

## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### General data

##### Overview



SIRIUS 3UG5 monitoring relays

##### More information

Homepage, see [www.siemens.com/sirius-monitoring-relays](http://www.siemens.com/sirius-monitoring-relays)

SiePortal, see [www.siemens.com/product?3UG5](http://www.siemens.com/product?3UG5)

TIA Selection Tool Cloud (TST Cloud), see [www.siemens.com/tstcloud/?node=SIRIUSRelais](http://www.siemens.com/tstcloud/?node=SIRIUSRelais)

Conversion tool, see [www.siemens.com/conversion-tool](http://www.siemens.com/conversion-tool)

The SIRIUS 3UG5 monitoring relays for electrical and mechanical quantities enable constant monitoring of all important characteristic quantities that provide information about the reliability performance of the 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 3UG5 monitoring relays offer the following functions in various combinations:

- Undershooting and/or overshooting of limit values for voltage for 1-phase monitoring
- Undershooting and/or overshooting of the frequency
- Power monitoring
- 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 the liquid level
- Undershooting and/or overshooting of limit values for speed

The device family comprises devices with fixed function, analogically adjustable and digitally adjustable devices that can be parameterized using an intuitive LC display. There are further variants with Bluetooth, a Safety version or IO-Link.

##### Note:

The SIRIUS 3UG5 relays supersede the predecessor 3UG4. Exception: 3UG4 insulation monitoring relays, [see page 10/116](#).

#### Devices with fixed function or analogically adjustable devices



SIRIUS 3UG5512 and 3UG5514 relays

In addition to devices with a fixed function, such as 3UG5511 and 3UG5512, there are analogically adjustable devices, such as 3UG5514, whose parameters are set using potentiometers.

#### Digitally adjustable devices



SIRIUS 3UG5616 relays

Using the display, the digitally adjustable relays, such as SIRIUS 3UG5616 or 3UG5618, can be simply and intuitively parameterized via a menu and four buttons.

## General data

## Devices with Bluetooth



Parameter assignment via Bluetooth with SENTRON Powerconfig app

The 3UG5716 and 3UG5742 relays can also be supplied with Bluetooth. They can be easily parameterized using a smartphone with the SENTRON Powerconfig app. This provides a clearer way of setting the parameters. It is also possible to transfer parameter assignments already made to several devices.

## Devices in the Safety version

Selected devices are available with Safety certification up to SIL 1/PL c according to IEC 62061/IEC 61508 or ISO 13849-1.

## Digitally adjustable devices for IO-Link



SIRIUS 3UG5816 relay for IO-Link

Most functions are available as versions for IO-Link. This enables simple connection to the controller and use of the measured values of the device, for example, for maintenance.

Notes:

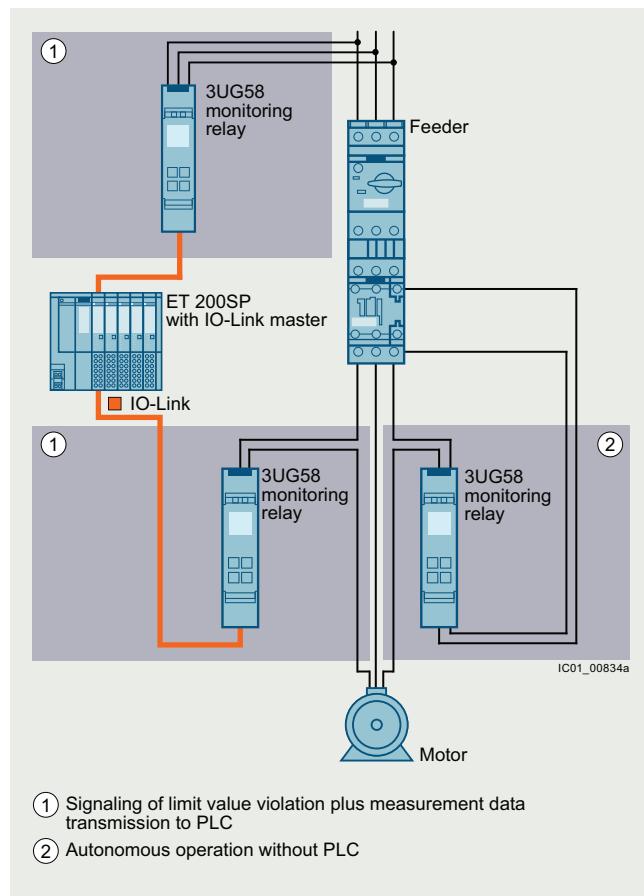
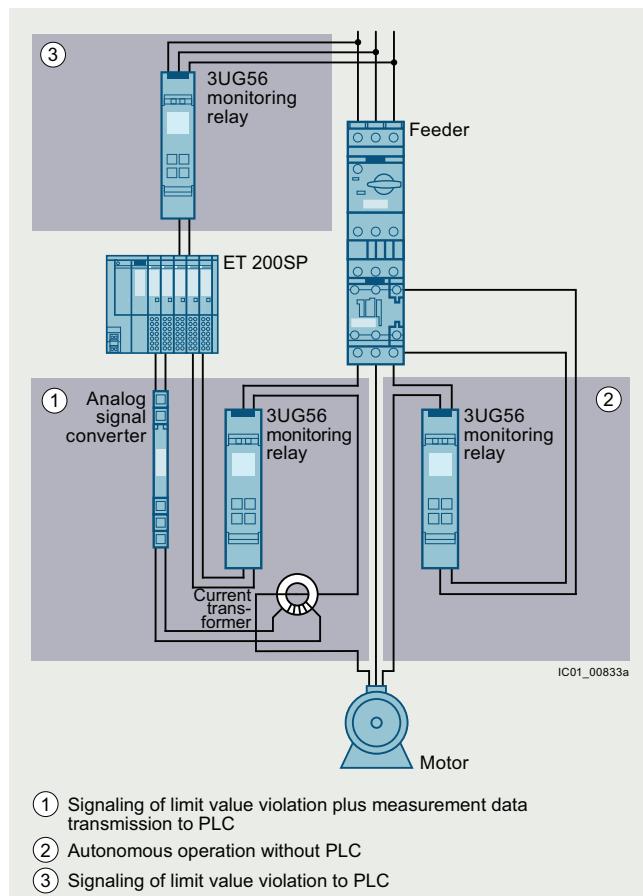
The IO-Link devices can be reset on the display or via IO-Link. More information on IO-Link, [see page 2/88 onwards](#).

## Monitoring and control devices

### Relays

#### SIRIUS 3UG5 monitoring relays for stand-alone installation

##### General data



Use of conventional monitoring relays

##### Notes:

Devices required for 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 2/99](#) or SM 1278 for S7-1200, see [page 2/98](#)).

Each monitoring relay requires an IO-Link channel.

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 cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see [www.siemens.com/cybersecurity-industry](http://www.siemens.com/cybersecurity-industry).

##### Article number scheme

Product versions	Article number
<b>Monitoring relays</b>	<b>3UG5</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> – <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>0</b>
Type of setting	<input type="checkbox"/>
Functions	<input type="checkbox"/> <input type="checkbox"/>
Connection type	<b>1</b> <b>2</b>
Contacts	<input type="checkbox"/>
Supply voltage	<input type="checkbox"/> <input type="checkbox"/>
Example	<b>3UG5 5 3 3 – 1 A L 3 0</b>

##### Note:

The article number 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

- Configurable monitoring functions, delay times, RESET response, etc.
- Versions for IO-Link and Bluetooth
- Safety versions
- Reduced stock-keeping thanks to minimized variance and large measuring ranges
- Wide-voltage power supply units for global applicability
- Reliable system diagnostics thanks to actual value display and connectable fault storage

- 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
- Customary screw and spring-loaded terminals (push-in) for quick and reliable wiring
- Device replacement without renewed wiring thanks to removable terminals

## Application

The SIRIUS 3UG5 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 configurable 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 3UG5 monitoring relays are available for the following applications:

- Line monitoring
- 1-phase voltage monitoring
- 1-phase current monitoring or power factor and active current monitoring
- Load monitoring
- Residual current monitoring
- Level monitoring
- Speed monitoring

Selected devices are approved for applications up to SIL 1 according to IEC 62061/IEC 61508 or PL c according to ISO 13849-1.

## Monitoring and control devices

### Relays

#### SIRIUS 3UG5 monitoring relays for stand-alone installation

##### Line monitoring

###### Overview



SIRIUS 3UG5 line monitoring relays



Video: Line monitoring relays SIRIUS 3UG5 - Detecting and signalling network and voltage faults in time

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.

The device family comprises devices with fixed or analogically adjustable functions and digitally adjustable devices that can be parameterized using an intuitive LC display. The 3UG5816 device is available as a version for IO-Link. The 3UG5716 relay is digitally adjustable with Bluetooth. It can be parameterized via a menu and four buttons or via the Powerconfig app.

Application	Line monitoring relay						
	3UG5 511	3UG5 512	3UG5 514	3UG5 616	3UG5 618	3UG5 716	3UG5 816
Phase sequence	✓						
Phase failure	--	✓					
Phase asymmetry	--	✓ (fixed)	✓				
Undervoltage	--		✓				
Overvoltage	--			✓			
Frequency	--			✓			
N conductor failure	--			✓			
Correction of the direction of rotation	--				✓	--	
SIL 1/PL c	--	✓	--		✓	--	
IO-Link	--					✓	
Bluetooth	--				✓	--	

✓ Available

-- Not available

Depending on the version, the relays monitor phase sequence, phase failure with and without N conductor monitoring, phase asymmetry, frequency, 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 line voltage or the directly set limit values are overshot or undershot. The rms value of the voltage is measured.

With the SIRIUS 3UG5618 line monitoring relay, a wrong direction of rotation can be corrected automatically.

The 3UG5512 and 3UG5618 devices are also available as versions with Safety certification up to SIL 1/PL c according to IEC 62061/IEC 61508 or ISO 13849-1.

The 3UG5511 and 3UG5512 devices have a fixed function. The 3UG5514 relays can be parameterized using a potentiometer.

###### Benefits

- Can be used without auxiliary voltage in any network from 160 to 690 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
- Reduced stock-keeping and logistics thanks to heavily reduced device variance
- Permanent display of actual value and power system fault type in case of digital versions
- Automatic correction of the direction of rotation by distinguishing between power system faults and wrong phase sequence
- Devices with frequency monitoring
- Devices with Safety certification according to SIL 1/PL c
- Devices with Bluetooth
- Communication via IO-Link with SIRIUS 3UG5816 relay and display and transmission of actual value and power system fault type to controller
- All versions with removable terminals
- All versions with screw or spring-loaded terminals (push-in)

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

## Technical specifications

## More information

Technical specifications, see  
<https://support.industry.siemens.com/cs/ww/en/ps/25412/td>  
 Equipment Manual, see  
<https://support.industry.siemens.com/cs/document/109814940>

FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/25412/faq>

Article number	3UG5511-.AR20, 3UG5511-.BR20, 3UG5512-.AR20, 3UG5512-.BR20	3UG5512-.AR21, 3UG5512-.BR21	3UG5514-.BR20	3UG5616-.CR20, 3UG5618-.CR20	3UG5618-.CR21	3UG5716-.CR20	3UG5816-.AA40
<b>General technical specifications</b>							
Width x height x depth	mm	22.5 x 100 x 90					
<b>Ambient temperature</b>							
• During operation	°C	-25 ... +60					
• During storage	°C	-40 ... +85					
• During transport	°C	-40 ... +85					
<b>Degree of protection IP</b>		IP20					
<b>Mounting position</b>		Any					
Installation altitude at height above sea level, maximum	m	2 000					
Electrical endurance (operating cycles) for AC-15 at 230 V typical		100 000					
Mechanical endurance (operating cycles), typical		10 000 000					
<b>Adjustable ON-delay time</b>							
• On starting	s	--		0.1 ... 30			
• On upper or lower limit violation	s	--	0.1 ... 20	0.1 ... 30			
Performance Level (PL) according to ISO 13849-1	--	PL c	--	PL c	--		
Safety Integrity Level (SIL) according to IEC 62061	--	SIL 1	--	SIL 1	--		
Vibration resistance according to IEC 60068-2-6	Hz; mm	10 ... 55; 0.35					
Shock resistance according to IEC 60068-2-27	g/ms	Half-sine wave 15/11					
Electromagnetic compatibility		IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4					
Electrical separation between input and output		Yes					
Type of electrical separation		Electrical separation				Protective separation	
Electromagnetic interference emission according to IEC 60947-1		Class A					
IO-Link protocol is supported		No				Yes	
Type of interface Bluetooth		No			Yes	No	
<b>Measuring circuit</b>							
Number of CO contacts with delayed switching	0	2				1	
<b>Control circuit</b>							
Current-carrying capacity of the output relay							
• At AC-15 at 50/60 Hz at 250 V	A	3					
• At DC-13							
- At 24 V	A	1					
- At 125 V	A	0.2					
- At 250 V	A	0.1					
Thermal current of the non-solid-state contact blocks, maximum	A	5					
Insulation voltage for overvoltage category III according to IEC 60664 for pollution degree 3	V	690					
Impulse withstand voltage	kV	6					
<b>Control supply voltage</b>							
• At AC							
- At 50 Hz	V	200 ... 690		120 ... 690			
- At 60 Hz	V	200 ... 690		120 ... 690			
• At DC	V	--		--		24	

## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### Line monitoring

Article number	3UG5511-.AR20, 3UG5511-.BR20, 3UG5512-.AR20, 3UG5512-.BR20	3UG5512-.AR21, 3UG5512-.BR21	3UG5514-.BR20	3UG5616-.CR20, 3UG5618-.CR20	3UG5618-.CR21	3UG5716-.CR20	3UG5816-.AA40
<b>Control circuit (continued)</b>							
Operating range factor of the control supply voltage, rated value at AC							
• At 50 Hz	0.85 ... 1.1						--
• At 60 Hz	0.85 ... 1.1						--
Measurable voltage at AC	V	160 ... 760		90 ... 760			
Supply voltage frequency	Hz	15 ... 70					--
Adjustable open-/closed-circuit principle	No			Yes			
Contact reliability of the auxiliary contacts	One contact failure per 100 million (17 V, 5 mA)						
Article number	3UG5511-1...., 3UG5611-1...., 3UG5711-1...., 3UG5811-1....			3UG5511-2...., 3UG5611-2...., 3UG5711-2...., 3UG5811-2....			
Type of electrical connection	 Screw terminals		 Spring-loaded terminals (push-in)				
Tightening torque	0.6 ... 0.8 Nm			--			
Type of connectable conductor cross-sections	<ul style="list-style-type: none"> <li>Solid</li> <li>Finely stranded           <ul style="list-style-type: none"> <li>Without end sleeves</li> <li>With end sleeves</li> </ul> </li> <li>For AWG cables           <ul style="list-style-type: none"> <li>Solid</li> <li>Stranded</li> </ul> </li> </ul>		1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> ) -- 1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> ) 1 x (20 ... 12), 2 x (20 ... 14) --		1 x (0.5 ... 4 mm <sup>2</sup> ) 1 x (0.5 ... 2.5 mm <sup>2</sup> ) 1 x (20 ... 12) 1 x (20 ... 12)		

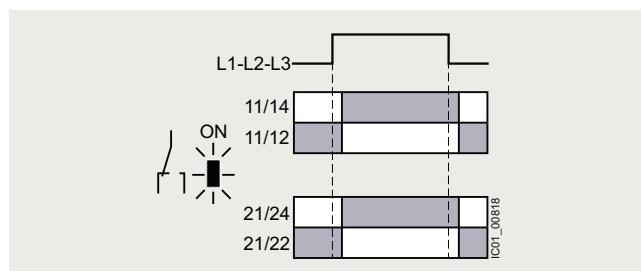
#### 3UG5511 monitoring relays

The 3UG5511 phase sequence relay monitors the phase sequence in a 3-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 corresponding response time and the green LED is lit. If the phase sequence is wrong, the output relay remains in its rest position.

