensors	Measuring range (limit of measuring range dependent on sensor)	Adjustable hysteresis for $\varnothing 1$ and $\varnothing 2$	Tripping delay time adjustable for $\varnothing 1$ and $\varnothing 2$ DELAY	Supply voltage U_s	SD	Screw terminals		SD	Spring-type terminals	
		K	s	V DC	d	Article No.	Price per PU	d	Article No.	Price per PU
Temperature monitoring relay, digitally adjustable for a sensor, non-volatile fault storage can be selected										
Pt100/Pt1000, KTY83/KTY84, NTC (resistance sensor) ¹⁾	- 50 ... + 750 °C or - 58 ... + 1 382 °F	0 ... 99	0 ... + 999.9	24	2	3RS1440-1HB50	2		3RS1440-2HB50	
Type B, E, J, K, N, R, S, T (thermocouples)	- 99 ... + 1 800 °C or - 146.2 ... + 3 272 °F	0 ... 99	0 ... + 999.9	24	2	3RS1540-1HB80	2		3RS1540-2HB80	

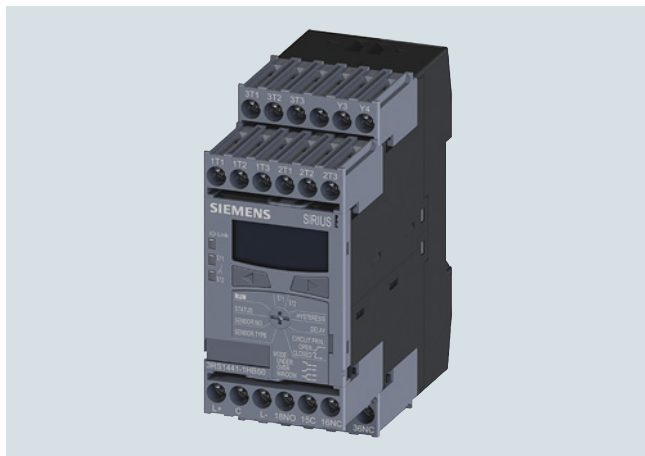
¹⁾ NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

For accessories, see page 10/153.

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for up to 3 sensors

Overview



SIRIUS 3RS1441 digital temperature monitoring relay for up to 3 sensors

The 3RS14 temperature monitoring relays can be used to measure temperatures in solid, liquid and gas media. The temperatures are acquired by means of sensors in the medium, evaluated by the device and monitored for overshooting or undershooting a working range (window function).

The devices can be parameterized to indicate the measured temperature in °C or °F. The 3RS1441 evaluation unit can evaluate up to 3 resistance sensors at the same time.

Benefits

- Very simple operation without complicated menu selections
- Space-saving with 45 mm width
- Two- or three-point control can be parameterized quickly
- All versions with removable terminals
- All versions with screw or spring-type terminals

Application

The 3RS1441 temperature monitoring relays can be used almost anywhere where several temperatures must be monitored at one time for overshooting, undershooting or staying within a certain range.

Monitoring of set temperature limits and output of alarm messages for:

- Plant and environment protection
- Temperature limits for process variables e.g. in the packaging industry or electroplating
- Controlling equipment and machines such as heating, climate and ventilation systems, solar collectors, heat pumps or warm water supplies
- Motor, bearing and gear oil monitoring
- Monitoring of coolants

Technical specifications

Type		3RS1441
Auxiliary circuit		
Rated operational currents I_e		
• AC-15/24 ... 250 V	A	3
• DC-13 at		
- 24 V	A	1
- 125 V	A	0.2
- 250 V	A	0.1
DIAZED fuse protection		
• Operational class gG	A	4
Evaluation unit		
Measuring accuracy at 20 °C ambient temperature (T20)		< ±2 K, ±1 digit
Deviations due to ambient temperature		%
In % of measuring range		0.05 per K deviation from T20
Measuring cycle	ms	500
Hysteresis settings for temperature 1	K	1 ... 99, for both values
Adjustable delay time	s	0 ... 999.9
Sensor circuit		
Typical sensor current		
• Pt100	mA	1
• Pt1000/KTY83/KTY84/NTC	mA	0.2
Open-circuit detection		✓ ¹⁾
Short-circuit detection		✓
Three-wire conductor connection		✓ ²⁾
Enclosure		
Rated insulation voltage U_i		V AC
Pollution degree 2		300

✓ Available

¹⁾ Not for NTC type B57227-K333-A1 (100 °C: 1.8 kΩ; 25 °C: 32.762 kΩ).

²⁾ Two-wire connection of resistance sensors with wire jumper between T2 and T3.

Relays

SIRIUS 3RS14, 3RS15 Temperature Monitoring Relays for IO-Link

Relays, digitally adjustable for up to 3 sensors

Selection and ordering data

- For temperature monitoring with up to 3 resistance sensors
- Temperature range dependent on sensor type
- 50 to + 750 °C or - 58 to + 1 382 °F
- Short-circuit and open-circuit detection in sensor circuit
- Adjustable via IO-Link and locally, with illuminated LCD
- Power supply with 24 V DC via IO-Link or external auxiliary voltage
- Overshoot, undershoot or range monitoring adjustable
- Exact sensor type and number of sensors can be set
- 2 limit values, can be adjusted separately
- Adjustable open-/closed-circuit principle
- Can be adjusted by manual or remote RESET (via an external contact)
- Actual value, tripping state for control displayed and conveyed, adjustable in °C or °F
- 1 CO contact per limit value
- 1 CO contact for monitoring sensors and devices



PU (UNIT, SET, M) = 1
PS* = 1 unit
PG = 41H



3RS1441-1HB50



3RS1441-2HB50

Sensors	Number of sensors that can be set	Measuring range (limit of measuring range dependent on sensor)	Adjustable hysteresis for $\varnothing 1$ and $\varnothing 2$	Tripping delay time adjustable for $\varnothing 1$ and $\varnothing 2$ DELAY	Supply voltage U_s	SD	Screw terminals		SD	Spring-type terminals	
			K	s	V DC	d	Article No.	Price per PU	d	Article No.	Price per PU

Temperature monitoring relay, digitally adjustable for up to 3 sensors, non-volatile fault storage can be selected

Sensors	Number of sensors that can be set	Measuring range (limit of measuring range dependent on sensor)	Adjustable hysteresis for $\varnothing 1$ and $\varnothing 2$	Tripping delay time adjustable for $\varnothing 1$ and $\varnothing 2$ DELAY	Supply voltage U_s	SD
Pt100/Pt1000, KTY83/KTY84, NTC (resistance sensor) ¹⁾	1 ... 3 sensors	-50 ... +750 °C or -58 ... +1 382 °F	0 ... 99	0 ... 999.9	24	2

3RS1441-1HB50

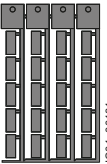



2

3RS1441-2HB50

¹⁾ NTC type: B57227-K333-A1 (100 °C: 1.8 k Ω ; 25 °C: 32.762 k Ω).

