General data

Overview

SIRIUS 3UG4 monitoring relay

The field-proven SIRIUS monitoring relays for electrical and mechanical variables enable constant monitoring of all important characteristic quantities that provide information about the functional capability of a plant. Both sudden disturbances and gradual changes, which may indicate the need for maintenance, are detected. Thanks to their relay outputs, the monitoring relays permit direct disconnection of the affected system components as well as alerting (e.g. by switching a warning lamp). Thanks to adjustable delay times the monitoring relays can respond very flexibly to brief faults such as voltage dips or load changes. This avoids unnecessary alarms and disconnections while enhancing plant availability.

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

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

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th
	□□□	□	□	□	□	–	□	□	□	□	□
Monitoring relays	**3 U G**										
Generation		□									
Type of setting			□								
Functions				□	□						
Connection methods							□				
Contacts								□			
Supply voltage									□		
Signal type of the control supply voltage										□	
Special version											□
Example	**3 U G**	**4**	**5**	**1**	**1**	**–**	**1**	**A**	**N**	**2**	**0**

Notes:

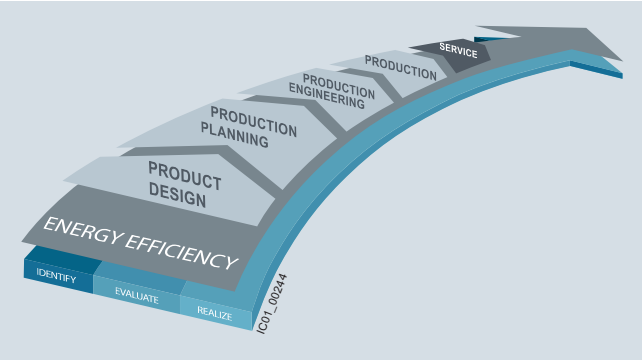
The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

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

Benefits

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

Advantages through energy efficiency



Overview of the energy management process

We offer you a unique portfolio for industrial energy management, using an energy management system that helps to optimally define your energy needs. We split up our industrial energy management into three phases – identify, evaluate, and realize – and we support you with the appropriate hardware and software solutions in every process phase.

The innovative SIRIUS industrial controls products can also make a major contribution to the energy efficiency of a plant (www.siemens.com/sirius/energysaving).

The 3UG4 monitoring relays contribute to energy efficiency throughout the plant as follows:

- Shutdown in the event of no-load operation (e.g. pump no-load operation)
- Reactive-power compensation by means of power factor monitoring
- Load shedding of predefined loads in the event of current overshoots

Application

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

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

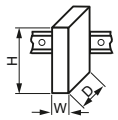
The positive result: More selective avoidance of production faults – sustained increases in availability and productivity.

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

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

General data

Technical specifications

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

More information

Manual "3UG45/3UG46 and 3RR21/3RR22 Monitoring Relays", see http://support.automation.siemens.com/WW/view/en/54397927.

Overview

SIRIUS 3UG4615 monitoring relay

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

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

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

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

Benefits

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

Application

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

Function	Application
Phase sequence	• Direction of rotation of the drive
Phase failure	• A fuse has tripped • Failure of the control supply voltage • Broken cable
Phase asymmetry	• Overheating of the motor due to asymmetrical voltage • Detection of asymmetrically loaded networks
Undervoltage	• Increased current on a motor with corresponding overheating • Unintentional resetting of a device • Network collapse, particularly with battery power
Overvoltage	• Protection of a plant against destruction due to overvoltage

Technical specifications

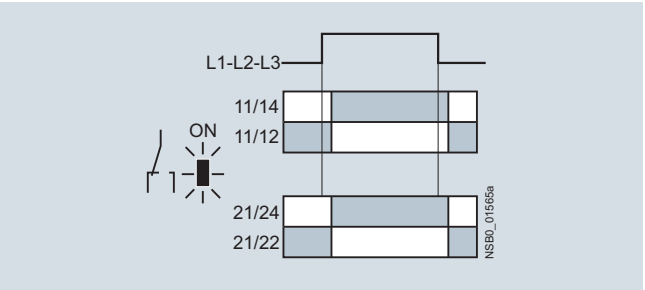
3UG4511 monitoring relays

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

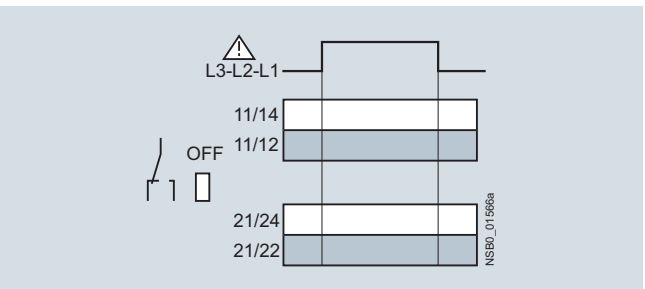
Note:

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

Correct phase sequence



Wrong phase sequence



Line monitoring

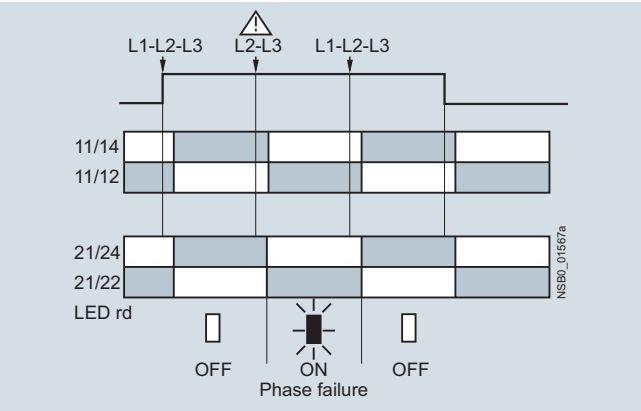
3UG4512 monitoring relays

The 3UG4512 line monitoring relay monitors three-phase networks with regard to phase sequence, phase failure and phase unbalance of 10 %. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V 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. When the mains voltage is switched on, the green LED is lit. If the phase sequence at the terminals L1-L2-L3 is correct, the output relay picks up. If the phase sequence is wrong, the red LED flashes and the output relay remains in its rest position. If a phase fails, the red LED is permanently lit and the output relay drops.

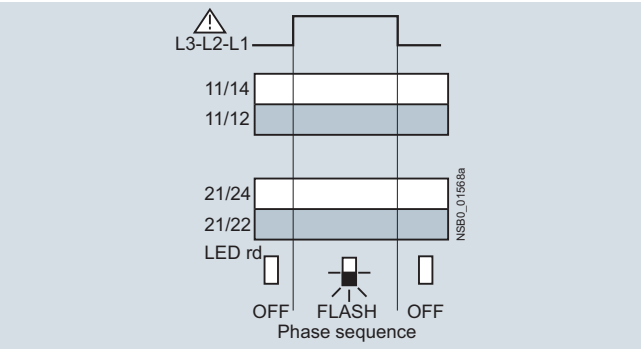
Note:

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

Phase failure



Wrong phase sequence



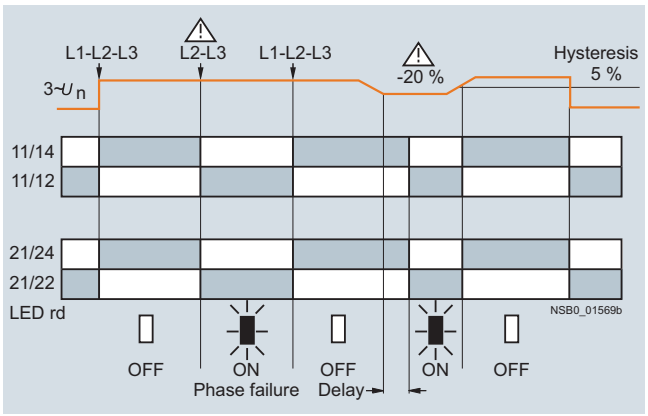
3UG4513 monitoring relays

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

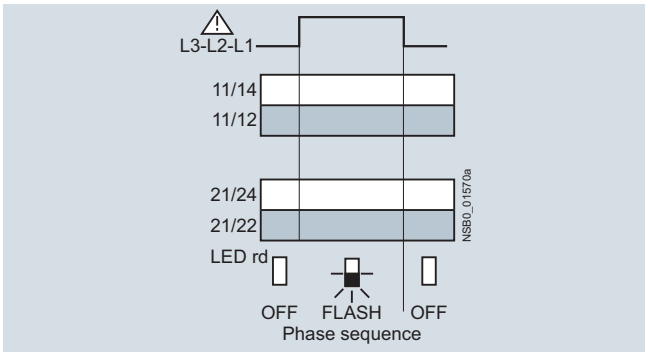
Note:

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

Phase failure and undervoltage



Wrong phase sequence



10

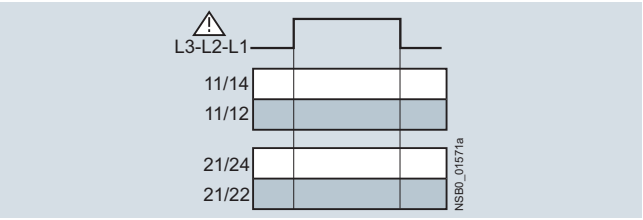
3UG4614 monitoring relays

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

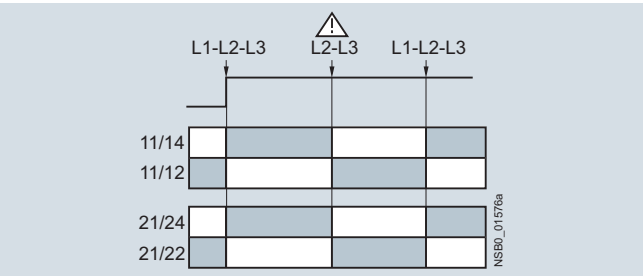
The 3UG4614 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with manual or Auto RESET.

With the closed-circuit principle selected

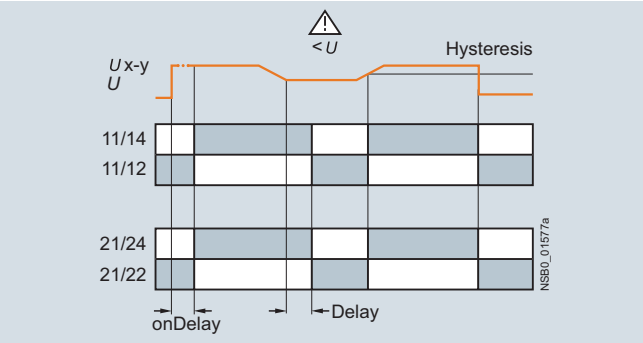
Wrong phase sequence



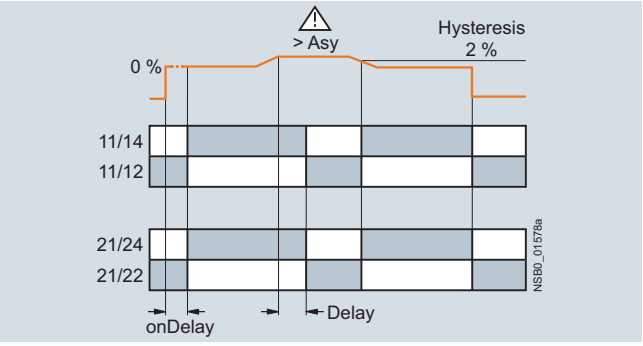
Phase failure



Undervoltage



Unbalance



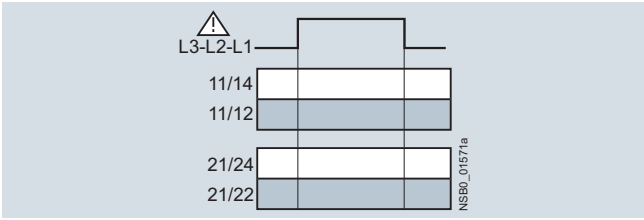
3UG4615/3UG4616 monitoring relays

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

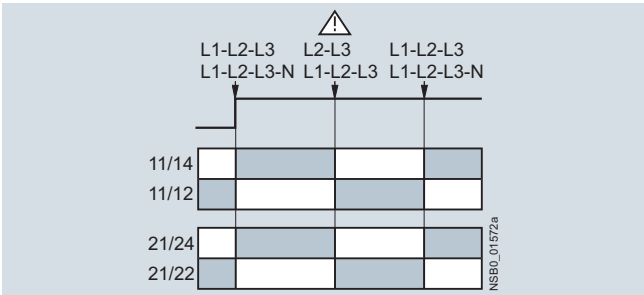
The 3UG4615/3UG4616 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with manual or Auto RESET.