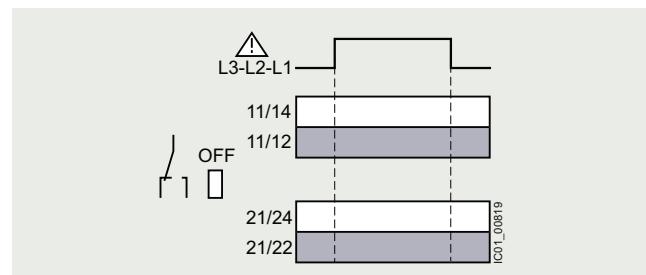
##### Note:

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. Since the 3UG5511 relays are not resistant to voltage feedback, such a phase failure is not detected. If this is required, the 3UG5512 monitoring relay must be used.

##### Correct phase sequence



##### Wrong phase sequence



## Line monitoring

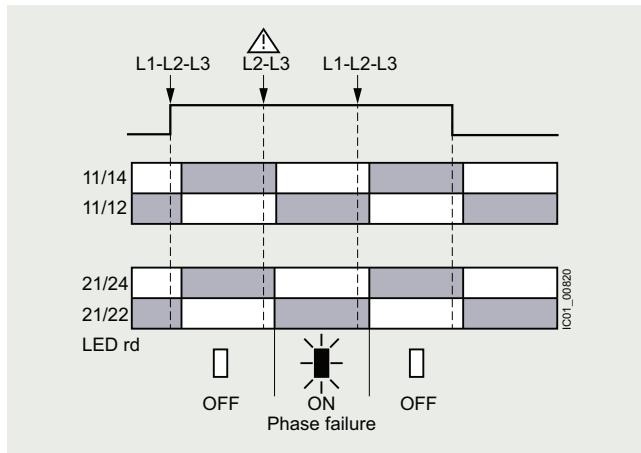
**3UG5512 monitoring relays**

The 3UG5512 line monitoring relay monitors 3-phase networks with regard to phase sequence, phase failure and phase asymmetry 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 terminals L1-L2-L3 is correct and there is no phase asymmetry, the output relay is energized. If the phase sequence is wrong or if there is phase asymmetry, 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. The device is also available as a version with SIL 1/PL c certification.

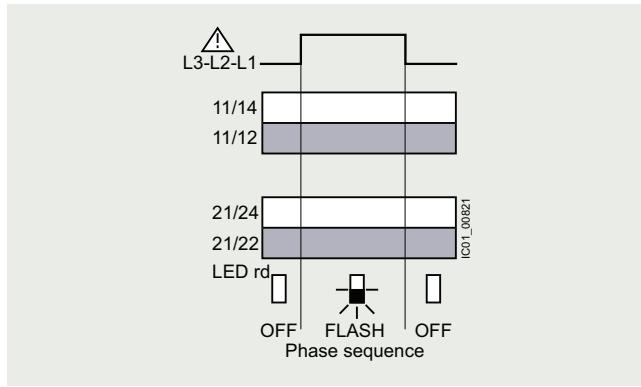
## Note:

The red LED is a fault diagnostic indicator and does not show the current relay status. The 3UG5512 monitoring relay is suitable for line frequencies from 15 to 70 Hz.

## Phase failure



## Wrong phase sequence

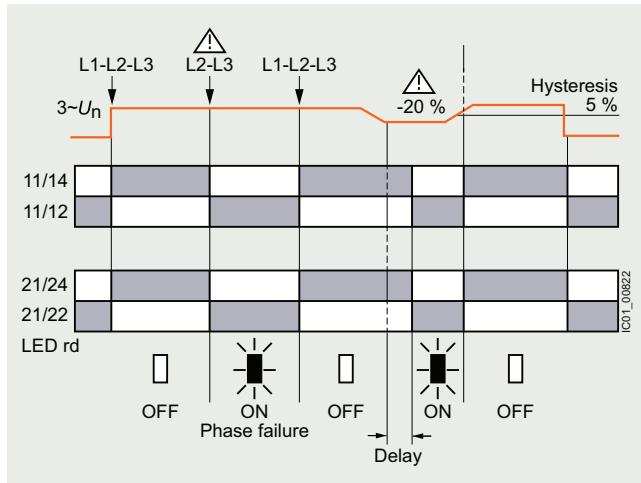
**3UG5514 monitoring relays**

The 3UG5514 line monitoring relay monitors 3-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 ON-delay time is adjustable from 0.1 to 20 s and responds to undervoltage. 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 AC 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. The device is also available as a version with SIL 1/PL c certification.

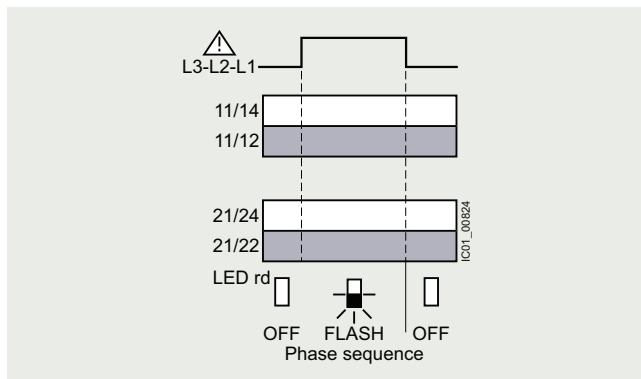
## Note:

The red LED is a fault diagnostic indicator and does not show the current relay status. The 3UG5514 monitoring relay is suitable for line frequencies from 15 to 70 Hz.

## Phase failure and undervoltage



## Wrong phase sequence



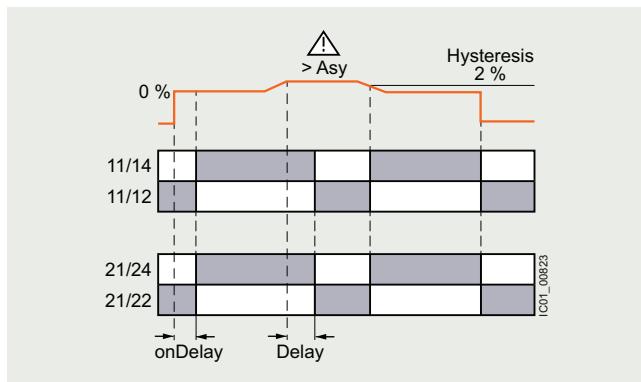
## Monitoring and control devices

### Relays

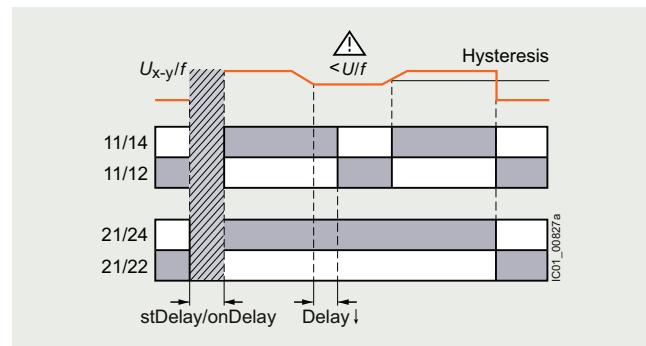
#### SIRIUS 3UG5 monitoring relays for stand-alone installation

##### Line monitoring

###### Phase asymmetry



###### Undervoltage, frequency undershoot



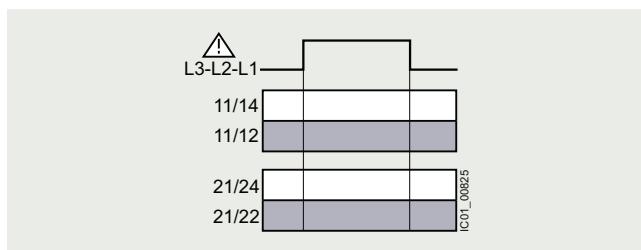
##### 3UG5616 and 3UG5716 monitoring relays

The 3UG5616 or 3UG5716 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 four buttons. The 3UG5716 relay can be additionally configured via Bluetooth using the SENTRON Powerconfig app. The 3UG5616 or 3UG5716 relay monitors 3-phase networks for phase failure, undervoltage, overvoltage, frequency and phase sequence. The hysteresis is adjustable from 0.1 to 300 V. In addition the device has two separately adjustable delay times for overshooting and undershooting limits. 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 AC and feedback through the load of up to 80%.

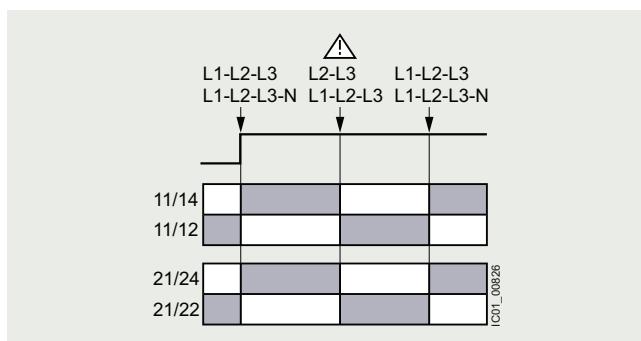
The 3UG5616 or 3UG5716 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with manual or automatic RESET.

###### With the closed-circuit principle selected

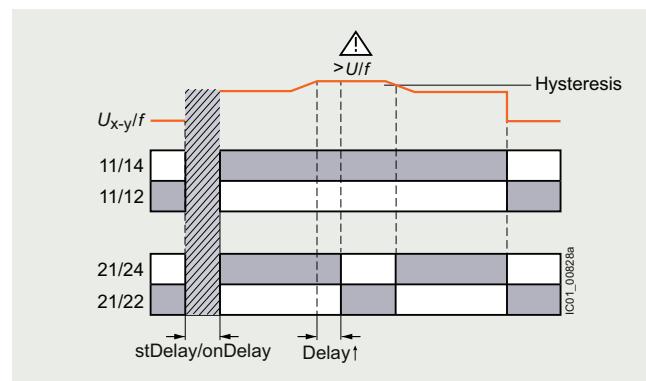
###### Wrong phase sequence



###### Phase failure



###### Overvoltage, frequency overshoot



##### 3UG5816 monitoring relays

The 3UG5816 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 four buttons. The 3UG5816 monitoring relay monitors a 3-phase network for phase sequence, phase failure, phase asymmetry, frequency, undervoltage and overvoltage. The hysteresis is adjustable from 0.1 to 300 V.

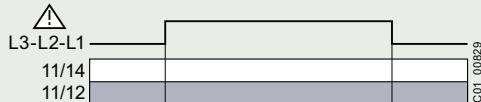
In addition the device has two separately adjustable delay times for overshooting and undershooting limits. If the direction of rotation is incorrect or a phase fails, the device switches off immediately. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide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

The 3UG5816 monitoring relays can be operated based on either the open-circuit or closed-circuit principle and with manual or automatic RESET.

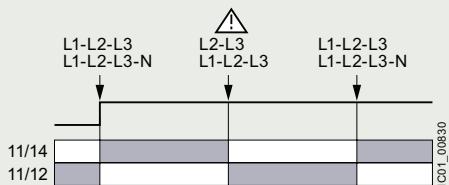
## Line monitoring

## With the closed-circuit principle selected

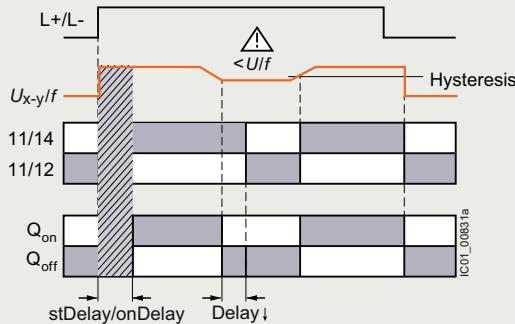
Wrong phase sequence



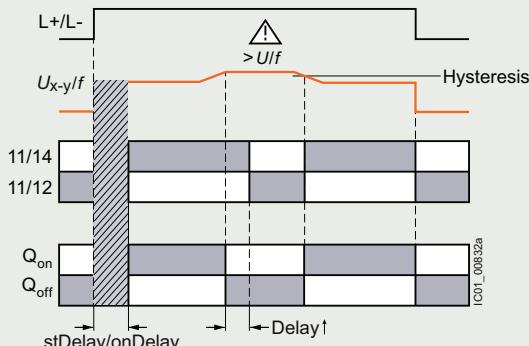
Phase failure



Undervoltage, frequency undershoot



Overvoltage, frequency overshoot



## 3UG5618 monitoring relays

The 3UG5618 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%.

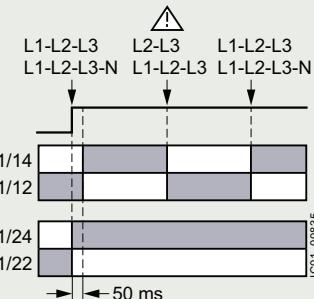
The device is equipped with a display and is parameterized using three buttons. It monitors 3-phase networks for phase sequence, phase failure, phase asymmetry, frequency, undervoltage and overvoltage. The hysteresis is adjustable from 0.1 to 300 V.

In addition the device has two separately adjustable delay times for overshooting and undershooting limits. The monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with manual or automatic RESET.