For accessories, see page 10/153.

Selection and ordering data

Use	Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
d							
Blank labels							
	For 3RS14 and 3RS15	Unit labeling plates For SIRIUS devices 20 mm x 7 mm, titanium gray ¹⁾	20	3RT2900-1SB20	100	340 units	41B
	For 3RS14 and 3RS15	Adhesive labels for SIRIUS devices					
		• 19 mm x 6 mm, pastel turquoise	15	3RT1900-1SB60	100	3 060 units	41B
		• 19 mm x 6 mm, zinc yellow	15	3RT1900-1SD60	100	3 060 units	41B
Push-in lugs and covers							
	For 3RS14 and 3RS15	Push-in lugs For screw fixing, 2 units are required for each device	5	3RP1903	1	10 units	41H
Tools for opening spring-type terminals							
	For auxiliary circuit connections	Screwdrivers For all SIRIUS devices with spring-type terminals	2	Spring-type terminals 	1	1 unit	41B
		3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated		3RA2908-1A			

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH, see page 16/16.

For matching sensors, see www.siemens.com/temperature.

Relays

SIRIUS 3RN2 thermistor motor protection

Overview



SIRIUS 3RN2 thermistor motor protection

More information

Homepage, see www.siemens.com/relays

Industry Mall, see www.siemens.com/product?3RN2

For the conversion tool, e.g. from 3RN1 to 3RN2, see www.siemens.com/sirius/conversion-tool

Thermistor motor protection devices are used for direct monitoring of the motor winding temperature. For this purpose, the motors are equipped with temperature-dependent resistors (PTC) that are directly installed in the motor winding and abruptly change their resistance at their temperature limit.

Versions

SIRIUS 3RN2 thermistor motor protection relays are available in the following versions:

- 3RN2000 compact evaluation unit
- 3RN2010 compact/standard evaluation unit
- 3RN2012-.BW31 bistable evaluation unit
- 3RN2011, 3RN2012-...30, 3RN2013 standard evaluation unit with ATEX approval
- 3RN2023 evaluation unit with ATEX approval and 2 sensor circuits for warning and disconnection

They comply with

- IEC 60947-8. Low-voltage switchgear and controlgear – Part 8: "Control units for built-in thermal protection (PTC) for rotating electrical machines"
- IEC 61000-6-2, IEC 61000-6-4. "Electromagnetic compatibility for industrial-process measurement and control equipment"

The 3RN2 thermistor motor protection relays with ATEX approval fulfill SIL1 in compliance with EN 50495.

The terminals of the auxiliary contacts are designated in accordance with EN 60947-1.

3RN2 evaluation units are suitable for snap-on mounting onto TH 35 standard mounting rails according to IEC 60715 or for screw fixing using an adapter (accessory).

Article No. scheme

Product versions		Article number					
Thermistor motor protection relay with PTC sensor, type A		3RN20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Number and version of the sensor circuits	1 sensor circuit, supply voltage = root voltage	0					
	1 sensor circuit	1					
	2 sensor circuits for warning and disconnection	2					
RESET	Auto RESET	0					
	Manual RESET, with open-circuit and short-circuit detection	1					
	Manual/Auto/remote RESET, non-volatile, with open-circuit and short-circuit detection	2					
	Manual/Auto/remote RESET, non-volatile, with open-circuit and short-circuit detection, with protective separation	3					
Connection method	Screw terminals	1					
	Spring-type terminals (push-in)	2					
Auxiliary switches	1 CO	A					
	2 CO	B					
	1 NO + 1 NC	C					
	1 NO + 1 CO	D					
	2 CO, hard gold-plated	G					
Rated control supply voltage	24 V AC/DC	A 3					
	24 ... 240 V AC/DC	W 3					
Response to failure	Monostable	0					
	Bistable	1					
Example		3RN20	0	0	–	1	A A 3 0

Note:

The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

SIRIUS 3RN2 thermistor motor protection

Benefits

- Thanks to direct motor protection, overdimensioning of the motors is not necessary
- No settings on the device are necessary
- Semiconductor compatible output thanks to versions with hard gold-plated contacts

- Rapid error diagnosis thanks to versions that indicate open and short circuits in the sensor circuit
- All versions with removable terminals
- All versions with screw or spring-type terminals with push-in functionality

Application

Direct motor protection through temperature monitoring of the motor winding offers 100% motor protection even under the most difficult ambient conditions, without the need to make adjustments on the device. Versions with hard gold-plated contacts ensure, in addition, a high switching reliability that is even higher than an electronic control.

Direct motor protection

- At increased ambient temperatures
- When switching frequency is too high
- When start up and braking procedures are too long

ATEX approval for operation in hazardous areas

The SIRIUS 3RN2011, 3RN2012-...30, 3RN2013 and 3RN2023 thermistor motor protection relays for PTC sensors are certified according to ATEX Ex II (2) G and D for environments with explosive gas or dust loads.

Motor protection using current- and temperature-dependent protective devices

IEC 60204 stipulates that motors must be protected from overheating at a rating of 0.5 kW and higher. The protection can take the form of overload protection, overtemperature protection or current limiting.

For motors with frequent starting and braking and in environments where cooling may be impaired (e.g. by dust), it is recommended to use the overtemperature protection option in the form of a protective device coordinated with this mode of operation. A good choice in this case is the use of 3RN2 thermistor motor protection devices.

On rotor-critical motors, overtemperature detection in the stator windings can lead to delayed and hence inadequate protection. In this case the standards stipulate additional protection, e.g. by means of an overload relay.

This combination of thermistor motor protection and an overload relay is recommended for full motor protection in case of frequent starting and braking of motors, irregular intermittent duty or excessive switching frequency. To prevent premature tripping of the overload relay in such operating conditions, a higher setting than that normally required for the operational current is chosen. The overload relay then performs stall protection, and the 3RN2 thermistor motor protection relay monitors the temperature of the motor windings.