With the closed-circuit principle selected

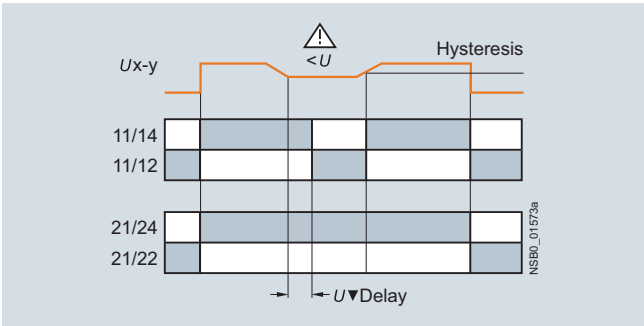
Wrong phase sequence



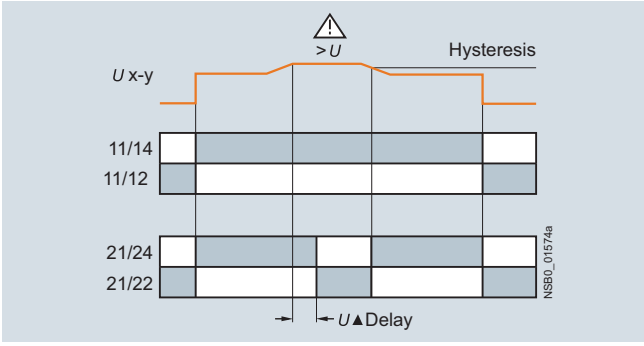
Phase failure



Undervoltage



Overvoltage



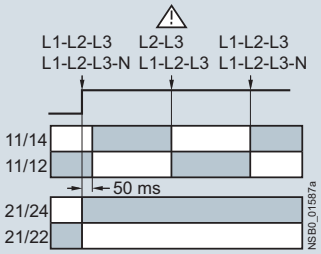
Line monitoring

3UG4617/3UG4618 monitoring relays

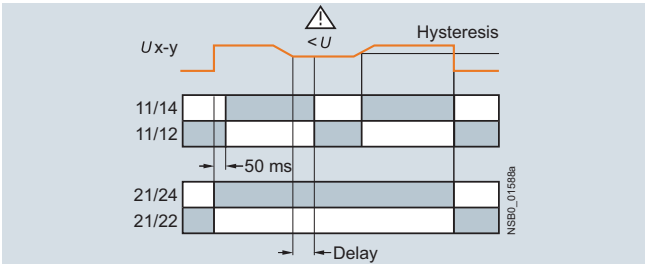
The 3UG4617/3UG4618 line monitoring relay has an internal power supply and can automatically correct a wrong direction of rotation. Thanks to a special measuring method, a phase failure is reliably detected in spite of the wide voltage range from 160 to 690 V AC and feedback through the load of up to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

With the closed-circuit principle selected

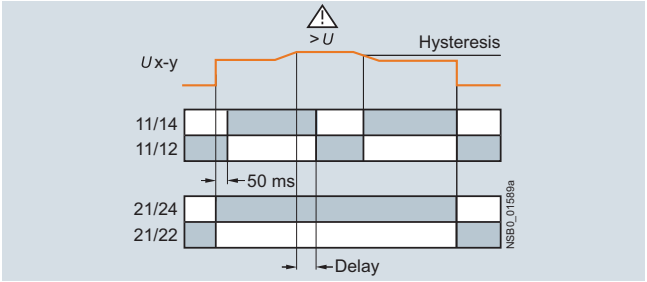
Phase failure



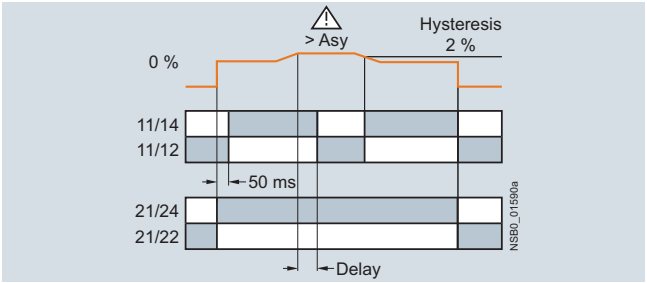
Undervoltage



Overvoltage

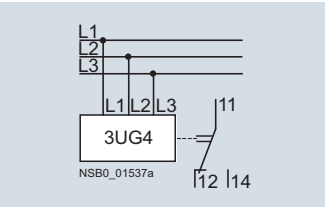


Unbalance

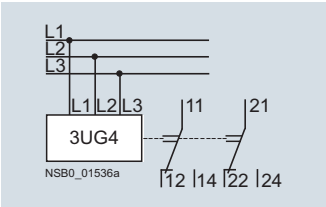


Type			3UG4511 ... 3UG4513, 3UG4614 ... 3UG4618
General data			
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III acc. to VDE 0110		V	690
Rated impulse withstand voltage U_{imp}		kV	6
Control circuit			
Load capacity of the output relay • Conventional thermal current I_{th}		A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

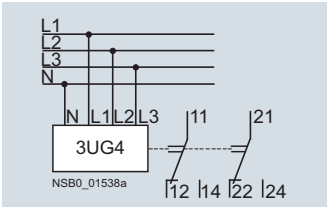
Circuit diagrams



3UG4511-.A,
3UG4512-.A



3UG4511-.B, 3UG4512-.B,
3UG4513, 3UG4614,
3UG4615, 3UG4617



3UG4616,
3UG4618

Note:
It is not necessary to protect the measuring circuit for device protection. The protective device for line protection depends on the cross-section used.