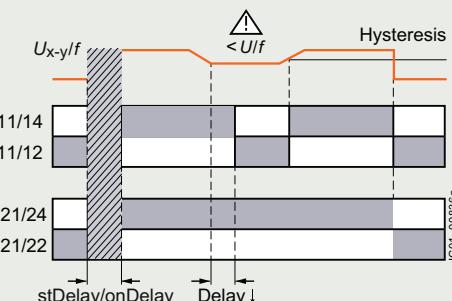
One of the CO contacts is used for warning or disconnection in the event of power system faults (voltage, frequency, asymmetry), the other one responds only to a wrong phase sequence. In conjunction with a contactor reversing assembly it is thus possible to change the direction of rotation automatically. The device is also available as a version with SIL 1/PL c certification.

## With the closed-circuit principle selected

Phase failure



Undervoltage, frequency undershoot



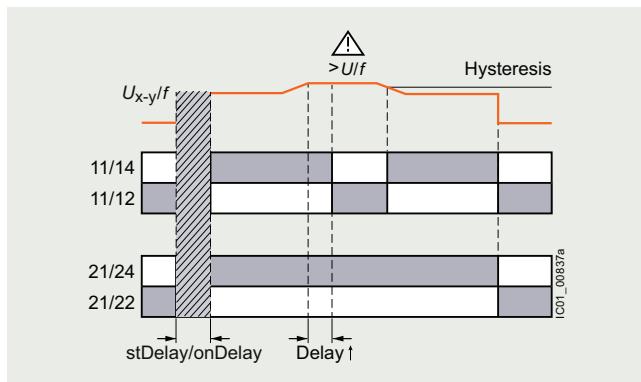
# Monitoring and control devices

## Relays

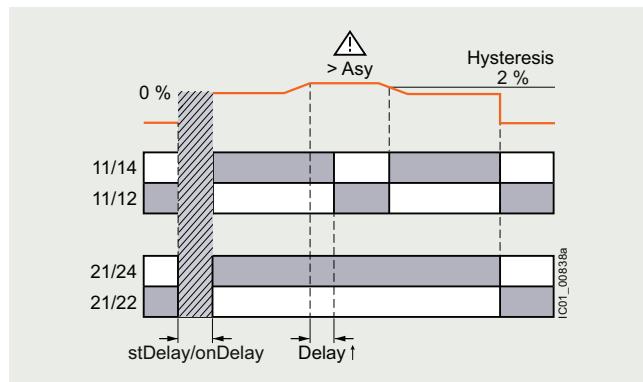
SIRIUS 3UG5 monitoring relays for stand-alone installation

### Line monitoring

Overvoltage, frequency overshoot



Phase asymmetry



### Selection and ordering data

PE (UNIT, SZ, M) = 1, PS\* = 1 unit, PG = 41H

Multi-unit packaging,  
see page 16/7.



3UG5511-2AR20



3UG5514-2BR20



3UG5816-2AA40

Phase failure detection	Undervoltage detection in 3 phases	Overvoltage detection in 3 phases	Frequency measurement	Adjustable ON-delay time on starting	Number of CO contacts with delayed switching	Screw terminals	Spring-loaded terminals (push-in)
				S	S		

#### Line monitoring relays with fixed function

##### Monitoring of phase sequence

--	--	--	--	--	--	0	3UG5511-1AR20	3UG5511-2AR20
						0	3UG5511-1BR20	3UG5511-2BR20

##### Monitoring of phase sequence, phase failure, and phase asymmetry

✓	--	--	--	--	--	0	3UG5512-1AR20	3UG5512-2AR20
						0	3UG5512-1BR20	3UG5512-2BR20
• For safety applications								
✓	--	--	--	--	--	0	3UG5512-1AR21	3UG5512-2AR21
						0	3UG5512-1BR21	3UG5512-2BR21

##### Analogically adjustable line monitoring relays

##### Monitoring of phase sequence, phase failure, phase asymmetry, and undervoltage

✓	✓	--	--	--	0.1 ... 20	2	3UG5514-1BR20	3UG5514-2BR20
---	---	----	----	----	------------	---	---------------	---------------

##### Digitally adjustable line monitoring relays

##### Monitoring of phase sequence, phase failure, phase asymmetry, N conductor (adjustable), frequency, undervoltage and overvoltage

✓	✓	✓	✓	✓	0.1 ... 30	0.1 ... 30	2	3UG5616-1CR20	3UG5616-2CR20
• With Bluetooth									
✓	✓	✓	✓	✓	0.1 ... 30	0.1 ... 30	2	3UG5716-1CR20	3UG5716-2CR20
• For IO-Link									
✓	✓	✓	✓	✓	0.1 ... 30	0.1 ... 30	1	3UG5816-1AA40	3UG5816-2AA40

##### Automatic correction of direction of rotation in case of wrong phase sequence, monitoring of phase failure, phase asymmetry, N conductor (adjustable), frequency, undervoltage and overvoltage

✓	✓	✓	✓	✓	0.1 ... 30	0.1 ... 30	2	3UG5618-1CR20	3UG5618-2CR20
• For safety applications									
✓	✓	✓	✓	✓	0.1 ... 30	0.1 ... 30	2	3UG5618-1CR21	3UG5618-2CR21

✓ Function available

-- Function not available

Accessories, see page 10/115.

\* You can order this quantity or a multiple thereof.  
Illustrations are approximate.

**Overview**

SIRIUS 3UG5532 monitoring relays

The analogically adjustable relays monitor 1-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).

Note:

Digital monitoring relay with voltage monitoring, [see page 10/90](#).

**Benefits**

- All versions with wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Freely configurable delay times
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-loaded terminals (push-in)

**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 supply voltages, particularly with battery power
- Threshold switch for analog signals from 0.1 to 10 V

# Monitoring and control devices

## Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

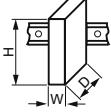
### Voltage monitoring **NEW**

#### Technical specifications

##### More information

Technical specifications, see  
<https://support.industry.siemens.com/cs/ww/en/ps/25412/td>

Equipment Manual, see  
<https://support.industry.siemens.com/cs/document/109814940>  
FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/25412/faq>

Article number	3UG5532-AW30	3UG5533-AL30
<b>General data</b>		
Width x height x depth	mm	22.5 x 100 x 90
		
<b>Ambient temperature</b>		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +80
• During transport	°C	-40 ... +80
<b>Degree of protection IP</b>		IP20
<b>Mounting position</b>		Any
Installation altitude at height above sea level, maximum	m	2 000
Electrical endurance (operating cycles) for AC-15 at 230 V typical		100 000
Mechanical endurance (operating cycles), typical		10 000 000
Adjustable ON-delay time on upper or lower limit violation	s	0.5 ... 30
Vibration resistance according to IEC 60068-2-6		$f = 4 \dots 5.81 \text{ Hz}$ , $d_{\max} = 15 \text{ mm}$ ; $f = 5.81 \dots 500 \text{ Hz}$ , $A_{\max} = 20 \text{ m/s}^2$ ; 10 cycles
Shock resistance according to IEC 60068-2-27	g/ms	Half-sine wave 15/11
Electromagnetic compatibility		IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4
Electrical separation between input and output		Yes
Type of electrical separation		Electrical separation
<b>Insulation voltage for overvoltage category III according to IEC 60664</b>		
• For pollution degree 2	V	690
• For pollution degree 3	V	690
<b>Impulse withstand voltage</b>	kV	6
<b>Measuring circuit</b>		
<b>Measurable voltage</b>		
• At AC	V	10 ... 760
• At DC	V	10 ... 760
<b>Adjustable voltage range</b>	V	10 ... 760
<b>Control circuit</b>		
Thermal current of the non-solid-state contact blocks, maximum	A	5
<b>Current-carrying capacity of the output relay</b>		
• At AC-15 at 400 V at 50/60 Hz	A	3
• At DC-13	A	
- At 24 V	A	1
- At 125 V	A	0.2
- At 250 V	A	0.1
<b>Operational current at 17 V, minimum</b>	mA	5
<b>Article number</b>		
3UG553.-1A.30		3UG553.-2A.30
<b>Type of electrical connection</b>		
<b>Tightening torque</b>	0.6 ... 0.8 Nm	--
<b>Type of connectable conductor cross-sections</b>		
• Solid	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 4 mm <sup>2</sup> )
• Finely stranded	--	1 x (0.5 ... 4 mm <sup>2</sup> )
- Without end sleeves	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 2.5 mm <sup>2</sup> )
- With end sleeve		
• For AWG cables	1 x (20 ... 12), 2 x (20 ... 14)	1 x (20 ... 12)
- Solid	--	1 x (20 ... 12)
- Stranded		

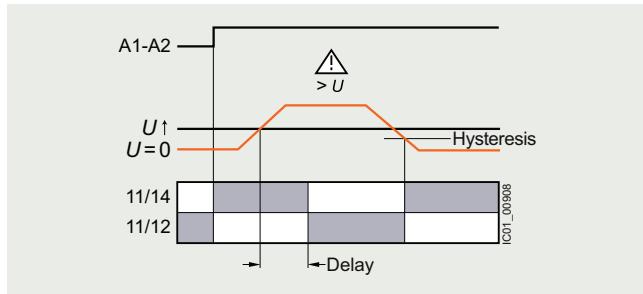
**3UG5532 monitoring relays**

The externally powered 3UG5532 voltage monitoring relay performs overshoot, undershoot or range monitoring of the voltage depending on parameterization.

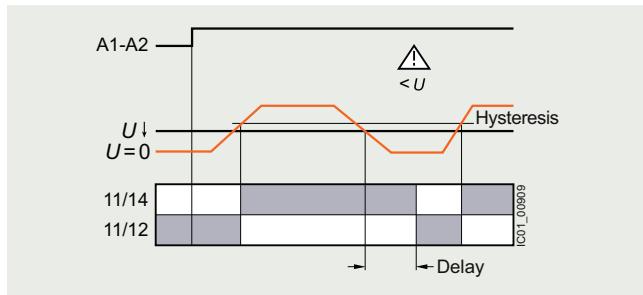
If one of these threshold values is reached, the output relay responds as soon as the delay time has elapsed. This delay time can be adjusted between 0.5 s and 30 s. The devices are parameterized using rotary switches.

The device works on the closed-circuit principle. One output changeover contact is available as signaling contact.

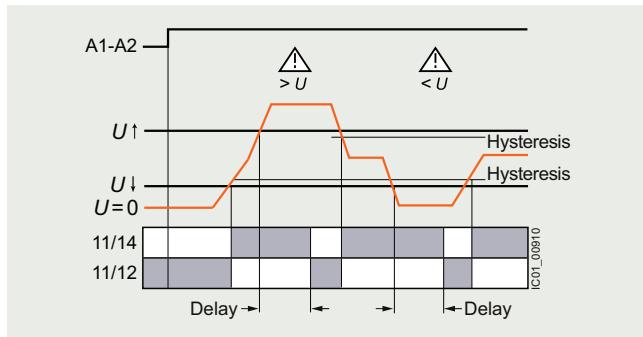
Overvoltage



Undervoltage



Range monitoring

**3UG5533 monitoring relays**

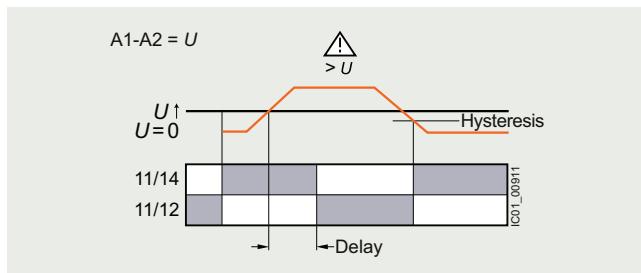
The analogically adjustable 3UG5533 voltage monitoring relay has an internal power supply and performs overshoot, undershoot or range monitoring of the voltage depending on parameterization.

The operating and measuring range extends from 20 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 as soon as the tripping delay time has elapsed. This delay time can be adjusted between 0.5 s and 30 s.

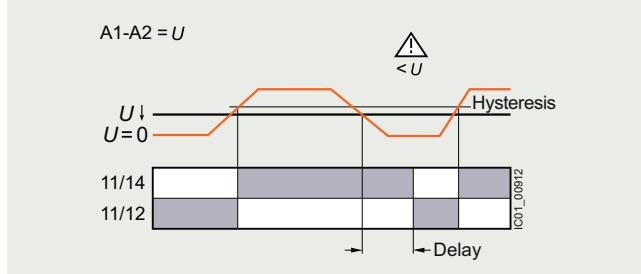
The device works on the closed-circuit principle. One output changeover contact is available as signaling contact.

Digital monitoring relay with voltage monitoring, [see page 10/90](#).

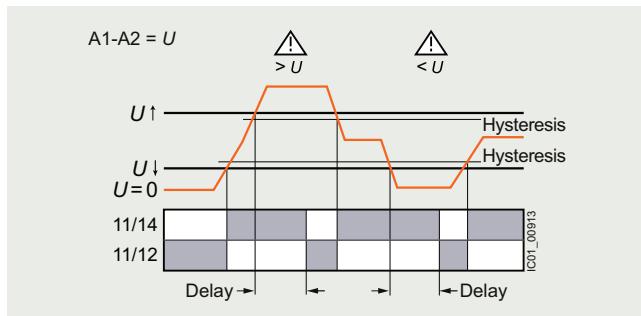
Overvoltage



Undervoltage



Range monitoring



## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### Voltage monitoring **NEW**

##### Selection and ordering data

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

Multi-unit packaging,  
see page 16/7.



3UG5532-1AW30



3UG5533-2AL30

Adjustable voltage range	Control supply voltage at AC at 50 Hz	Control supply voltage at DC	Adjustable ON-delay time on upper or lower limit violation	Number of CO contacts with delayed switching	Screw terminals	Spring-loaded terminals (push-in)
V	V	V	s		Article No.	Article No.

##### Analogically adjustable voltage monitoring relay

*Monitoring of undervoltage and overvoltage, internally powered  
without auxiliary voltage*

20 ... 275 AC/DC 24 ... 240 24 ... 240 0.5 ... 30 1

3UG5533-1AL30

3UG5533-2AL30

*Monitoring of undervoltage and overvoltage, externally powered  
with auxiliary voltage*

10 ... 760 AC/DC 24 ... 240 24 ... 240 0.5 ... 30 1

3UG5532-1AW30

3UG5532-2AW30

Accessories, [see page 10/115](#).

**Overview**

SIRIUS 3UG5522 monitoring relays

The analogically adjustable relays monitor 1-phase AC (rms value) and DC currents against the set threshold value for overshoot and undershoot.

Note:

Digital monitoring relays with current monitoring,  
see page 10/90.