Application	Motor protection		
	Only current dependent, e.g. with overload relay	Temperature dependent only, e.g. with thermistor motor protection relay	Current and temperature dependent
Motor protection in case of			
Overloading in uninterrupted duty	✓	✓	✓
Long start up and braking operations	○	✓	✓
Irregular intermittent duty	○	✓	✓
Excessively high switching frequency	○	✓	✓
Single-phase operation and current unbalance	✓	✓	✓
Voltage and frequency fluctuations	✓	✓	✓
Stalling of the rotor	✓	✓	✓
Switching on a stalled rotor of a stator-critical motor	✓	✓	✓
Switching on a stalled rotor of a rotor-critical motor	✓	○	✓
Elevated ambient temperature	--	✓	✓
Impeded cooling	--	✓	✓

- ✓ Full protection
- Conditional protection
- No protection

Relays

SIRIUS 3RN2 thermistor motor protection

Technical specifications

More information

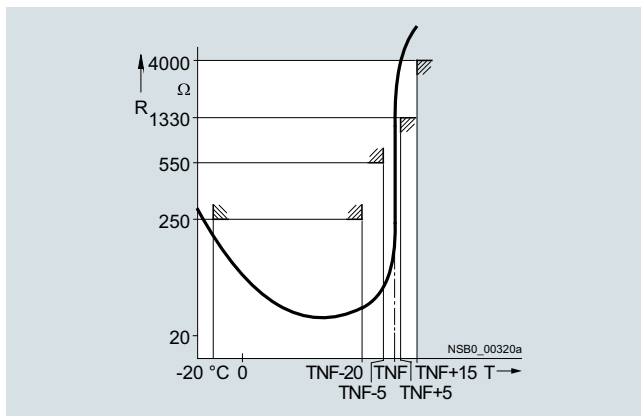
Technical specifications, see
<https://support.industry.siemens.com/cs/ww/en/ps/24302/td>
 Operating instructions and internal circuit diagrams, see
<https://support.industry.siemens.com/cs/ww/en/ps/24302/man>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/24302/faq>
 For more information on explosion protection (ATEX), see
www.siemens.com/sirius/atex

Type A PTC temperature sensor

If a Type A temperature sensor is connected to a Type A evaluation unit, compliance with the operating temperatures is assured (on pick-up and reset) according to IEC 60947-8.

The characteristic curves of the Type A temperature sensors are described in IEC 60947-8, EN 44081 and EN 44082 standards.



Characteristic curve of the 3RN2 evaluation unit

Bimetallic switch

In some applications, bimetallic switches (e.g. Klixon, Thermo-click) are used as sensors instead of PTC temperature sensors. Bimetallic switches are temperature- and current-dependent NC contacts and are available for different temperature ranges. Because bimetallic switches have practically no resistance below their opening temperature, short-circuit detection is not possible when using bimetallic switches. A bimetallic switch can be used for versions 3RN2000 and 3RN2010 on the SIRIUS thermistor motor protection relay.

Note:

Never use bimetallic switches in applications subject to an explosion hazard! Because of their non-standardized tripping characteristic, bimetallic switches must not be used in applications where there is an explosion hazard. Use Type A PTC sensors instead!

Use in hazardous areas

Increased danger in hazardous areas means it is necessary to observe the following notes and standards carefully:

- EN 60079-14/VDE 0165-1 for electrical apparatus for explosive gas atmospheres
- EN 60079-17 Explosive atmospheres – Electrical installations inspection and maintenance
- EN 50495 Safety devices required for the safe functioning of equipment with respect to explosion risks

The following SIRIUS 3RN2 thermistor motor protection relays with short-circuit detection are approved for Equipment Group II, Category (2) in Area "G" (areas in which potentially explosive gas, vapor, mist, or air mixtures are present) and are additionally approved for Area "D" (areas containing combustible dust):

- 3RN2011
- 3RN2012-...30
- 3RN2013
- 3RN2023

PTB 15 ATEX 3011 ex II (2) G (Ex E) (Ex d) (Ex px)

PTB 15 ATEX 3011 ex II (2) D (Ex t) (Ex p)

For 3RN2 thermistor motor protection relays, the EC type examination certificate is available for Group II, Category (2) G [Ex e] [Ex d] [Ex px] and D [Ex t] [Ex p]. The number is PTB 15 ATEX 3011.

SIRIUS 3RN2 thermistor motor protection relays are not intended for installation in hazardous areas. If they are installed in a potentially explosive atmosphere, the SIRIUS 3RN2 thermistor motor protection relays must be adapted to the applicable type of protection.

The machine or plant must shut down immediately if the SIRIUS 3RN2 thermistor motor protection relay is tripped, even if connected through a frequency converter. This must be implemented with circuitry.

SIRIUS 3RN2 thermistor motor protection relays with functional safety in accordance with EN 50495 are suitable for protecting explosion-proof motors/machines.

On evaluation units with a supply voltage of 24 V AC/DC, you must ensure electrical separation with a battery network or a power supply unit with electrical separation (e.g. isolating transformer) (does not apply to 3RN2013-.BA30).

A SIRIUS 3RN2 thermistor motor protection relay set to "automatic RESET" mode will be reset automatically after the recovery time has elapsed, without the RESET button being pressed. An additional ON button has to be used to ensure that the motor does not start up automatically following tripping. "Automatic RESET" mode must not be used in applications where there is a risk of personal injury or damage to property if the motor restarts unexpectedly.

SIRIUS 3RN2 thermistor motor protection

⚠ NOTICE!

When used in a hazardous area, the thermistor motor protection relay must not be operated with automatic RESET (terminal Y1 and Y2 permanently jumpered).

A risk analysis must be performed for the complete plant or machine. If this analysis yields a lower hazard potential (Category 1), all SIRIUS 3RN2 thermistor motor protection relays can be used, provided the safety regulations are observed.

⚠ WARNING!

All work involved in connecting, commissioning and maintenance must be carried out by qualified, responsible personnel. Improper handling may result in serious personal injury and considerable damage to property.

Cable routing

The measuring circuit leads must be routed as separate control cables. It is not permitted to use cores from the supply line of the motor or any other main supply cables. If extreme inductive or capacitive interference is expected as a result of power lines routed in parallel, shielded control cables must be used.

Maximum length of sensor circuit cables for evaluation units without short-circuit detection in the sensor circuit:

Cable cross-section	3RN2000, 3RN2010
2.5 mm ²	2 x 2 800 m
1.5 mm ²	2 x 1 500 m
0.5 mm ²	2 x 500 m

Maximum length of sensor circuit cables for evaluation units with short-circuit detection ¹⁾

Cable cross-section	3RN2011, 3RN2012, 3RN2013, 3RN2023
2.5 mm ²	2 x 250 m
1.5 mm ²	2 x 150 m
0.5 mm ²	2 x 50 m

¹⁾ A short circuit in the sensor circuit will be detected up to this maximum cable length.

Principle of operation

SIRIUS 3RN2 thermistor motor protection relays are thermal protection devices that are suitable, in combination with Type A PTC thermistors, for monitoring temperatures of electrical drives, transformer windings, oils, bearings, air, etc.

The most frequent application is monitoring of three-phase motors in which the motor manufacturer has fitted a PTC sensor into every winding overhang and in which these PTC sensors are connected in series.

