

# Monitoring Relays

## 3UG Monitoring Relays for Electrical and Additional Measurements

### Line monitoring

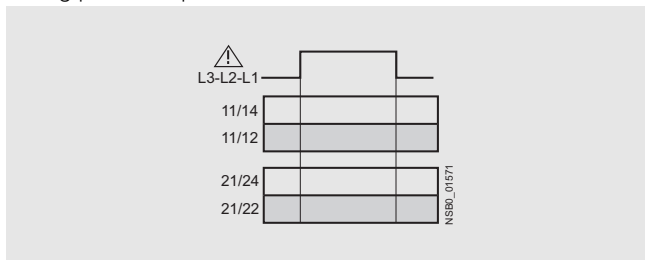
#### 3UG46 15/3UG46 16 monitoring relays

The 3UG46 15/3UG46 16 line monitoring relay has a wide voltage range and an internal power supply. The device is equipped with a display and is parameterized using three buttons. The 3UG46 15 device monitors three-phase networks with regard to phase failure, undervoltage, overvoltage and phase sequence. The 3UG46 16 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 AC and feedback through the load of up to 80 %.

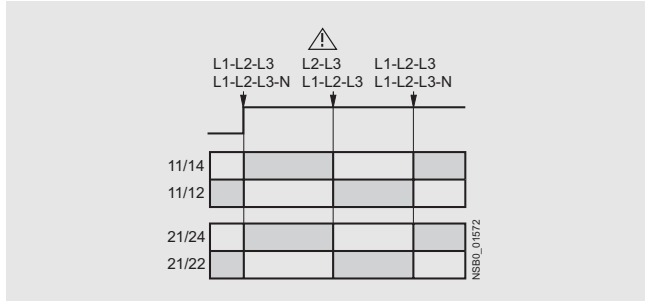
The 3UG46 15/ 3UG46 16 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with manual or auto RESET.

#### With the closed-circuit principle selected

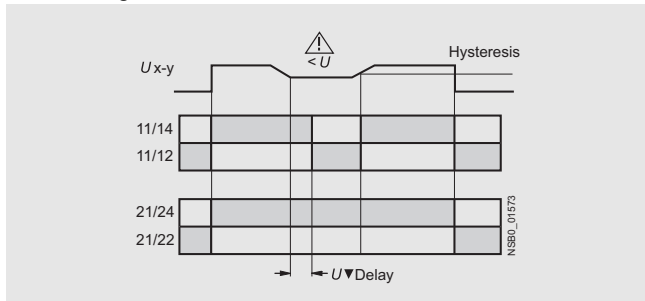
Wrong phase sequence



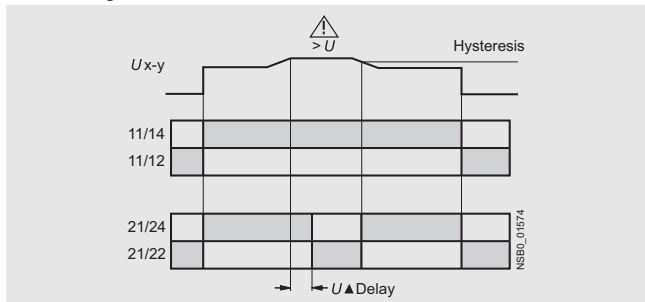
Phase failure



Undervoltage



Overvoltage



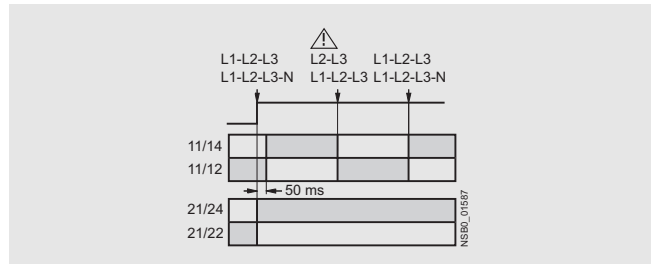
#### 3UG46 17/3UG46 18 monitoring relays

The 3UG46 17/ 3UG46 18 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 3UG46 17 line monitoring relay monitors three-phase networks with regard to phase sequence, phase failure, phase unbalance, undervoltage and overvoltage. The 3UG46 18 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 3UG46 17/ 3UG46 18 monitoring relay can be operated on the basis of either the open-circuit or closed-circuit principle and with manual or auto RESET.

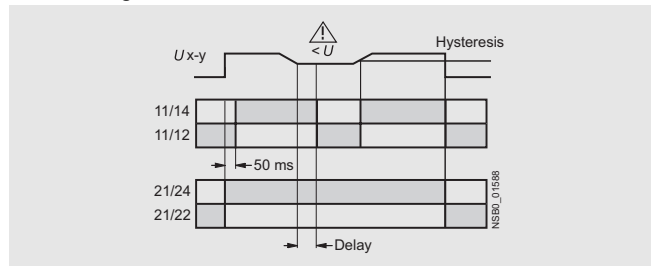
The one changeover contact is used for warning or disconnection in the event of line faults (voltage, unbalance), the other responds only to a wrong phase sequence. In conjunction with a contactor reversing assembly it is thus possible to change the direction automatically.