**Benefits**

- Wide voltage supply range
- Variably adjustable to overshoot, undershoot or range monitoring
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-loaded terminals (push-in)

**Application**

- Overcurrent and undercurrent monitoring
- Monitoring the functionality of electrical loads
- Open-circuit monitoring

# Monitoring and control devices

## Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

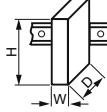
### Current monitoring **NEW**

#### Technical specifications

##### More information

Technical specifications, see  
<https://support.industry.siemens.com/cs/ww/en/ps/25412/td>

Equipment Manual, see  
<https://support.industry.siemens.com/cs/document/109814940>  
FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/25412/faq>

Article number	3UG5522-AW30	
<b>General data</b>		
Width x height x depth	mm	22.5 x 100 x 90
		
<b>Ambient temperature</b>		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +80
• During transport	°C	-40 ... +80
<b>Degree of protection IP</b>	IP20	
<b>Mounting position</b>	Any	
<b>Installation altitude at height above sea level, maximum</b>	m	2 000
<b>Electrical endurance (operating cycles) for AC-15 at 230 V typical</b>	100 000	
<b>Mechanical endurance (operating cycles), typical</b>	10 000 000	
<b>Adjustable ON-delay time on upper or lower limit violation</b>	s	0.5 ... 30
<b>Vibration resistance according to IEC 60068-2-6</b>	$f = 4 \dots 5.81 \text{ Hz}, d_{\max} = 15 \text{ mm}; f = 5.81 \dots 500 \text{ Hz}, A_{\max} = 20 \text{ m/s}^2; 10 \text{ cycles}$	
<b>Shock resistance according to IEC 60068-2-27</b>	g/ms	Half-sine wave 15/11
<b>Electromagnetic compatibility</b>	IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4	
<b>Electrical separation between input and output</b>	Yes	
<b>Type of electrical separation</b>	Electrical separation	
<b>Insulation voltage for overvoltage category III according to IEC 60664</b>		
• For pollution degree 2	V	690
• For pollution degree 3	V	690
<b>Impulse withstand voltage</b>	kV	6
<b>Measuring circuit</b>		
<b>Measurable current</b>	A	0.05 ... 15
<b>Control circuit</b>		
<b>Thermal current of the non-solid-state contact blocks, maximum</b>	A	5
<b>Current-carrying capacity of the output relay</b>		
• At AC-15 at 400 V at 50/60 Hz	A	3
• At DC-13	A	1
- At 24 V	A	0.2
- At 125 V	A	0.1
- At 250 V	A	0.1
<b>Operational current at 17 V, minimum</b>	A	5
Article number	3UG5522-1AW30	3UG5522-2AW30
<b>Type of electrical connection</b>	Screw terminals	Spring-loaded terminals (push-in)
<b>Tightening torque</b>	0.6 ... 0.8 Nm	--
<b>Type of connectable conductor cross-sections</b>		
• Solid	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 2.5 mm <sup>2</sup> )
• Finely stranded	--	1 x (0.5 ... 4 mm <sup>2</sup> )
- Without end sleeves	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 2.5 mm <sup>2</sup> )
- With end sleeve	--	1 x (20 ... 12)
• For AWG cables	1 x (20 ... 12), 2 x (20 ... 14)	1 x (20 ... 12)
- Solid	--	1 x (20 ... 12)
- Stranded	--	

**3UG5522 monitoring relays**

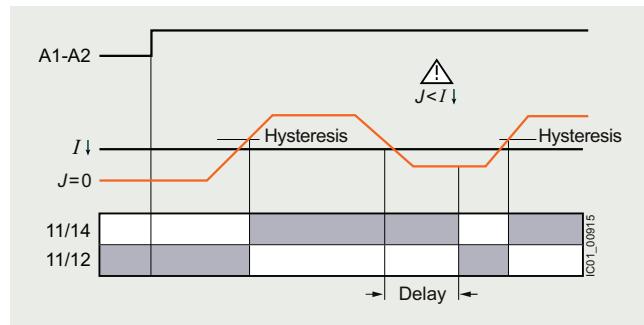
The 3UG5522 current monitoring relay is supplied with an auxiliary voltage of 24 to 240 V AC/DC and performs overshoot, undershoot or range monitoring of the current depending on parameterization. The device is parameterized using three rotary switches and has a changeover contact.

The measuring range extends from 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 as soon as the tripping delay time has elapsed. This time can be adjusted between 0.5 s and 30 s. The device works on the closed-circuit principle.

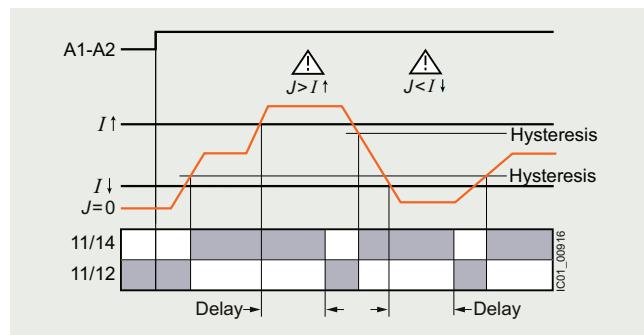
## Current overshoot



## Current undershoot



## Range monitoring

**Selection and ordering data**

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

Multi-unit packaging,  
see page 16/7.



3UG5522-1AW30



3UG5522-2AW30

Measurable current	Control supply voltage at AC at 50 Hz	Control supply voltage at DC	Adjustable ON-delay time on upper or lower limit violation	Number of CO contacts with delayed switching	Screw terminals	Spring-loaded terminals (push-in)		
A	V	V	S		Article No.	Price per PU	Article No.	Price per PU
<b>Analogically adjustable current monitoring relays</b>								

**Monitoring of underright and overcurrent, externally powered with auxiliary voltage**

0.05 ... 15 24 ... 240 24 ... 240 0.5 ... 30 1

3UG5522-1AW30

3UG5522-2AW30

Accessories, see page 10/115.

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

## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### Current, active current, voltage, power factor, and power monitoring **NEW**

##### Overview



SIRIUS 3UG5643 monitoring relays

With the 3UG5 current, active current, voltage, power factor and power monitoring relay, it is possible to perform load monitoring of motors.

The 3UG5742 relay can be conveniently, easily and clearly parameterized on a smartphone using the SENTRON Powerconfig app. The current values can also be displayed.

The 3UG5842 relay can be parameterized via IO-Link using a PC. By connection to the controller, the values of the device can be used for ongoing operation or for maintenance.

The 3UG5642 relay is available as a version with SIL 1/PL c.

##### Benefits

- Can be used worldwide thanks to wide voltage range from 90 to 690 V
- Monitoring of even small 1-phase motors with a no-load current below 0.5 A
- Simple determination of threshold values by directly referencing measured variables to motor loading
- Range monitoring and active current measurement enable detection of cable breaks between control cabinets and motors, as well as phase failures
- Selectable device function: Current, voltage, power factor ( $I_{res}$ ) and power
- Devices with Safety certification according to SIL 1/PL c
- Devices with Bluetooth
- Communication via IO-Link with the SIRIUS 3UG5842 relay and display and transmission of actual values and diagnostics to the controller
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-loaded terminals (push-in)

##### 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 controlling compensation systems
- Broken cable between control cabinet and motor

NEW

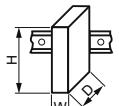
Current, active current, voltage, power factor, and power monitoring

## Technical specifications

## More information

Technical specifications, see  
<https://support.industry.siemens.com/cs/ww/en/ps/25412/td>

Equipment Manual, see  
<https://support.industry.siemens.com/cs/document/109814940>  
 FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/25412/faq>

Type	3UG5642-CW30	3UG5642-CW31	3UG5643-CS20	3UG5742-CW30	3UG5842-AA40				
<b>General data</b>									
<b>Width x height x depth</b>									
	 mm	22.5 x 100 x 90							
<b>Ambient temperature</b>									
• During operation	°C	-25 ... +60							
• During storage	°C	-40 ... +80							
• During transport	°C	-40 ... +80							
<b>Degree of protection IP</b>	IP20								
<b>Mounting position</b>	Any								
<b>Installation altitude at height above sea level, maximum</b>	m	2 000							
<b>Electrical endurance (operating cycles) for AC-15 at 230 V typical</b>	100 000								
<b>Mechanical endurance (operating cycles), typical</b>	10 000 000								
<b>Adjustable ON-delay time</b>									
• On starting	s	0 ... 999.9							
• On upper or lower limit violation	s	0 ... 999.9							
<b>Safety Integrity Level (SIL) according to IEC 62061</b>	--	SIL 1	--						
<b>Performance Level (PL) according to ISO 13849-1</b>	--	PL c	--						
<b>Vibration resistance according to IEC 60068-2-6</b>	$f = 4 \dots 5.81 \text{ Hz}$ , $d_{\max} = 15 \text{ mm}$ ; $f = 5.81 \dots 500 \text{ Hz}$ , $A_{\max} = 20 \text{ m/s}^2$ ; 10 cycles								
<b>Shock resistance according to IEC 60068-2-27</b>	g/ms	Half-sine wave 15/11							
<b>Electromagnetic compatibility</b>	IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4								
<b>Electrical separation between input and output</b>	Yes								
<b>Insulation voltage for overvoltage category III according to IEC 60664</b>									
• For pollution degree 2	V	690							
• For pollution degree 3	V	690							
<b>Impulse withstand voltage</b>	kV	6							
<b>Type of interface Bluetooth</b>	--		Yes	--					
<b>IO-Link protocol is supported</b>	--			Yes					
<b>Measuring circuit</b>									
<b>Adjustable current response value</b>									
• 1	A	0.003 ... 15	0.05 ... 15	0.003 ... 15					
• 2	A	0.003 ... 15	0.05 ... 15	0.003 ... 15					
<b>Measurable voltage</b>									
• At AC	V	0.1 ... 760	76 ... 760	0.1 ... 760					
<b>Type of voltage for monitoring</b>	V	AC/DC	AC	AC/DC					
<b>Control circuit</b>									
<b>Number of CO contacts with delayed switching</b>	2			1					
<b>Thermal current of the non-solid-state contact blocks, A maximum</b>	A	5							
<b>Current-carrying capacity of the output relay</b>									
• At AC-15 at 400 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							
<b>Operational current at 17 V, minimum</b>	mA	5							

## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### Current, active current, voltage, power factor, and power monitoring

**NEW**

Article number	3UG5642-1...., 3UG5643-1...., 3UG5742-1...., 3UG5842-1....	3UG5642-2...., 3UG5643-2...., 3UG5742-2...., 3UG5842-2....
Type of electrical connection	 Screw terminals	 Spring-loaded terminals (push-in)
Tightening torque	0.6 ... 0.8 Nm	--
Type of connectable conductor cross-sections		
• Solid	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 4 mm <sup>2</sup> )
• Finely stranded	--	1 x (0.5 ... 4 mm <sup>2</sup> )
- Without end sleeves	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 2.5 mm <sup>2</sup> )
- With end sleeve	--	--
• For AWG cables	1 x (20 ... 12), 2 x (20 ... 14)	1 x (20 ... 12)
- Solid	--	1 x (20 ... 12)
- Stranded	--	--

#### 3UG5642, 3UG5643, and 3UG5742 monitoring relays

The 3UG5642 and 3UG5742 monitoring relays are supplied with an auxiliary voltage of 24 to 240 V AC/DC. The 3UG5643 monitoring relay has an internal power supply.

The 3UG56 and 3UG57 relays have a display and are parameterized with four buttons.

The 3UG5742 monitoring relay can be additionally configured via Bluetooth using the SENTRON Powerconfig app, [see page 10/73](#).

Depending on the function selected, the devices are used for 1-phase monitoring of voltage, active and apparent current, active and apparent power, power factor and frequency for overshooting, undershooting or range monitoring.

If the load current overshoots the lower measuring range limit 0.05 A, the set ON-delay time begins (onDel). During this time, if the set limit values are undershot or exceeded, this does not lead to a relay reaction of the changeover contacts.

The set tripping delay time starts if one of the measured values overshoots or undershoots the corresponding set threshold value. After expiry of this time, the K1 and K2 output relays change the switching state, depending on the set relay switching response.

Using the "transformer transmission factor" parameter (I scale), the display can reproduce the measured primary current. The maximum primary current that can be measured is 9999 A.

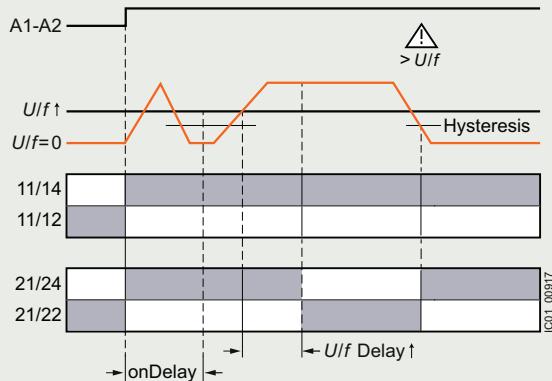
To adapt the monitoring relay to different external circuit connections and applications, the device can be operated according to the open-circuit or closed-circuit principle.

If manual RESET is selected in the menu, the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continue to be displayed, even when the measured variable reaches a permissible value again. This stored fault condition can be reset by pressing the Back key and confirming with the Enter key.