The SIRIUS 3RN2 thermistor motor protection relays operate in accordance with the closed-circuit principle and therefore monitor themselves for loss of supply voltage. The exceptions are the warning output on 3RN2023, which always works on the open-circuit principle and the bistable relays of the 3RN2012-BW31, which always retain the last switching state.

A micro-interruption in the power supply of less than 30 ms does not change the status of the output relays.

For devices with the "Manual RESET" function, the test function can be activated and a trip simulated by pressing the blue Test/RESET button for > 2 seconds.

The 3RN2011, 3RN2012, 3RN2013 and 3RN2023 devices are additionally equipped with open-circuit and short-circuit detection in the sensor circuit. The unit will trip in the event of a short circuit (resistance in sensor circuit < 10 Ω) or open circuit in the sensor circuit (dynamic open-circuit detection). Tripping as the result of a short circuit in the sensor circuit is indicated by a flickering red LED (TRIPPED). In the event of a short circuit in the sensor circuit for warning on the 3RN2023, the yellow warning LED (WARNING) flickers. The devices with dynamic open-circuit detection evaluate the rise time of the sensor circuit resistance. If the sensor circuit resistance rises from 3 300 Ω to 12 kΩ within 200 ms, the unit will not only trip, but also indicate the open circuit via a flashing red LED (TRIPPED). In the event of an open circuit in a sensor circuit, the yellow warning LED (WARNING) flashes for the 3RN2023.

All evaluation units (except for the 3RN2000 compact evaluation unit) feature electrical separation between the control circuit and the sensor circuit. The relay outputs are also electrically separated from all other circuits. The 3RN2013 and 3RN2023 evaluation units incorporate protective electrical separation between all circuits up to $U_i = 300$ V.

3RN2000 compact evaluation unit

The compact unit, which is only 17.5 mm wide, is equipped with a red LED (TRIPPED) for the tripped indicator and a changeover contact. After the unit has tripped, it is automatically reset once the thermistors have cooled down. The root of the changeover contact is connected to the control voltage (terminal 11 is connected to terminal A1). This unit is particularly suitable in circuits in which the control circuit and signaling circuit have the same potential, e.g. in local control boxes.

3RN2010, 3RN2011, 3RN2012 and 3RN2013 compact/standard evaluation units

The units are equipped with two LEDs (READY and TRIPPED) for an operating and tripped display and are available with either 1 NO + 1 NC contacts (3RN2010, overall width 17.5 mm) or with 2 CO contacts. Depending on the version, they are available with Auto RESET (3RN2010), Manual/remote RESET (3RN2011) or Manual/Auto and remote RESET (3RN2012 and 3RN2013). Remote RESET can be achieved by connecting an external pushbutton with a normally-open function to terminals Y1 and Y2. If terminals Y1 and Y2 are jumpered, the unit is automatically reset once the thermistors have cooled down (Auto RESET). 3RN2012 and 3RN2013 are non-volatile. This means a previous trip remains stored in the event of a control supply voltage failure – the thermistor motor protection relay remains in the safe state with an opened output relay until it is intentionally reset by pressing the TEST/RESET button of the unit or an external pushbutton.

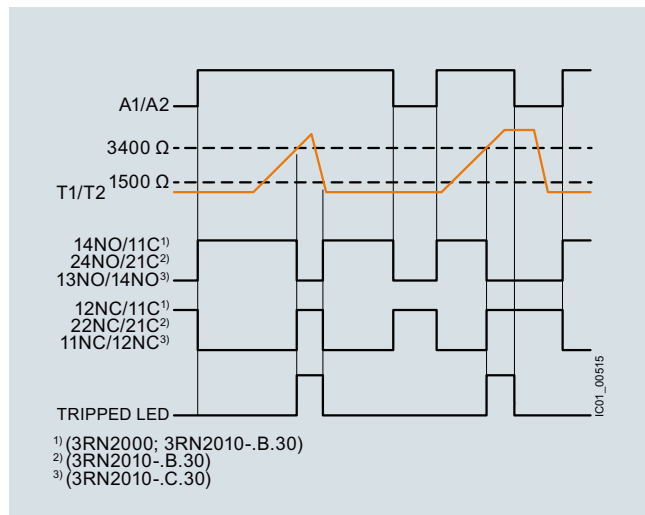
3RN2023 "warning and disconnection" evaluation units

Two sensor circuits can be connected to one 3RN2023 evaluation unit that act on two separate output relays with 1 NO contact for warning and 1 CO contact for disconnection. Thermistors with different rated response temperatures TNF are used to implement the "Warning" and "Disconnection" functions. When sensor circuit 2 for "Warning" responds, a yellow LED is lit and when the "Disconnection" circuit responds, a red LED is lit. The sensor circuits have a different reset response and operating behavior: The "Warning" thermistor sensor circuit 2 (terminals 2T1, T2) works only with Auto RESET and according to the open-circuit principle (output relay K2, NO contact). The "Disconnection" thermistor sensor circuit 1 (terminals 1T1, T2) can be changed from Manual RESET to Auto RESET by jumpering terminals Y1 and Y2. Remote RESET is implemented by connecting an external pushbutton with a normally-open function to these terminals.