Selection and ordering data

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


3UG4511-1AP20


3UG4615-1CR20


3UG4616-1CR20


3UG4617-1CR20


3UG4618-1CR20


3UG4511-2BP20


3UG4512-2BR20

Adjustable hysteresis	Under-voltage detec-tion	Over-voltage detec-tion	Stabiliza-tion time adjustable stDEL	Tripping delay time adjustable Del	Version of auxiliary contacts	Measurable mains voltage[1]	DT	**Screw terminals** Article No.	Price per PU	DT	**Spring-type terminals** Article No.	Price per PU
			s	s	CO contact	V						
Monitoring of phase sequence												
Auto RESET												
--	--	--	--	--	1	160 … 260 AC	A	**3UG4511-1AN20**		A	**3UG4511-2AN20**	
					2		A	**3UG4511-1BN20**		A	**3UG4511-2BN20**	
					1	320 … 500 AC	A	**3UG4511-1AP20**		A	**3UG4511-2AP20**	
					2		A	**3UG4511-1BP20**		A	**3UG4511-2BP20**	
					1	420 … 690 AC	A	**3UG4511-1AQ20**		B	**3UG4511-2AQ20**	
					2		A	**3UG4511-1BQ20**		B	**3UG4511-2BQ20**	
Monitoring of phase sequence, phase failure and phase unbalance												
Auto RESET, closed-circuit principle, unbalance threshold permanently 10 %												
--	--	--	--	--	1	160 … 690 AC	A	**3UG4512-1AR20**		A	**3UG4512-2AR20**	
					2		A	**3UG4512-1BR20**		A	**3UG4512-2BR20**	
Monitoring of phase sequence, phase failure, unbalance and undervoltage												
Analogically adjustable, Auto RESET, closed-circuit principle, unbalance and undervoltage threshold permanently 20 %												
5 % of set value	✓	--	--	0.1 … 20	2	160 … 690 AC	A	**3UG4513-1BR20**		A	**3UG4513-2BR20**	
Digitally adjustable, Auto or Manual RESET, open-circuit or closed-circuit principle, unbalance threshold 0 or 5 ... 20 %												
Adjustable 1 ... 20 V	✓	--	0.1 ... 20	0.1 … 20	2	160 … 690 AC	A	**3UG4614-1BR20**		A	**3UG4614-2BR20**	
Monitoring of phase sequence, phase failure, overvoltage and undervoltage												
Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle												
Adjustable 1 ... 20 V	✓	✓	--	0.1 … 20[2]	2[2]	160 … 690 AC	A	**3UG4615-1CR20**		A	**3UG4615-2CR20**	
Monitoring of phase sequence, phase and N conductor failure, overvoltage and undervoltage												
Digitally adjustable, Auto RESET or Manual RESET, open-circuit or closed-circuit principle												
Adjustable 1 ... 20 V	✓	✓	--	0.1 … 20[2]	2[2]	90… 400 AC against N	A	**3UG4616-1CR20**		A	**3UG4616-2CR20**	
Automatic direction correction in case of wrong phase sequence, phase failure, phase unbalance, overvoltage and undervoltage												
Digitally adjustable, Auto or Manual RESET, open-circuit or closed-circuit principle, unbalance threshold 0 or 5 ... 20 %												
Adjustable 1 ... 20 V	✓	✓	--	0.1 … 20	2[3]	160 … 690 AC	A	**3UG4617-1CR20**		A	**3UG4617-2CR20**	
Automatic correction of the direction of rotation in case of wrong phase sequence, phase and N conductor failure, phase unbalance, overvoltage and undervoltage												
Digitally adjustable, Auto or Manual RESET, open-circuit or closed-circuit principle, unbalance threshold 0 or 5 ... 20 %												
Adjustable 1 ... 20 V	✓	✓	--	0.1 … 20	2[3]	90 … 400 AC against N	A	**3UG4618-1CR20**		A	**3UG4618-2CR20**	

✓ Function available
-- Function not available

[1] Absolute limit values.
[2] 1 CO contact each and 1 tripping delay time each for U_{min} and U_{max}.
[3] 1 CO contact each for power system fault and phase sequence correction.

For accessories, see page 10/132.

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