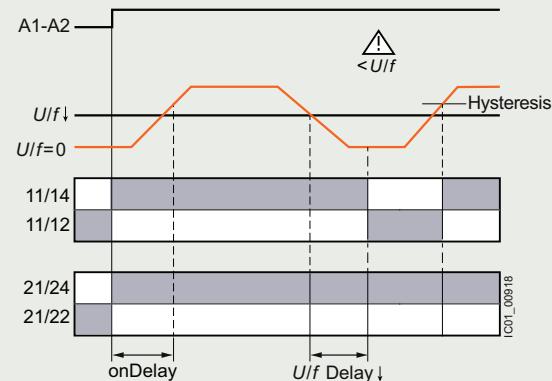
**NEW****Current, active current, voltage, power factor, and power monitoring**

With the closed-circuit principle selected

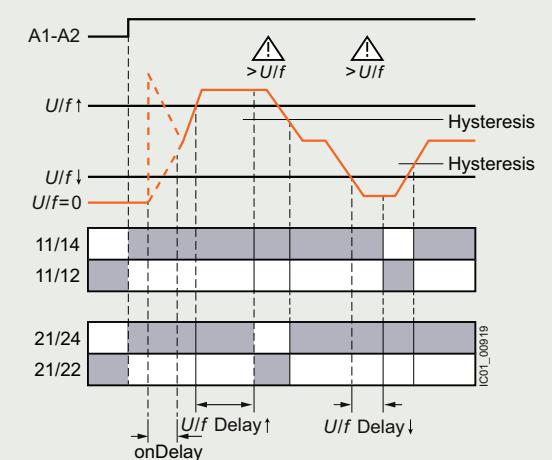
Overshooting of voltage or frequency



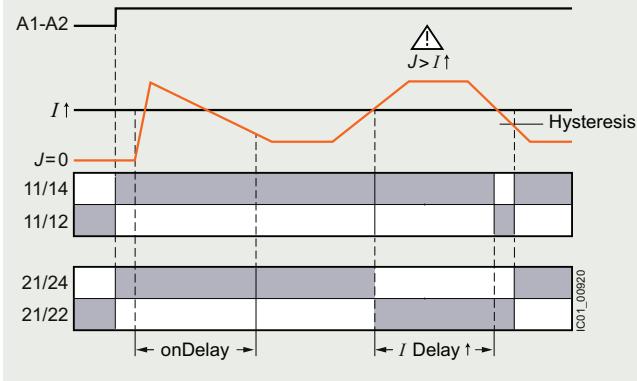
Undershooting of voltage or frequency



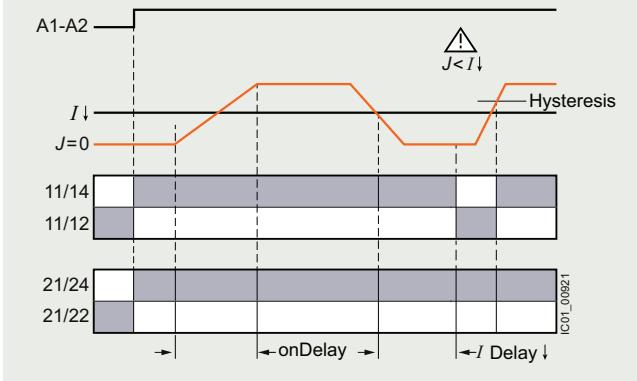
Range monitoring of voltage or frequency



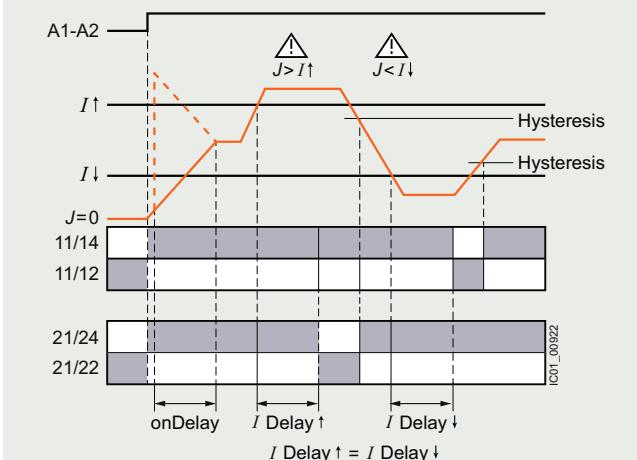
Overshooting of current



Undershooting of current



Range monitoring of current



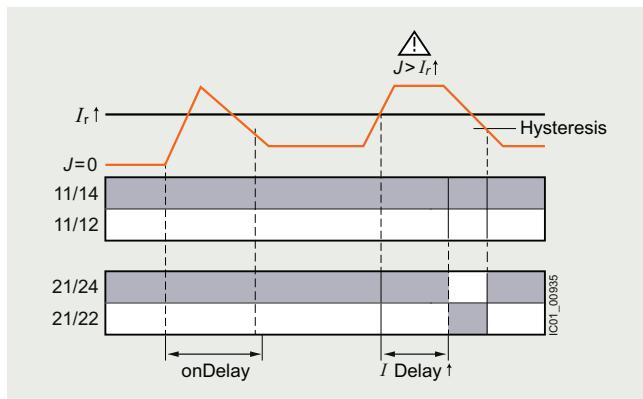
## Monitoring and control devices

### Relays

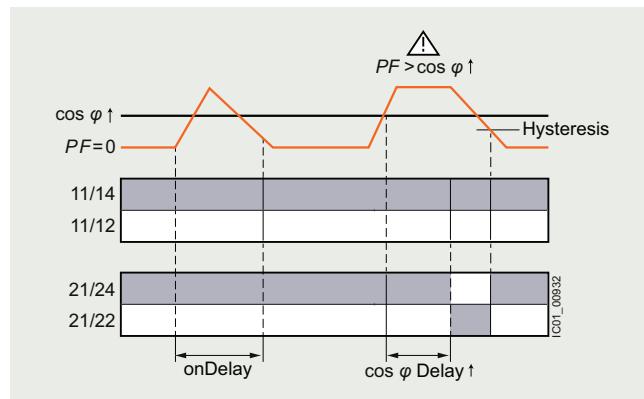
SIRIUS 3UG5 monitoring relays for stand-alone installation

#### Current, active current, voltage, power factor, and power monitoring **NEW**

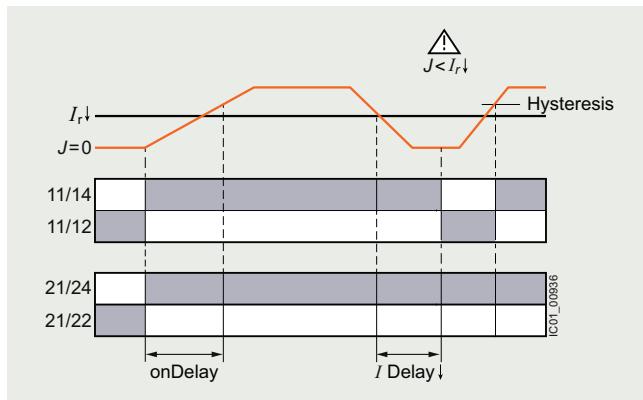
Overshooting of active current



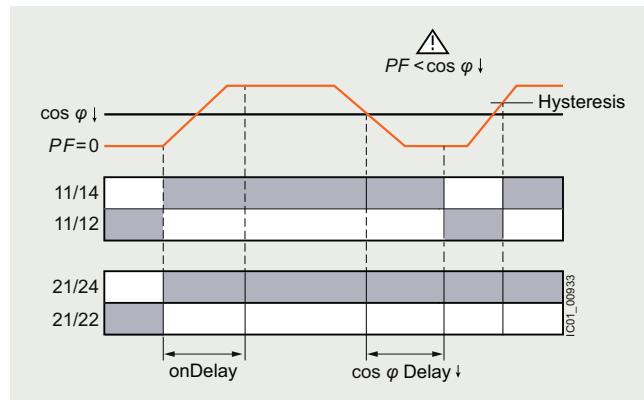
Overshooting of power factor



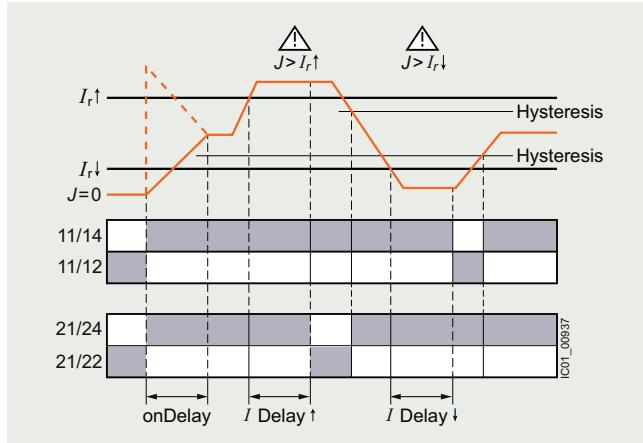
Undershooting of active current



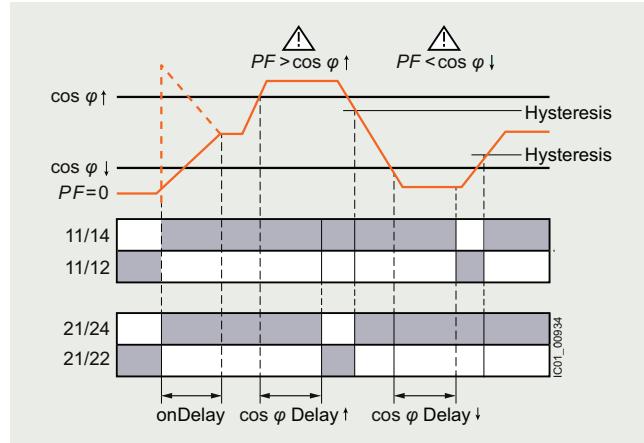
Undershooting of power factor



Range monitoring of active current



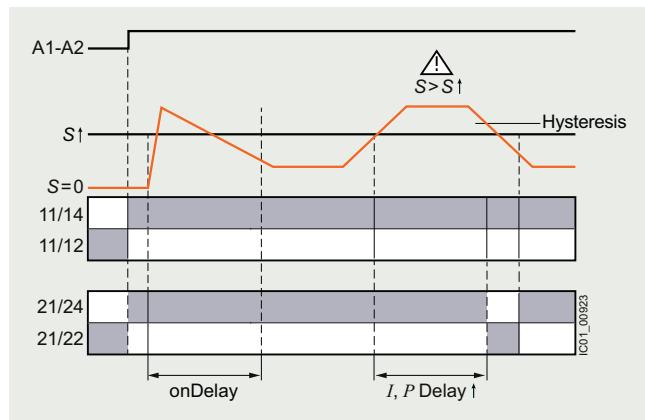
Range monitoring of power factor



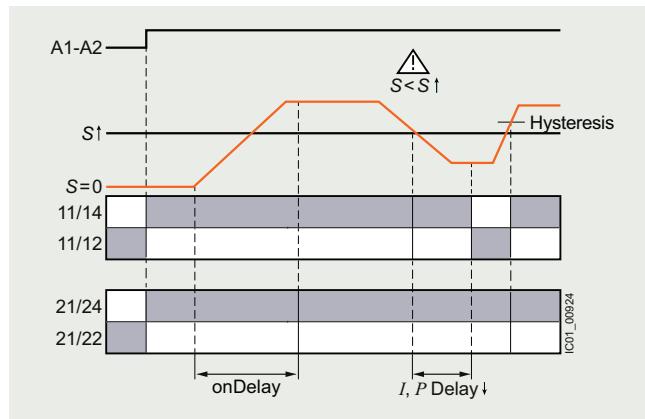
NEW

Current, active current, voltage, power factor, and power monitoring

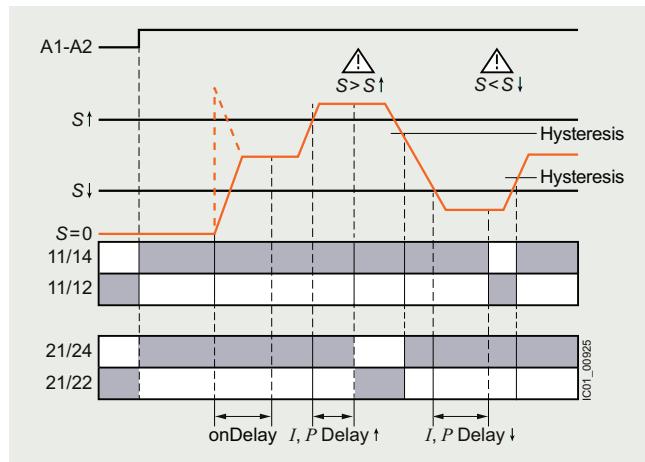
Overshooting of power



Undershooting of power



Range monitoring of power

**3UG5842 monitoring relays**

The 3UG5842 monitoring relay is supplied with an auxiliary voltage of 24 V DC and, depending on the function selected, the devices are used for 1-phase monitoring of voltage, active and apparent current, active and apparent power, power factor and frequency for overshooting, undershooting, or range monitoring.

The 3UG5842 relays have a display and are parameterized with four buttons.

If the supply voltage is switched on and no load current is flowing, the display indicates ---. If the load current overshoots the lower measuring range limit 0.05 A, the set ON-delay time begins (onDel). During this time, undershooting or overshooting of the set threshold values will not result in a relay response of the CO contact. The set tripping delay time starts if one of the measured values overshoots or undershoots the corresponding set threshold value.

After expiry of this time, the K1 output relay changes the switching state, depending on the set relay switching response. Using the "transformer transmission factor" parameter (I scale), the display and transmission of the measured values via IO-Link can reproduce the measured primary current. The maximum primary current that can be measured is 9999 A. To adapt the current monitoring relay to different external circuit connections and applications, the device can be operated according to the open-circuit or closed-circuit principle.

The 3UG5842 monitoring relays are equipped with a C/Q connection to IO-Link. If the IO-Link connection is not used for communication via IO-Link, the 3UG5842 relays for IO-Link operate in standard I/O mode (SIO mode). In this mode, the C/Q terminal is used as a semiconductor output that switches when the warning threshold for undershoot or overshoot is violated.

- Qoff: 24 V DC supply voltage present.
- Qon: The output has a high resistance.

Note:

For function diagrams of the 3UG5842 devices, [see Manual](#).

## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

Current, active current, voltage, power factor, and power monitoring **NEW**

#### Selection and ordering data

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

Multi-unit packaging,  
see page 16/7.



3UG5642-1CW30



3UG5643-2CS20

Measurable current A	Control supply voltage V	Number of CO contacts with delayed switching	Screw terminals Article No.	Spring-loaded terminals (push-in) Article No.
<b>Digitally adjustable monitoring relay</b>				
<i>Monitoring of current, active current, voltage, power factor and power, internally powered without auxiliary voltage</i>				
0.05 ... 15	90 ... 690 AC	2	3UG5643-1CS20	3UG5643-2CS20
<i>Monitoring of current, active current, voltage, power factor and power, externally powered with auxiliary voltage</i>				
0.003 ... 15 • For safety applications	24 ... 240 AC/DC	2	3UG5642-1CW30	3UG5642-2CW30
0.003 ... 15 • With Bluetooth	24 ... 240 AC/DC	2	3UG5642-1CW31	3UG5642-2CW31
0.003 ... 15 • For IO-Link	24 ... 240 AC/DC	2	3UG5742-1CW30	3UG5742-2CW30
0.003 ... 15	24 ... 24 DC	1	3UG5842-1AA40	3UG5842-2AA40

Accessories, [see page 10/115](#).

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

**Overview**

SIRIUS 3UG5625 monitoring relays

The 3UG5625 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 according to DIN VDE 0100-530/IEC TR 60755).

The 3UG5825 device is available as a version for IO-Link.