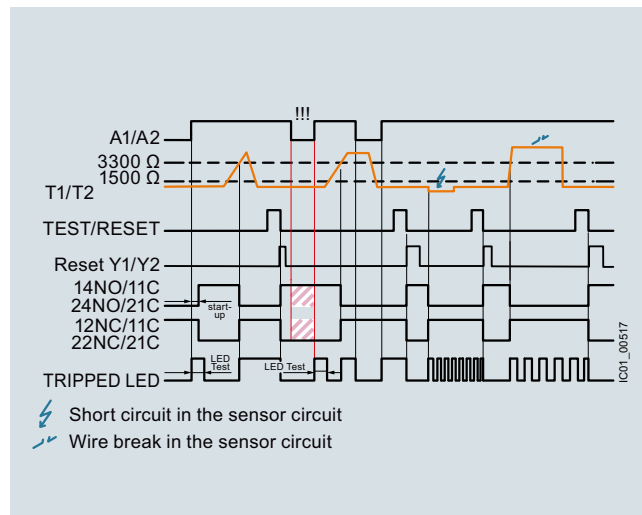
Relays

SIRIUS 3RN2 thermistor motor protection

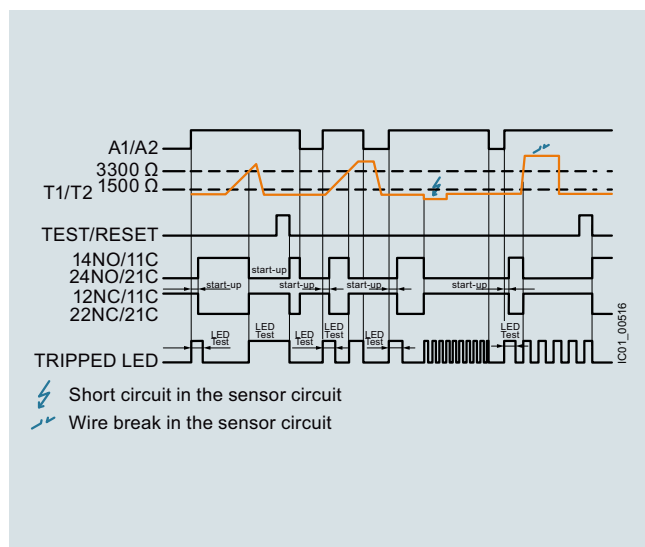
Function diagrams



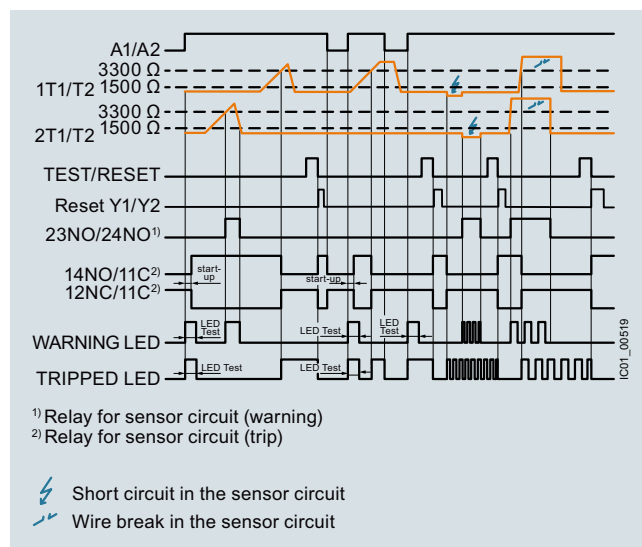
3RN2000, 3RN2010



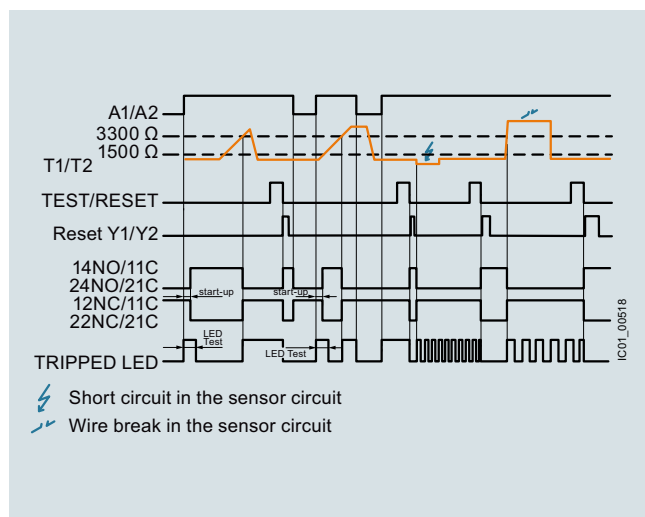
3RN2012-BW31: resetting via the TEST/RESET button or external pushbutton



3RN2011: resetting via external pushbutton or interruption of the supply voltage



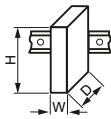
3RN2023: resetting via the TEST/RESET button or external pushbutton



3RN2012-B.30, 3RN2013: resetting via the TEST/RESET button or external pushbutton

SIRIUS 3RN2 thermistor motor protection

Article number	3RN2000-A, 3RN2010-C	3RN201-.B, 3RN2013-G, 3RN2023-D
Width x height x depth	17.5 x 100 x 90	22.5 x 100 x 90





Article number	3RN2000- .AA30	3RN2000- .AW30, 3RN2010- .BW30, 3RN2010- .CW30	3RN2010- .BA30, 3RN2010- .CA30	3RN2011- .BA30, 3RN2012- .BA30	3RN2011- .BW30, 3RN2012- .BW30	3RN2012- .BW31	3RN2013- .BA30	3RN2013- .BW30, 3RN2013- .GW30	3RN2023- .DW30
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General technical specifications:									
Type of electrical isolation		None	Isolated					Protective separation	
Electrical endurance (operating cycles) for AC-15 at 230 V		100 000							
Mechanical endurance (operating cycles)		10 000 000							
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value	V	300							
Impulse withstand voltage, rated value	kV	4					6		
Minimum mains failure buffering time	ms	40							30
Pollution degree		3							
Degree of protection		IP20							
Shock resistance acc. to IEC 60068-2-27		11g/15 ms							
Vibration resistance acc. to IEC 60068-2-6		10 ... 55 Hz: 0.35 mm							
Type of mounting		For screw-fixing and snap-on mounting to 35 mm standard mounting rail							
• Mounting position		Any							
• Installation altitude at height above sea level, maximum	m	2 000							
Ambient temperature during operation	°C	-25 ... +60							
Relative humidity during operation, maximum	%	70							
ATEX									
Ex device group and Ex category according to ATEX product directive 2014/34/EU		--		II 2G, II 2D		--		II 2G, II 2D	
Safety device type according to IEC 61508-2		--		Type B		--		Type B	
Safety integrity level (SIL) according to IEC 61508		--		SIL1		--		SIL1	
Performance level (PL) according to EN ISO 13849-1		--		c		--		c	
T1 value for proof test interval or service duration according to IEC 61508	y	--		3		--		3	
Measuring circuit:									
Number of measuring circuits		1						2	
Relative measuring accuracy	%	9		2					
Maximum number of sensors in series		6							
Cable length of sensor, maximum	m	2 800		250					
Thermistor resistance response value	Ω	1 500 ... 1 650		1 500 ... 1 550					
Thermistor resistance return value	Ω	3 400 ... 3 600		3 300 ... 3 350					

Relays

SIRIUS 3RN2 thermistor motor protection

Article number		3RN2000- .AA30	3RN2000- .AW30, 3RN2010- .BW30, 3RN2010- .CW30	3RN2010- .BA30, 3RN2010- .CA30	3RN2011- .BA30, 3RN2012- .BA30	3RN2011- .BW30, 3RN2012- .BW30	3RN2012- .BW31	3RN2013- .BA30	3RN2013- .BW30, 3RN2013- .GW30	3RN2023- .DW30
Control circuit:										
Current carrying capacity of the output relay										
• At AC-15 at 250 V at 50/60 Hz	A	3								
• At DC-13 at 24 V	A	1								
• At DC-13 at 125 V	A	0.2								
• At DC-13 at 250 V	A	0.1								
Thermal current of the non-solid-state contact blocks, maximum	A	5								
Continuous current of the output relay's DIAZED fuse link	A	6								
Supply voltage:										
Control supply voltage										
• At AC										
- At 50 Hz rated value	V	24 ... 24	24 ... 240	24 ... 24		24 ... 240		24 ... 24	24 ... 240	
- At 60 Hz rated value	V	24 ... 24	24 ... 240	24 ... 24		24 ... 240		24 ... 24	24 ... 240	
• At DC, rated value	V	24 ... 24	24 ... 240	24 ... 24		24 ... 240		24 ... 24	24 ... 240	
Operating range factor of the control supply voltage, rated value										
• At AC at 50 Hz		0.85 ... 1.1								
• At AC at 60 Hz		0.85 ... 1.1								
• At DC		0.85 ... 1.1								

Article number		3RN20..-1	3RN20..-2
Type of electrical connection		 Screw terminals	 Spring-type terminals (push-in)
Tightening torque	Nm	0.6 ... 0.8	--
Type of connectable conductor cross-sections			
• Solid	mm ²	1x (0.5 ... 4.0 mm ²), 2x (0.5 ... 2.5 mm ²)	1x (0.5 ... 4 mm ²)
• Finely stranded with end sleeve	mm ²	1x (0.5 ... 4 mm ²), 2x (0.5 ... 1.5 mm ²)	1x (0.5 ... 2.5 mm ²)
• For AWG cables			
- Solid	AWG	1x (20 ... 12), 2x (20 ... 14)	1x (20 ... 12)
- Stranded	AWG	--	1x (20 ... 12)

SIRIUS 3RN2 thermistor motor protection

Selection and ordering data



3RN2000-1AA30



3RN2010-1BA30



3RN2011-1BA30



3RN2012-1BW30



3RN2023-1DW30

Product function	Number of CO contacts for auxiliary contacts	Number of NO contacts for auxiliary contacts	Number of NC contacts for auxiliary contacts	Material of switching contacts	Control supply voltage At AC at 50 Hz rated value	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
					V	V	d				

Compact evaluation unit, suitable for bimetallic switch

Terminal A1 jumpered with root of changeover contact

Auto RESET	1	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2000-□AA30	1	1 unit	41H
					24 ... 240	24 ... 240	2	3RN2000-□AW30	1	1 unit	41H
	0	1	1	AgSnO2	24 ... 24	24 ... 24	2	3RN2010-□CA30	1	1 unit	41H
					24 ... 240	24 ... 240	2	3RN2010-□CW30	1	1 unit	41H

Standard evaluation unit, suitable for bimetallic switch

Auto RESET	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2010-□BA30	1	1 unit	41H
					24 ... 240	24 ... 240	2	3RN2010-□BW30	1	1 unit	41H

Bistable evaluation unit, open-circuit and short-circuit detection in the sensor circuit

Does not trigger in the event of control supply voltage failure

Auto RESET	2	0	0	AgSnO2	24 ... 240	24 ... 240	2	3RN2012-□BW31	1	1 unit	41H
Manual RESET											
External RESET											
Error memory											

Standard evaluation unit with ATEX approval, open-circuit and short-circuit detection in the sensor circuit¹⁾

Manual RESET	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2011-□BA30	1	1 unit	41H
External RESET					24 ... 240	24 ... 240	2	3RN2011-□BW30	1	1 unit	41H

Non-volatile³⁾

Auto RESET	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2012-□BA30	1	1 unit	41H
Manual RESET					24 ... 240	24 ... 240	2	3RN2012-□BW30	1	1 unit	41H
External RESET											
Error memory											

Protective separation, non-volatile^{2,3)}

Auto RESET	2	0	0	AgSnO2	24 ... 24	24 ... 24	2	3RN2013-□BA30	1	1 unit	41H
Manual RESET					24 ... 240	24 ... 240	2	3RN2013-□BW30	1	1 unit	41H
External RESET											
Error memory				AgSnO2 Hard gold-plated	24 ... 240	24 ... 240	2	3RN2013-□GW30	1	1 unit	41H

Evaluation unit with ATEX approval and 2 sensor circuits for warning and disconnection, open-circuit and short-circuit detection in both sensor circuits

Protective separation, non-volatile^{2,3)}

Auto RESET	1	1	0	AgSnO2	24 ... 240	24 ... 240	2	3RN2023-□DW30	1	1 unit	41H
Manual RESET											
External RESET											
Error memory											

Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

¹⁾ For 3RN2011: The unit can be reset with the RESET button or by disconnecting the control supply voltage.









²⁾ Protective separation up to 300 V acc. to DIN/VDE 0160, IEC 60947-1.

³⁾ Protection against voltage failure or non-volatile fault storage means that previous tripping due to a fault remains stored even if the control supply voltage fails. The monitoring device is not reset if the voltage fails. With an active fault, meaning a fault which has not been manually confirmed, an automatic restart of the plant upon recovery of the power is prevented therefore and plant safety increased as the result.

Relays

SIRIUS 3RN2 thermistor motor protection

Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Terminals for SIRIUS devices in the industrial standard mounting rail enclosure						
 3ZY1122-1BA00	Removable terminals • 2-pole, up to 1 x 4 mm ² or 2 x 2.5 mm ²	2	Screw terminals  3ZY1122-1BA00	1	6 units	41L
	• 2-pole, up to 1 x 4 mm ² or 2 x 1.5 mm ²	2	Spring-type terminals (push-in)  3ZY1122-2BA00	1	6 units	41L
Accessories for enclosures						
 3ZY1311-0AA00	Push-in lugs For wall mounting	2	3ZY1311-0AA00	1	10 units	41L
 3ZY1440-1AA00	Coding pins For removable terminals of SIRIUS devices in the industrial standard mounting rail enclosure; they enable the mechanical coding of terminals	2	3ZY1440-1AA00	1	12 units	41L
 3ZY1450-1AB00	Hinged cover NEW Replacement cover, without terminal labeling, titanium gray • 17.5 mm wide	2	3ZY1450-1AA00	1	5 units	41H
	• 22.5 mm wide	2	3ZY1450-1AB00	1	5 units	41H
Tools for opening spring-type terminals						
 3RA2908-1A	Screwdrivers For all SIRIUS devices with spring-type terminals 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated	2	Spring-type terminals (push-in)  3RA2908-1A	1	1 unit	41B

Overview



SIRIUS 3RS70 signal converters

More information

Homepage, see www.siemens.com/relaysIndustry Mall, see www.siemens.com/product?3RS70For the conversion tool, e.g. from 3RS17 to 3RS70, see www.siemens.com/sirius/conversion-tool

Signal converters perform the coupling function for analog signals on both the input side and the output side. They are indispensable when processing analog values with electronic controls. Under harsh industrial conditions in particular, it is often necessary to transmit analog signals over long distances. Electrical separation is then needed as a result of the different power supplies. The resistance of the wiring causes potential differences and losses which must be prevented.