**Benefits**

- Worldwide use thanks to wide voltage range from 24 to 240 V AC/DC
- High measurement 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
- Communication via IO-Link with the SIRIUS 3UG5825 relay as well as display and transmission of actual values and diagnostics to the controller
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-loaded terminals (push-in)

**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.

# Monitoring and control devices

## Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

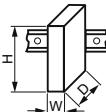
### Residual current monitoring > Residual current monitoring relays **NEW**

#### Technical specifications

##### More information

Technical specifications, see  
<https://support.industry.siemens.com/cs/ww/en/ps/25412/td>

Equipment Manual, see  
<https://support.industry.siemens.com/cs/document/109814940>  
 FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/25412/faq>

Article number	3UG5625-CW30	3UG5825-AA40
<b>General data</b>		
Width x height x depth	22.5 x 100 x 90	
		mm
<b>Ambient temperature</b>		
• During operation	°C	-25 ... +60
• During storage	°C	-40 ... +80
• During transport	°C	-40 ... +80
<b>Degree of protection IP</b>	IP20	
<b>Mounting position</b>	Any	
<b>Installation altitude at height above sea level, maximum</b>	m	2 000
<b>Electrical endurance (operating cycles) for AC-15 at 230 V typical</b>		100 000
<b>Mechanical endurance (operating cycles), typical</b>		10 000 000
<b>Adjustable ON-delay time</b>		
• On starting	s	0 ... 999.9
<b>Vibration resistance according to IEC 60068-2-6</b>	$f = 4 \dots 5.81 \text{ Hz}, d_{\max} = 15 \text{ mm}; f = 5.81 \dots 500 \text{ Hz}, A_{\max} = 20 \text{ m/s}^2; 10 \text{ cycles}$	
<b>Shock resistance according to IEC 60068-2-27</b>	g/ms	Half-sine wave 15/11
<b>Electromagnetic compatibility</b>	IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4	
<b>Electrical separation between input and output</b>	Yes	
<b>Type of electrical separation</b>	Electrical separation	
<b>Insulation voltage for overvoltage category III according to IEC 60664</b>		
• For pollution degree 2	V	690
• For pollution degree 3	V	690
<b>IO-Link protocol is supported</b>	No	Yes
<b>Measuring circuit</b>		
<b>Measurable line frequency</b>	Hz	16 ... 400
<b>Adjustable current response value</b>		
• 1	A	0.03 ... 40
• 2	A	0.03 ... 40
<b>Control circuit</b>		
<b>Number of CO contacts with delayed switching</b>	2	1
<b>Thermal current of the non-solid-state contact blocks, maximum</b>	A	5
<b>Current-carrying capacity of the output relay</b>		
• At AC-15 at 400 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
<b>Operational current at 17 V, minimum</b>	mA	5
Article number	3UG5625-1...0, 3UG5825-1...0	3UG5625-2...0, 3UG5825-2...0
<b>Type of electrical connection</b>	 Screw terminals	 Spring-loaded terminals (push-in)
<b>Tightening torque</b>	0.6 ... 0.8 Nm	--
<b>Type of connectable conductor cross-sections</b>		
• Solid	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 4 mm <sup>2</sup> )
• Finely stranded	--	1 x (0.5 ... 4 mm <sup>2</sup> )
- Without end sleeves	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 2.5 mm <sup>2</sup> )
- With end sleeve		
• For AWG cables	1 x (20 ... 12), 2 x (20 ... 14)	1 x (20 ... 12)
- Solid	--	1 x (20 ... 12)
- Stranded		

NEW

Residual current monitoring &gt; Residual current monitoring relays

**3UG5625 monitoring relays**

The main conductor, and any neutral conductor to which a load is connected, are routed through the opening of the toroidal core of a residual-current transformer. A secondary winding is placed around this toroidal 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, 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 relay symbol flashes on the display. On expiry of this time, the associated changeover contact changes the switching state.

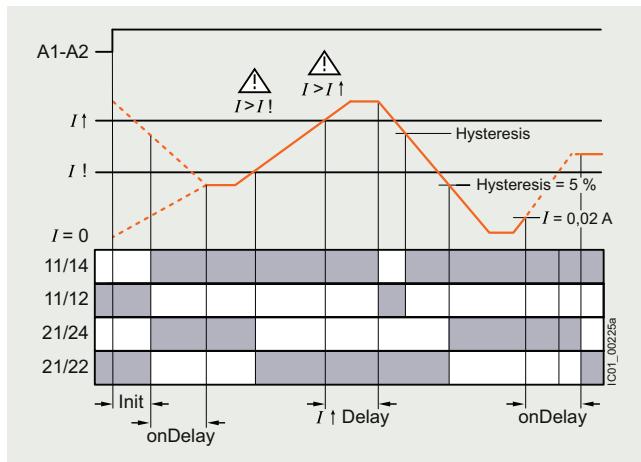
ON-delay time for motor start

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 automatic RESET



The 3UG5625 monitoring relays can be operated based on either the open-circuit or closed-circuit principle and with manual or automatic RESET.

**3UG5825 monitoring relays**

The main conductor, and any neutral conductor to which a load is connected, are routed through the opening of the toroidal core of a residual-current transformer. A secondary winding is placed around this toroidal 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, 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 relay symbol flashes on the display. On expiry of this time, the associated changeover contact changes the switching state.

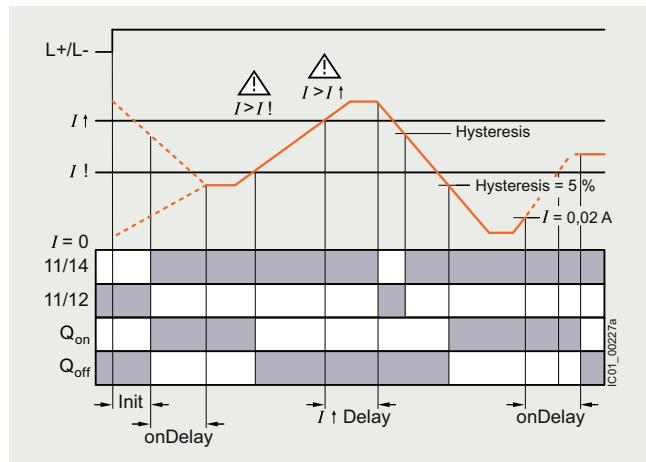
ON-delay time for motor start

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 automatic RESET



The 3UG5825 monitoring relays can be operated based on either the open-circuit or closed-circuit principle and with manual or automatic RESET.

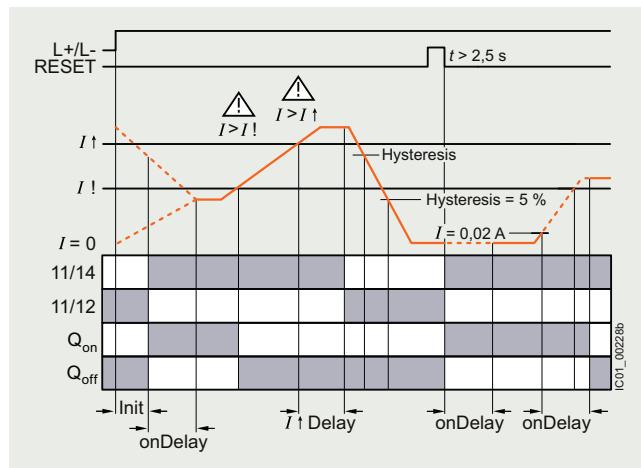
## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### Residual current monitoring > Residual current monitoring relays **NEW**

Residual current monitoring with manual RESET



If manual RESET is selected in the menu, the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continue to be displayed, even when the measured variable reaches a permissible value again. This stored fault condition can be reset by pressing the Back key and confirming with the Enter key.

#### 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.

#### Selection and ordering data

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

Multi-unit packaging,  
see page 16/7.



3UG5625-1CW30



3UG5625-2CW30

Measurable current	Control supply voltage at AC at 50 Hz	at 60 Hz	at DC	Number of CO contacts with delayed switching	Screw terminals	Spring-loaded terminals (push-in)
mA	V	V	V		Article No.	Article No.

#### Digitally adjustable residual current monitoring relays

##### Monitoring of residual current, external power supply with auxiliary voltage

30 ... 40 000	24 ... 240	24 ... 240	24 ... 240	2	
• For IO-Link					3UG5625-1CW30

30 ... 40 000	--	--	24 ... 24	1	3UG5825-1AA40
---------------	----	----	-----------	---	---------------

3UG5625-1CW30

3UG5625-2CW30

3UG5825-1AA40

3UG5825-2AA40

Accessories, see page 10/115.

For the 3UL23 residual-current transformers, see page 10/101.

## 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 according to DIN VDE 0100-530/IEC TR 60755).

Together with the 3UG5625 residual current monitoring relays or the 3UG5825 IO-Link version 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 of 35 and 55 mm can be mounted in conjunction with the 3UL2900 accessories on a TH 35 DIN rail according to IEC 60715.

## Selection and ordering data

Diameter of the feed-through opening	Rated residual current	Connectable cross-section of the connecting terminal	Screw terminals	PU (UNIT, SET, M)	PS*	PG
mm	mm <sup>2</sup>		Article No.	Price per PU		
<b>Residual-current transformers (essential accessories for 3UG5625, 3UG5825 and 3UF75, 3UF76 and 3UF80)</b>						
35	30 mA ... 40 A	2.5	<b>3UL2302-1A</b>	1	1 unit	41H
55	30 mA ... 40 A	2.5	<b>3UL2303-1A</b>	1	1 unit	41H
80	30 mA ... 40 A	2.5	<b>3UL2304-1A</b>	1	1 unit	41H
105	30 mA ... 40 A	2.5	<b>3UL2305-1A</b>	1	1 unit	41H
140	30 mA ... 40 A	2.5	<b>3UL2306-1A</b>	1	1 unit	41H
210	30 mA ... 40 A	4	<b>3UL2307-1A</b>	1	1 unit	41H

## Accessories

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
<b>Adapters</b>					
	<b>3UL2900</b>	1	1 unit	41H	

### Adapters

For mounting on DIN rail for 3UL23 to diameter 55 mm

3UL2900

## Monitoring and control devices

### Relays

SIRIUS 3UG monitoring relays for stand-alone installation

#### Level monitoring **NEW**

##### Overview



SIRIUS 3UG5501 monitoring relays

The 3UG5501 level monitoring relay is used in combination with 2-pole or 3-pole sensors to monitor the levels of conductive liquids.

The 3UG5501 relay is available as a version with SIL 1/PL c.

##### Benefits

- Can be used worldwide thanks to wide voltage range from 24 to 240 V
- 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 0.5 to 500 kΩ
- Compensation for wave movements through tripping delay times from 0.5 to 30 s
- Upstream or downstream function selectable
- Devices with Safety certification according to SIL 1/PL c
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-loaded terminals (push-in)

##### Application

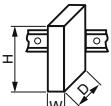
- Single-point and two-point level monitoring
- Overflow protection
- Dry-running protection
- Leak monitoring
- Applications according to the German Water Resources Act

## Technical specifications

### More information

Technical specifications, see  
<https://support.industry.siemens.com/cs/ww/en/ps/25412/td>

Equipment Manual, see  
<https://support.industry.siemens.com/cs/document/109814940>  
FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/25412/faq>

Article number	3UG5501-AW30	3UG5501-AW31
<b>General data</b>		
Width x height x depth	mm 	22.5 x 100 x 90
Ambient temperature		
• During operation	°C -25 ... +60	
• During storage	°C -40 ... +80	
• During transport	°C -40 ... +80	
Degree of protection IP	IP20	
Mounting position	Any	
Installation altitude at height above sea level, maximum	m 2 000	
Electrical endurance (operating cycles) for AC-15 at 230 V typical	100 000	
Mechanical endurance (operating cycles), typical	10 000 000	
Adjustable ON-delay time on upper or lower limit violation	s 0.5 ... 30	
Performance Level (PL) according to ISO 13849-1	--	PL c
Safety Integrity Level (SIL) according to IEC 62061	--	SIL 1
Vibration resistance according to IEC 60068-2-6	$f = 4 \dots 5.81 \text{ Hz}$ , $d_{\max} = 15 \text{ mm}$ ; $f = 5.81 \dots 500 \text{ Hz}$ , $A_{\max} = 20 \text{ m/s}^2$ ; 10 cycles	
Shock resistance according to IEC 60068-2-27	g/ms	Half-sine wave 15/11
Electromagnetic compatibility	IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4	
Electrical separation between input and output	Yes	
Insulation voltage for overvoltage category III according to IEC 60664		
• For pollution degree 3	V 300	
Impulse withstand voltage	kV 6	
<b>Measuring circuit</b>		
Measuring electrode voltage, maximum	V 3.5	
<b>Control circuit</b>		
Number of CO contacts with delayed switching	1	
Thermal current of the non-solid-state contact blocks, maximum	A 5	
<b>Current-carrying capacity of the output relay</b>		
• At AC-15 at 400 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	

Article number	3UG5501-1AW3.	3UG5501-2AW3.
Type of electrical connection	 Screw terminals	 Spring-loaded terminals (push-in)
Tightening torque	0.6 ... 0.8 Nm	--
Type of connectable conductor cross-sections		
• Solid	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 4 mm <sup>2</sup> )
• Finely stranded	--	1 x (0.5 ... 4 mm <sup>2</sup> )
- Without end sleeves	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 2.5 mm <sup>2</sup> )
- With end sleeve		
• For AWG cables	1 x (20 ... 12), 2 x (20 ... 14)	1 x (20 ... 12)
- Solid	--	1 x (20 ... 12)
- Stranded		

# Monitoring and control devices

## Relays

### SIRIUS 3UG5 monitoring relays for stand-alone installation

#### Level monitoring **NEW**

##### **3UG5501 monitoring relays**

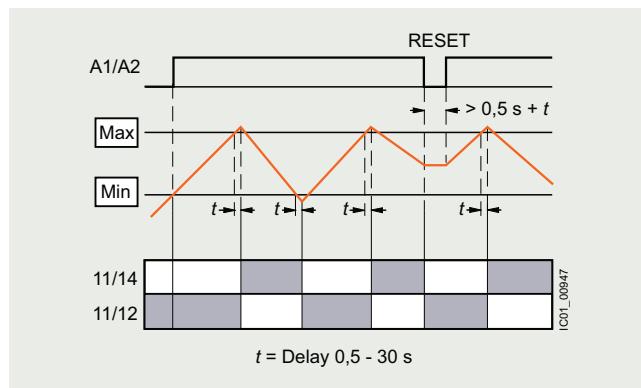
The principle of operation of the 3UG5501 level monitoring relay is based on measuring the electrical resistance of the liquid between two immersion sensors and a reference terminal. If the measured value is lower than the sensitivity set on the front, the output relay changes its switching state. In order to preclude active current undershooting of the liquid, the sensors are supplied with alternating current.

The level monitoring relay is also available as a version with SIL 1/PL c certification and for inflow control according to the German Water Resources Act (WHG). With these devices, it is possible to use sensors with an internal parallel resistor both to monitor the connection to the sensor and to detect a cable break.

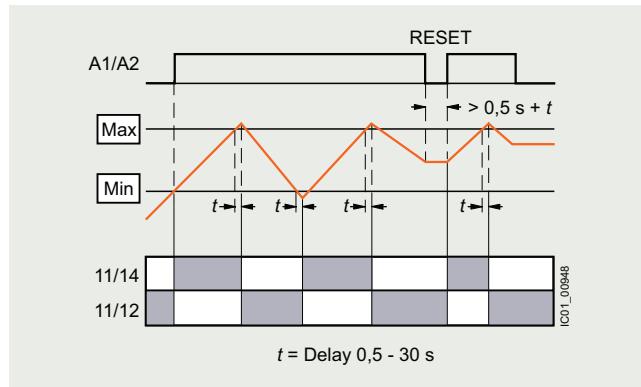
##### Two-point control

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.