Electromagnetic disturbance and overvoltages can affect the signals on the input side in particular or even destroy the analog modules. All terminals of the 3RS70 signal converters are safe up to a voltage of 30 V DC and protected against switching poles. Short-circuit protection is an especially important function for the outputs.

The devices are EMC-tested according to

- IEC 61000-6-4 (generic standard for emitted interference)
- IEC 61000-6-2 (generic standard for interference immunity)

The analog signals comply with

- IEC 60381-1/2

Article No. scheme

Product versions		Article number	
Signal converters		3RS70	□ □ – □ □ □ 0 0
Product function/type of input signal	Single-range converters, active	0 0	3-way separation, input 0 ... 10 V
		0 2	3-way separation, input 0 ... 20 mA,
		0 3	3-way separation, input 4 ... 20 mA,
	Switchable multi-range converters, active	0 5	3-way separation, 3 standard signals can be switched 0 ... 10 V, 0/4 ... 20 mA
	Switchable universal converters, active	0 6	3-way separation, 16 signals can be switched
	Single-range converters, passive	2 0	2-way separation, 4 ... 20 mA
	Switchable multi-range converters, active	2 5	3-way separation, with manual/automatic switch and setting potentiometer
Connection type	Screw terminals	1	
	Spring-type terminals (push-in)	2	
Type of output signal	0 ... 10 V	A	
	0 ... 20 mA	C	
	4 ... 20 mA	D	
	Loop power isolator 4 ... 20 mA	E	
	3 standard signals can be switched	F	
	4 frequencies can be switched	K	
Supply voltage	24 V AC/DC	E	
	None	T	
	24 ... 240 V AC/DC	W	
Example		3RS70	0 0 – 1 A E 0 0

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Relays

Coupling Relays and Signal Converters/Interface Converters

SIRIUS 3RS70 signal converters

Benefits

- Narrow width
- Easy-to-set universal converters
- Converters with frequency output
- All ranges are fully calibrated
- Universal family of devices – the perfect solution for every application
- Integrated manual/automatic switch with a setpoint generator
- Outputs are short-circuit-proof
- Up to 30 V – protected against damage caused by wiring errors

Application

Signal converters are used in analog signal processing for

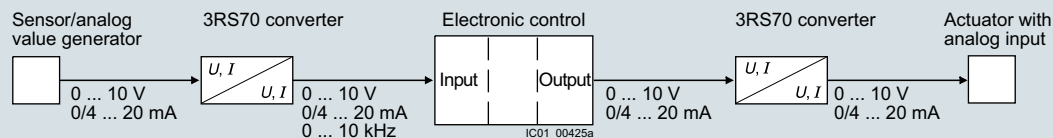
- Electrical separation
- Conversion of normalized and non-normalized signals
- Amplification and impedance adaptation
- Conversion to a frequency for processing by a digital input
- Overvoltage and EMC protection
- Short-circuit protection of the outputs

3RS7025 manual/automatic converter

For special applications in which analog signals have to be simulated, or during plant commissioning when the actual process value is not yet available, the 3RS7025 devices feature an adjustable potentiometer for manual setpoint selection and a manual/automatic switch.

The potentiometer for the 3RS7025 devices is used to simulate analog output signals when the changeover switch is set to "Manual" and the control supply voltage is applied, without the need for an analog input signal. The scale ranges from 0 ... 100%.

Example: When it is set for an output of 4 ... 20 mA, the left stop on the potentiometer represents an output current of 4 mA and the right stop represents an output current of 20 mA. In the "Auto" switch position, the output signal follows the input signal proportionally regardless of the potentiometer setting.



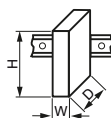
Application example of analog signal processing

Technical specifications

More information

Technical specifications, see
<https://support.industry.siemens.com/cs/ww/en/ps/16691/td>
 Operating instructions, see
<https://support.industry.siemens.com/cs/ww/en/view/109475738>

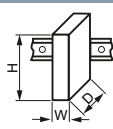
Circuit diagrams, see
<https://support.industry.siemens.com/cs/ww/en/view/109475738>

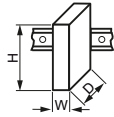
Article number	3RS7000-.AE00		3RS7002-.AE00, 3RS7003-.AE00	3RS7000-.CE00, 3RS7000-.DE00	3RS7002-.CE00, 3RS7002-.DE00, 3RS7003-.CE00, 3RS7003-.DE00	3RS7020-.ET00
Product designation Product version	Single-range converters, active					Single-range converters, passive
General data:						
Width x height x depth	 mm	6.2 × 93 × 72.5				6.2 × 93 × 71
Ambient temperature						
• During operation	°C	-25 ... +60				
• During storage	°C	-40 ... +80				
Relative humidity during operation	%	10 ... 95				
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value	V	50				
Active power input	W	0.29				--
Degree of protection	IP20					
Input:						
Input voltage						
• Max.	V	30				
Input impedance						
• Of current input, maximum	Ω	--	100	--	100	
• Of voltage input, minimum	kΩ	330	--	330	--	
Output:						
Load						
• Maximum at current output	Ω	--		500		1 000
• Minimum at voltage output	kΩ	2		--		--
Relative measuring accuracy	%	0.1				
Short-circuit-proof		Yes				No



Relays

Coupling Relays and Signal Converters/Interface Converters

SIRIUS 3RS70 signal converters

Article number		3RS7005- .FE00	3RS7005- .KE00	3RS7005- .FW00	3RS7005- .KW00	3RS7025- .FE00	3RS7025- .FW00
Product designation Product version		Switchable multi-range converters, active				Switchable multi-range converters, active, with manual/automatic switch and setting potentiometer	
General data:							
Width x height x depth	 mm	6.2 × 93 × 72.5		17.5 × 93 × 72.5		17.5 × 93 × 75	
Ambient temperature							
• During operation	°C	-25 ... +60					
• During storage	°C	-40 ... +80					
Relative humidity during operation	%	10 ... 95					
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value	V	50		300		50	300
Active power input	W	0.29		0.5	0.34	0.5	
Degree of protection		IP20					
Input:							
Input voltage							
• Max.	V	30					
Input impedance							
• Of current input, maximum	Ω	100					
• Of voltage input, minimum	kΩ	330					
Output:							
Load							
• Maximum at current output	Ω	500	--	500	--	500	
• Minimum at voltage output	kΩ	2	--	2	--	2	
Relative measuring accuracy	%	0.1					
Short-circuit-proof		Yes					