##### Outflow control, two-point control



##### Inflow control, two-point control



##### Note:

It is also possible to connect other resistance sensors to the Min and Max terminals in the range 0.5 to 500 kΩ, 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.

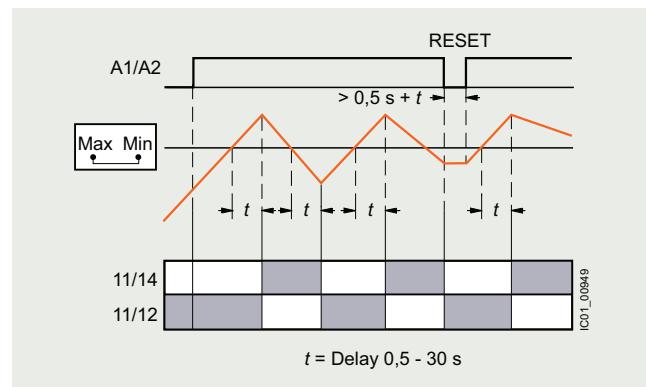
##### Single-point control

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.

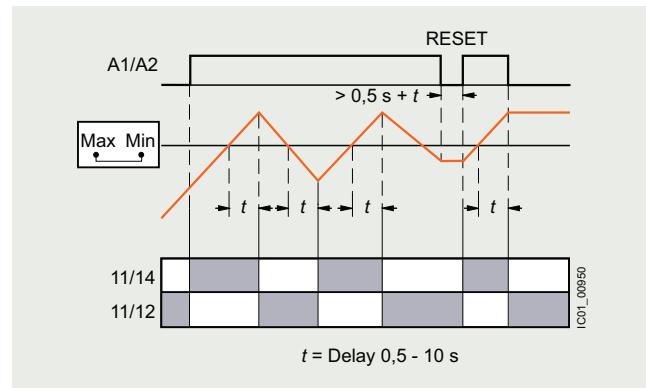
In order to prevent premature tripping of the switching function caused by wave motion or frothing, even though the set level has not been reached, it is possible to delay this function by 0.5 to 30 s.

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

##### Outflow control, single-point control

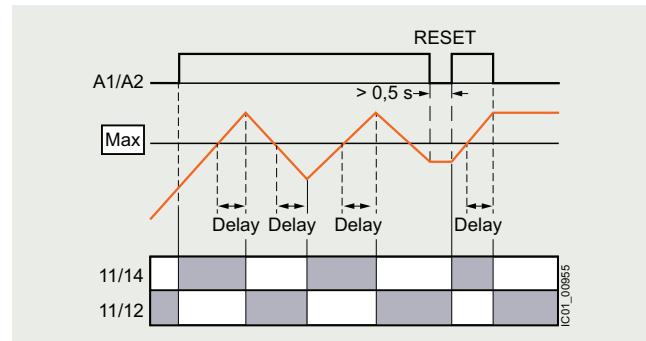


##### Inflow control, single-point control



In the WHG (German Water Resources Act) monitoring type, only single-point control is possible.

##### Single-point control for monitoring type WHG



## Selection and ordering data

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

Multi-unit  
packaging,  
see page 16/7.



3UG5501-1AW30



3UG5501-2AW30

Control supply voltage at AC at 50 Hz	at DC at 60 Hz	Number of CO contacts with delayed switching	Screw terminals	Spring-loaded terminals (push-in)
V	V	V	Article No.	Price per PU
<b>Analogically adjustable level monitoring relays</b>				
<b>Monitoring level, external power supply with auxiliary voltage</b>				
24 ... 240	24 ... 240	24 ... 240	1	3UG5501-1AW30
• For safety applications				3UG5501-2AW30
24 ... 240	24 ... 240	24 ... 240	1	3UG5501-1AW31
				3UG5501-2AW31

Accessories, [see page 10/115](#).

### Note:

Sensors for level monitoring, [see SiePortal](#).

These must be used to apply the devices according to WHG (German Water Resources Act). For the Safety versions, it is necessary to use sensors with a parallel resistor. We recommend use of our sensors.

## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

Speed monitoring **NEW**

#### Overview



SIRIUS 3UG5651 monitoring relays

The 3UG5651 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).

The 3UG5851 device is available as a version for IO-Link. Moreover, there is a 3UG5651 version with SIL 1/PL c.

#### Benefits

- Can be used worldwide thanks to wide voltage range from 24 to 240 V
- 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
- Two-wire or three-wire sensors and sensors with a mechanical switching output or solid-state output can be connected
- Auxiliary voltage for sensor integrated
- Devices with Safety certification according to SIL 1/PL c
- Communication via IO-Link with the SIRIUS 3UG5851 relay as well as display and transmission of actual values and diagnostics to the controller
- Width 22.5 mm
- All versions with removable terminals
- All versions with screw or spring-loaded terminals (push-in)

#### Application

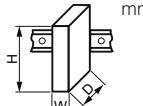
- Slip or tear of a belt drive
- Overload monitoring
- Transport monitoring for completeness

## Technical specifications

## More information

Technical specifications, see  
<https://support.industry.siemens.com/cs/ww/en/ps/25412/td>

Equipment Manual, see  
<https://support.industry.siemens.com/cs/document/109814940>  
 FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/25412/faq>

Article number	3UG5651-CW30	3UG5651-CW31	3UG5851-AA40	
<b>General data</b>				
Width x height x depth	mm 	22.5 x 100 x 90		
Ambient temperature				
• During operation	°C	-25 ... +60		
• During storage	°C	-40 ... +80		
• During transport	°C	-40 ... +80		
Degree of protection IP	IP20			
Mounting position	Any			
Installation altitude at height above sea level, maximum	m	2 000		
Electrical endurance (operating cycles) for AC-15 at 230 V typical		100 000		
Mechanical endurance (operating cycles), typical		10 000 000		
Adjustable ON-delay time				
• On starting	s	0 ... 999.9		
• On upper or lower limit violation	s	0 ... 999.9		
Vibration resistance according to IEC 60068-2-6		$f = 4 \dots 5.81 \text{ Hz}, d_{\max} = 15 \text{ mm}; f = 5.81 \dots 500 \text{ Hz}, A_{\max} = 20 \text{ m/s}^2$ ; 10 cycles		
Shock resistance according to IEC 60068-2-27	g/ms	Half-sine wave 15/11		
Electromagnetic compatibility		IEC 60947-1/IEC 61000-6-2/IEC 61000-6-4		
Performance Level (PL) according to ISO 13849-1	--	PL c	--	
Safety Integrity Level (SIL) according to IEC 62061	--	SIL 1	--	
Electrical separation between input and output		Yes		
IO-Link protocol is supported	--		Yes	
<b>Measuring circuit</b>				
Input current at digital input 1, maximum	mA	--	50	
<b>Control circuit</b>				
Number of CO contacts with delayed switching		2	1	
Thermal current of the non-solid-state contact blocks, maximum	A	5		
<b>Current-carrying capacity of the output relay</b>				
• At AC-15 at 400 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		
Article number	3UG5651-1.... 3UG5851-1....	3UG5651-2...., 3UG5851-2....		
Type of electrical connection		Screw terminals		Spring-loaded terminals (push-in)
Tightening torque		0.6 ... 0.8 Nm	--	
<b>Type of connectable conductor cross-sections</b>				
• Solid		1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	--	
• Finely stranded		--		
- Without end sleeves		1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> )	1 x (0.5 ... 4 mm <sup>2</sup> )	1 x (0.5 ... 2.5 mm <sup>2</sup> )
- With end sleeve				
• For AWG cables		1 x (20 ... 12), 2 x (20 ... 14)	1 x (20 ... 12)	
- Solid		--	1 x (20 ... 12)	
- Stranded			1 x (20 ... 12)	

## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### Speed monitoring **NEW**

##### **3UG5651 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 revolutions per minute.

It is also possible to implement the function of a meter with the relay.

##### 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 OK 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 automatic RESET (Reset = AUTO)

If the device is set to automatic RESET, the output relay switches to the OK 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 (Reset = Manual)

If manual RESET is selected in the menu, the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continue to be displayed, even when the measured variable reaches a permissible value again. This stored fault condition can be reset by pressing the Back key and confirming with the Enter key.

The device is also available as a version with SIL 1/PL c certification.

##### **3UG5851 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 revolutions per minute.

It is also possible to implement the function of a meter with the relay.

##### 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 OK 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 automatic RESET (Reset = AUTO)

If the device is set to automatic RESET, the output relay switches to the OK 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.

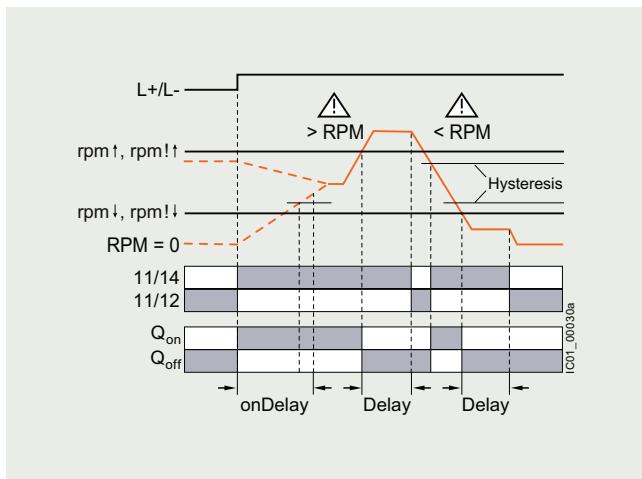
##### Speed monitoring with manual RESET (Reset = Manual)

If manual RESET is selected in the menu, the switching relay remains in its current switching state and the current measured value and the symbol for undershooting and overshooting continue to be displayed, even when the measured variable reaches a permissible value again. This stored fault condition can be reset by pressing the Back key and confirming with the Enter key.

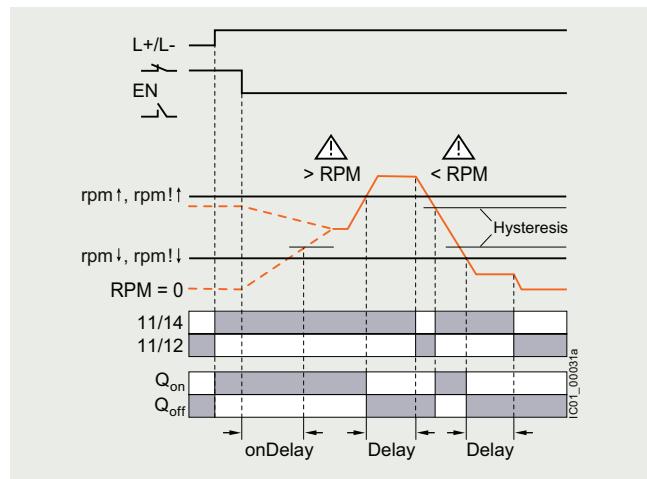
With manual RESET through IO-Link it is possible in addition to set whether fault messages are to be deleted when the control supply voltage is switched off and on (as remote RESET) or whether the signals are to be permanently saved even in a voltage failure, with confirmation possible only through local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

With the closed-circuit principle selected

Range monitoring without enable input



Range monitoring with enable input



### Selection and ordering data

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

Multi-unit packaging,  
see page 16/7.



3UG5651-1CW30



3UG5651-2CW30

Control supply voltage at AC 50 Hz	at DC	Number of CO contacts with delayed switching	Screw terminals	Spring-loaded terminals (push-in)		
V	V		Article No.	Price per PU	Article No.	Price per PU
<b>Digitally adjustable speed monitoring relays</b>						
<b>Monitoring of speed, external power supply with auxiliary voltage</b>						
24 .. 240	24 .. 240	24 .. 240	2	3UG5651-1CW30	3UG5651-2CW30	
• For safety applications				3UG5651-1CW31	3UG5651-2CW31	
24 .. 240	24 .. 240	24 .. 240	2			
• For IO-Link				3UG5851-1AA40	3UG5851-2AA40	
--	--	24 ... 24	1			

Accessories, see page 10/115.

## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### DC load monitoring

##### Overview



SIRIUS 3UG546 DC load monitoring relays

##### More information

Homepage, see [www.siemens.com/sirius-monitoring-relays](http://www.siemens.com/sirius-monitoring-relays)

SiePortal, see [www.siemens.com/product?3UG5](http://www.siemens.com/product?3UG5)

The SIRIUS 3UG546 DC load monitoring relays are suitable for monitoring motors, batteries and other DC equipment. They are also suitable for applications where batteries are used. The devices monitor the direct current, voltage and actual power for overshooting or undershooting of the set limit values in 1 or 2 channels. The relays have a CO contact output for alarms and operate on the closed-circuit principle (NC).

The devices are parameterized via PROFINET, and transfer the measured values and diagnostic messages to a controller. Besides providing detailed fault diagnostics, the integrated energy counters, operating hours counters, and operating cycles counters can also be read out and reset.

When metering energy consumption, the SIRIUS 3UG546 DC load monitoring relays distinguish the direction of current flow and can thus, for example, separately sense the quantities of energy stored in or drawn from a battery.