Article number		3RS7006-.FE00		3RS7006-.FW00	
Product designation		Switchable universal converters, active			
Product version					
General data:					
Width x height x depth			mm	17.5 × 93 × 72.5	
Ambient temperature					
• During operation		°C	-25 ... +60		
• During storage		°C	-40 ... +80		
Relative humidity during operation		%	10 ... 95		
Insulation voltage for overvoltage category III to IEC 60664 for pollution degree 3 rated value		V	50		300
Active power input		W	0.5		
Degree of protection		IP20			
Input:					
Input voltage					
• Max.		V	30		
Input impedance					
• Of current input, maximum		Ω	100		
• Of voltage input, minimum		kΩ	330		
Output:					
Load					
• Maximum at current output		Ω	500		
• Minimum at voltage output		kΩ	2		
Relative measuring accuracy		%	0.1		
Short-circuit-proof			Yes		

Article number	3RS70..-1....	3RS70..-2....
Type of electrical connection	 Screw terminals	 Spring-type terminals (push-in)
Type of connectable conductor cross-sections		
• Solid	1x (0.25 ... 2.5 mm²)	1x (0.25 ... 2.5 mm²)
• Finely stranded		
- Without end sleeves	--	1x (0.25 ... 2.5 mm²)
- With end sleeves	1x (0.25 ... 1.5 mm²)	1x (0.25 ... 1.5 mm²)
• Solid for AWG cables	1x (20 ... 14)	1x (20 ... 14)

Relays

Coupling Relays and Signal Converters/Interface Converters

SIRIUS 3RS70 signal converters

Selection and ordering data

Signal type		Supply voltage	Width	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
At the input	At the output		mm	d					

Single-range converters

Passive

Type of electrical isolation, 2-way

4 ... 20 mA	4 ... 20 mA	--	6.2	2	3RS7020-□ET00		1	1 unit	41H
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Single-range converters

Active

Type of electrical isolation, 3-way

0 ... 10 V	0 ... 10 V	24 V AC/DC	6.2	2	3RS7000-□AE00		1	1 unit	41H
0 ... 20 mA	0 ... 10 V	24 V AC/DC	6.2	2	3RS7002-□AE00		1	1 unit	41H
4 ... 20 mA	0 ... 10 V	24 V AC/DC	6.2	2	3RS7003-□AE00		1	1 unit	41H
0 ... 10 V	0 ... 20 mA	24 V AC/DC	6.2	2	3RS7000-□CE00		1	1 unit	41H
0 ... 20 mA	0 ... 20 mA	24 V AC/DC	6.2	2	3RS7002-□CE00		1	1 unit	41H
4 ... 20 mA	0 ... 20 mA	24 V AC/DC	6.2	2	3RS7003-□CE00		1	1 unit	41H
0 ... 10 V	4 ... 20 mA	24 V AC/DC	6.2	2	3RS7000-□DE00		1	1 unit	41H
0 ... 20 mA	4 ... 20 mA	24 V AC/DC	6.2	2	3RS7002-□DE00		1	1 unit	41H
4 ... 20 mA	4 ... 20 mA	24 V AC/DC	6.2	2	3RS7003-□DE00		1	1 unit	41H

3RS7000-1AE00

3RS7000-2AE00

Multi-range converters

Active, switchable

Type of electrical isolation, 3-way

0 ... 10 V,	0 ... 10 V,	24 V AC/DC	6.2	2	3RS7005-□FE00		1	1 unit	41H
0 ... 20 mA,	0 ... 20 mA,	24 ... 240 V AC/DC	17.5	2	3RS7005-□FW00		1	1 unit	41H
4 ... 20 mA	4 ... 20 mA								
	0 ... 50 Hz	24 V AC/DC	6.2	2	3RS7005-□KE00		1	1 unit	41H
	0 ... 100 Hz	24 ... 240 V AC/DC	17.5	2	3RS7005-□KW00		1	1 unit	41H
	0 ... 1 kHz								
	0 ... 10 kHz								

3RS7005-1FW00

Multi-range converters

Active, with manual/automatic switch and setting potentiometer

Type of electrical isolation, 3-way

0 ... 10 V,	0 ... 10 V,	24 V AC/DC	17.5	2	3RS7025-□FE00		1	1 unit	41H
0 ... 20 mA,	0 ... 20 mA,	24 ... 240 V AC/DC	17.5	2	3RS7025-□FW00		1	1 unit	41H
4 ... 20 mA	4 ... 20 mA								

Universal converters

Active, switchable

Type of electrical isolation, 3-way

0 ... 60 mV,	0 ... 10 V,	24 V AC/DC	17.5	2	3RS7006-□FE00		1	1 unit	41H
0 ... 100 mV,	0 ... 20 mA,	24 ... 240 V AC/DC	17.5	2	3RS7006-□FW00		1	1 unit	41H
0 ... 300 mV,	4 ... 20 mA								
0 ... 500 mV,									
0 ... 1 V,									
0 ... 2 V,									
0 ... 5 V,									
0 ... 10 V,									
0 ... 20 V,									
2 ... 10 V,									
0 ... 5 mA,									
0 ... 10 mA,									
0 ... 20 mA,									
4 ... 20 mA,									
-5 ... +5 mA,									
-20 ... +20 mA									




3RS7006-1FE00

Type of electrical connection

- Screw terminals
- Spring-type terminals (push-in)

1
2

Accessories

Version	SD	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	d					
Galvanic isolation plates						
 3RQ3900-0A	Galvanic isolation plates	2	3RQ3900-0A	1	10 units	41H
	For electrical separation of different potentials when devices of different types are installed side by side					
Connecting combs						
 3RQ3901-0B	Connecting combs					
	For linking the same potentials, current carrying capacity for infeed max. 6 A					
	• 2-pole	2	3RQ3901-0A	1	10 units	41H
	• 4-pole	2	3RQ3901-0B	1	10 units	41H
	• 8-pole	2	3RQ3901-0C	1	10 units	41H
	• 16-pole	2	3RQ3901-0D	1	10 units	41H
Clip-on labels						
	Clip-on labels					
	For terminal marking and equipment labeling, white					
	• 5 x 5 mm ¹⁾	2	3RQ3902-0A	100	2 000 units	41H
Tools for opening spring-type terminals						
 3RA2908-1A	Spring-type terminals (push-in)					
	Screwdrivers	2	3RA2908-1A	1	1 unit	41B
	For all SIRIUS devices with spring-type terminals; 3.0 mm x 0.5 mm; length approx. 200 mm, titanium gray/black, partially insulated					

¹⁾ PC labeling system for individual inscription of unit labeling plates available from: Conta-Clip Verbindungstechnik GmbH, see page 16/16.

Relays

Coupling Relays and Signal Converters/Interface Converters

Notes