Features	3UG5461-1AA4., 3UG5462-1AA4.
<b>DC monitoring</b>	
Monitoring the direct current for undershoot	✓
Monitoring the direct current for overshoot	✓
Range monitoring	✓
<b>Voltage monitoring</b>	
Monitoring the voltage for undershoot	✓
Monitoring the voltage for overshoot	✓
Range monitoring	✓
<b>Power monitoring</b>	
Monitoring the power for undershoot	✓
Monitoring the power for overshoot	✓
Range monitoring	✓
<b>Delay times</b>	
ON-delay	✓
Tripping delay	✓
<b>Operating hours counter</b>	
Monitoring for overshoot	✓
<b>Operating cycles counter</b>	
Monitoring for overshoot	✓
<b>Energy recovery counter</b>	
Monitoring for overshoot	✓
<b>Energy consumption counter</b>	
Monitoring for overshoot	✓
<b>PROFINET IO functions</b>	
Ethernet services	✓
Port diagnostics	✓
Minimum update time	2 ms
Resetting of communication parameters to factory settings	✓
PROFINET RT (real-time communication)	✓
Firmware update via PROFINET IO	✓
I&M identification data 0 to 3	✓

✓ Available

##### Benefits

- Wide voltage measuring range of up to 800 V
- 60 V version, in particular for applications where batteries are used
- Detection and monitoring of current, voltage and power in a single device
- Detailed fault diagnostics
- Energy metering with distinction of direction of current flow

- Communication and visualization via PROFINET and thus quick and easy integration for visualizing plant energy values
- Integration in the TIA Portal
- Widths 22.5 and 45 mm
- Customary screw terminals for quick and reliable wiring
- Device replacement without renewed wiring thanks to removable terminals

##### Application

- Exhaustive discharge protection on battery-operated vehicles
- Acquisition of energy flows, including energy recovery, e.g. for robots
- DC line monitoring
- DC heaters
- Lighting systems
- Energy management
- Condition monitoring

## Technical specifications

### More information

Technical specifications, see  
<https://support.industry.siemens.com/cs/ww/en/ps/25412/td>

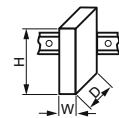
Equipment Manual,  
 see <https://support.industry.siemens.com/cs/ww/en/ps/25412/man>  
 FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/25412/faq>

Article number

3UG5461-1AA40 3UG5461-1AA41 3UG5462-1AA40 3UG5462-1AA41

### General technical specifications

#### Dimensions (W x H x D)



22.5 x 100 x 141.6

45 x 100 x 141.6

#### Type of electrical separation

Protective separation

#### Electrical endurance (operating cycles) for relay outputs, maximum

100 000, 0.5 A, 125 V AC, for resistive load up to 40 °C

#### Mechanical endurance (operating cycles), typical

10 000 000

#### Power loss [W], maximum

W

3

#### Adjustable response value current 1

A

-8 ... +8

-63 ... +63

#### Adjustable response value current 2

A

-8 ... +8

--

#### Adjustable ON-delay time

- On starting
- On upper or lower limit violation

s

0 ... 999

s

0 ... 999

#### Adjustable voltage range

V

0 ... 800

0 ... 60

0 ... 800

0 ... 60

#### Minimum supply voltage failure buffering time

ms

10

#### Reaction time, maximum

ms

100

#### Degree of protection IP on the front according to IEC 60529

IP20

#### Touch protection on the front according to IEC 60529

Finger-safe

Finger-safe for vertical touching from the front

#### Type of mounting

- Mounting position

Screw and snap-on mounting on 35 mm DIN rail

Any

#### Installation altitude at height above sea level, maximum

m

2 000

#### Ambient temperature

- During operation
- During storage

°C

-25 ... +60

°C

-40 ... +80

#### Relative temperature-related measurement deviation

%

0.5

#### Number of ports at the interface 1

1

#### Product function

- Operating cycles counter
- Operating hours counter
- Automatic RESET
- Manual RESET
- Overvoltage detection DC
- Overcurrent detection DC
- Undervoltage detection DC
- Undercurrent detection DC

Yes

Yes

Yes

Yes

Yes

Yes

Yes

Yes

#### Product component

- Removable terminal for main circuit
- Removable terminal for auxiliary and control circuit

Yes

Yes

No

#### Measuring circuit

##### Relative measurement accuracy with reference to the upper range value

%

2

##### Number of CO contacts for auxiliary contacts

1

#### Control circuit

##### Current-carrying capacity of the output relay at DC-13 at 24 V

A

1

##### Thermal current of the non-solid-state contact blocks, maximum

A

1

##### Type of voltage for monitoring

DC

##### Type of current for monitoring

DC

##### Supply voltage type

DC

##### Supply voltage 1 at DC

V

24

##### Supply voltage

##### Operating range factor of the supply voltage, rated value at DC

0.85 ... 1.15

## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### DC load monitoring

Article number	3UG5461-1AA4.	3UG5462-1AA4.
<b>Type of electrical connection</b>	 Screw terminals	
<b>Connectable conductor cross-section for auxiliary contacts</b>	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> ) 1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 1.5 mm <sup>2</sup> ) 1 x (20 ... 12 mm <sup>2</sup> ), 2 x (20 ... 14 mm <sup>2</sup> )	
<b>Connectable conductor cross-section for main contacts</b>	1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> ) 1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> ) 1 x (0.5 ... 4 mm <sup>2</sup> ), 2 x (0.5 ... 2.5 mm <sup>2</sup> ) 1 x (20 ... 12), 2 x (20 ... 14)	1 x (1 ... 16 mm <sup>2</sup> ), 2 x (1 ... 16 mm <sup>2</sup> ) 1 x (1 ... 35 mm <sup>2</sup> ), 2 x (1 ... 25 mm <sup>2</sup> ) 1 x (1 ... 16 mm <sup>2</sup> ), 2 x (1 ... 16 mm <sup>2</sup> ) 1 x (18 ... 1), 2 x (18 ... 2)

The SIRIUS 3UG546 DC load monitoring relays monitor a DC load current circuit for undershooting or overshooting of set limit values in 1 or 2 channels. Current, voltage, and power can be monitored separately. When the relays measure the current, they also detect the direction of current and have separate counters for measuring energy consumption and energy recovery.

The devices count the operating cycles and the operating hours of the connected loads as well as the operating cycles of the internal relay. All counters can be monitored for settable limit values and the counter statuses can be reset (with the exception of the operating cycle counter of the internal relay).

The SIRIUS 3UG546 DC load monitoring relays are parameterized exclusively via a PROFINET interface. All measured values and counter values as well as other diagnostics data are transmitted to a controller via PROFINET. The relays can also be operated without PROFINET. If communication fails, the monitoring function continues to be reliably executed. The internal relay, which is switched as a signaling output that responds when a set limit value is undershot or overshot, responds to detected system faults.

All monitored counter values and measured values can be additionally assigned a warning limit, which generates an alarm via PROFINET when the set value is undershot or overshot. Violations of the set limit values are also signaled as an alarm via PROFINET.

The devices are supplied via an external 24 V DC voltage source.

The integral counters for operating hours and operating cycles support operators in requirement-oriented preventive plant maintenance. The operating hours counter outputs the time during which a measurable current flows. The properties of the insulation material of the motor windings, for example, deteriorate during operation due to the thermal load. The operating hours serve as an indicator of upcoming preventive maintenance or replacement of machine parts and system components.

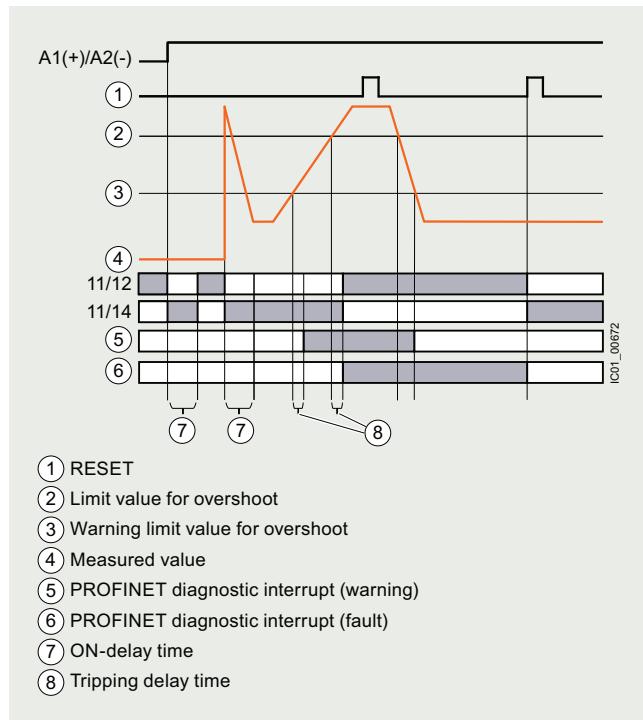
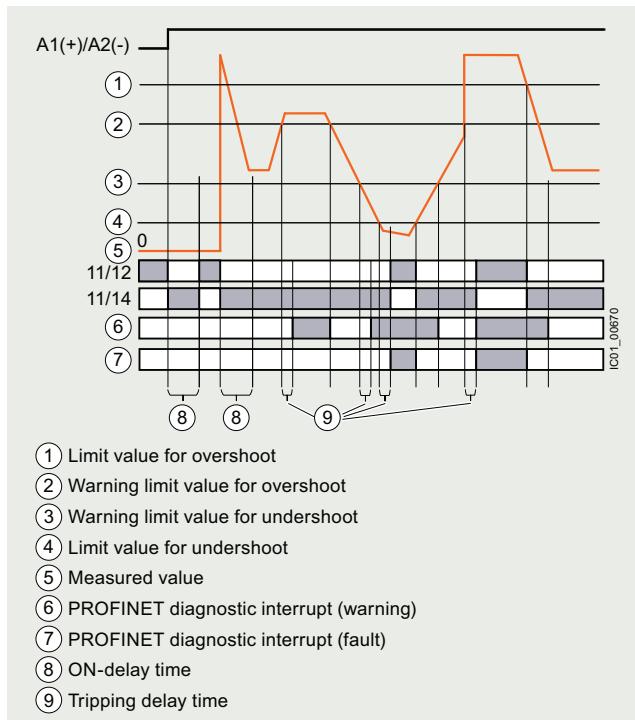
The operating cycles counter is incremented by one each time a breaking operation of the monitored load is detected (transition from current flow to no measurable current flow). The number of operating cycles serves as an indicator of upcoming preventive maintenance or replacement of contact blocks. Arcs in breaking operations cause high loads and wear in particular in DC current circuits.

## DC load monitoring

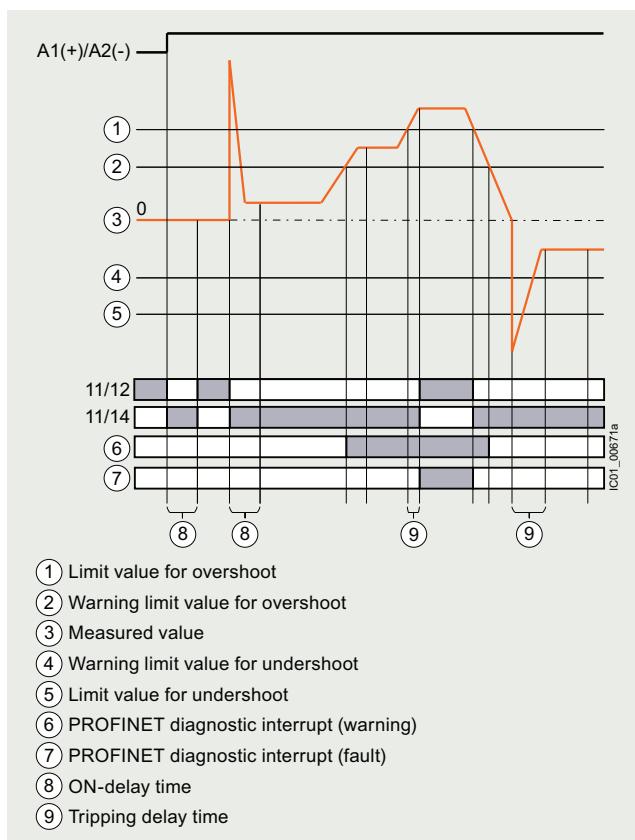
With the closed-circuit principle selected upon application of the control supply voltage

Monitoring for overshooting and undershooting of a measured value including parameterized warning limit/current flow in one direction only/automatic RESET

Monitoring for overshooting of a measured value including parameterized warning limit/manual RESET



Monitoring for overshooting and undershooting of a measured value including parameterized warning limit/current flow in both directions (energy consumption and energy recovery)/ automatic RESET



## Monitoring and control devices

### Relays

SIRIUS 3UG5 monitoring relays for stand-alone installation

#### DC load monitoring

##### Selection and ordering data



3UG5461-1AA40



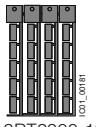
3UG5462-1AA40

Measurable voltage	Measurable current	Width	Screw terminals	PU (UNIT, SET, M)	PS*	PG
V	A	mm	Article No.	Price per PU		
<b>DC load monitoring relay</b>						
• For PROFINET						
0 ... 800	2 x 8/1 x 16	22.5	<b>3UG5461-1AA40</b>	1	1 unit	41H
	1 x 63	45	<b>3UG5462-1AA40</b>	1	1 unit	41H
0 ... 60	2 x 8/1 x 16	22.5	<b>3UG5461-1AA41</b>	1	1 unit	41H
	1 x 63	45	<b>3UG5462-1AA41</b>	1	1 unit	41H

Accessories, [see page 10/115](#).

## Accessories

## Selection and ordering data

Version	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
<b>Terminals for SIRIUS devices in the industrial DIN-rail enclosure</b>					
	<b>Screw terminals</b> 3ZY1122-1BA00			1	6 units
3ZY1122-1BA00	• 2-pole, up to 1 x 4 mm <sup>2</sup> or 2 x 2.5 mm <sup>2</sup>				41L
	<b>Spring-loaded terminals (push-in)</b> 3ZY1122-2BA00			1	6 units
3ZY1122-2BA00	• 2-pole, up to 1 x 4 mm <sup>2</sup> or 2 x 1.5 mm <sup>2</sup> (in shared end sleeve)				41L
<b>Accessories for enclosures</b>					
	<b>Push-in lugs for wall mounting</b> (Two lugs are required per device) 3ZY1311-0AA00	<b>3ZY1311-0AA00</b>		1	10 units
3ZY1311-0AA00					41L
	<b>Coding pins</b> For removable terminals of SIRIUS devices in the industrial DIN-rail enclosure; enable the mechanical coding of terminals 3ZY1440-1AA00	<b>3ZY1440-1AA00</b>		1	12 units
3ZY1440-1AA00					41L
	<b>Hinged covers</b> Replacement cover, without terminal labeling, titanium gray • 22.5 mm wide 3ZY1450-1AB00	<b>3ZY1450-1AB00</b>		1	5 units
3ZY1450-1AB00					41L
	<b>Sealable covers</b> Replacement cover, without terminal labeling, titanium gray • 22.5 mm wide 3ZY1321-2AA00	<b>3ZY1321-2AA00</b>		1	5 units
3ZY1321-2AA00					41L
	<b>Push-in lugs</b> For screw fixing, 2 units are required for each device 3RP1903	<b>3RP1903</b>		1	10 units
3RP1903					41H
<b>Blank labels</b>					
	<b>Unit labeling plates<sup>1)</sup></b> For SIRIUS devices • 20 mm x 7 mm, titanium gray 3RT2900-1SB20	<b>3RT2900-1SB20</b>		100	340 units
3RT2900-1SB20					41B
<b>Tools for opening spring-loaded terminals</b>					
	<b>Screwdriver</b> For all SIRIUS devices with spring-loaded terminals Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated 3RA2908-1A	<b>Spring-loaded terminals (push-in)</b> 3RA2908-1A		1	1 unit
3RA2908-1A					41B

<sup>1)</sup> PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH, see page 16/18.

## Note:

For products for mechanical bearing monitoring, e.g. condition monitoring systems, see [www.siemens.com/siplus-cms](http://www.siemens.com/siplus-cms).