#### With the closed-circuit principle selected

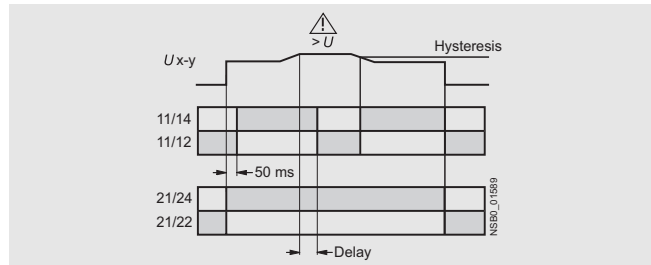
Phase failure



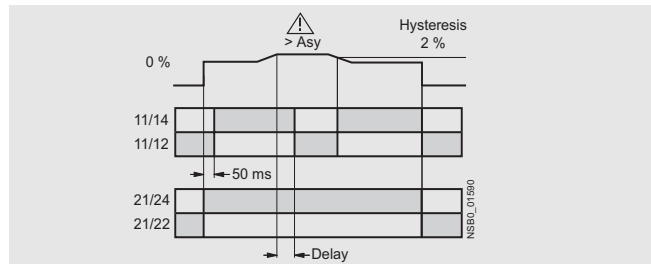
Undervoltage



Overvoltage



Unbalance



# Monitoring Relays

## 3UG Monitoring Relays for Electrical and Additional Measurements

### Line monitoring

#### Technical specifications

		3UG45 11- ..N20	3UG45 11- ..P20	3UG45 11- ..Q20	3UG45 12	3UG45 13	3UG46 14	3UG46 15 3UG46 16 3UG46 17 3UG46 18	
<b>General data</b>									
<b>Rated control supply voltage <math>U_s</math></b>	V	160 ... 260	320 ... 500	420 ... 690	160 ... 690				
<b>Rated frequency</b>	Hz	50/60							
<b>Rated power</b> , typical									
• At 230 V AC	W/VA	2/4	--	--	2/2.5				
• At 400 V AC	W/VA	--	2/8	--	2/3.5				
• At 460 V AC	W/VA	--	--	2/8	2/4				
<b>Width</b>	mm	22.5							
<b>RESET</b>		Auto-RESET				Automatic/manual			
<b>Principle of operation</b>		Closed-circuit						Closed-circuit, open-circuit (3UG46 17/3UG46 18: closed-circuit)	
<b>Availability time</b> after application of $U_s$	ms	200			1000				
<b>Response time</b> on reaching a switching threshold	ms	Max. 450							
<b>Adjustable tripping delay time</b>	s	--					0.1 ... 20		
<b>Adjustable ON-delay time</b>	s	--						0.1 ... 20	--
<b>Mains buffering time</b> , min.	ms	10			30				
<b>Rated insulation voltage <math>U_i</math></b>	V	690							
Degree of pollution 3 Overvoltage category III according to VDE 0110									
<b>Rated impulse withstand voltage</b>	kV	6							
<b>Permissible ambient temperature</b>									
• During operation	°C	-25 ... +60							
• During storage	°C	-40 ... +85							
<b>EMC tests<sup>1)</sup></b>		IEC 60947-1/ IEC 61000-6-2 / IEC 61000-6-4							
<b>Degree of protection</b>		IP40							
• Enclosures		IP20							
• Terminals									
<b>Vibration resistance</b> according to IEC 60068-2-6	Hz/mm	1-6/15; 6-500, 20 m/s <sup>2</sup>							
<b>Shock resistance</b> according to IEC 60068 Part 2-27	g/ms	15/11							
<b>Conductor cross-section</b>		M3 (standard screwdriver size 2 and Pozidriv 2)							
• <b>Screw terminals</b>		1 x (0.5 ... 4) / 2 x (0.5 ... 2.5)							
- Solid	mm <sup>2</sup>								
- Finely stranded with end sleeve	mm <sup>2</sup>	1 x (0.5 ... 2.5) / 2 x (0.5 ... 1.5)							
- AWG conductors, solid or stranded	AWG	2 x (20 ... 14)							
- Tightening torque	Nm	0.8 ... 1.2							
• <b>Spring-loaded terminals</b>		2 x (0.25 ... 1.5)							
- Solid	mm <sup>2</sup>								
- Finely stranded, with end sleeves according to DIN 46228	mm <sup>2</sup>	2 x (0.25 ... 1.5)							
- Finely stranded	mm <sup>2</sup>	2 x (0.25 ... 1.5)							
- AWG conductors, solid or stranded	AWG	2 x (24 ... 16)							
<b>Measuring circuit</b>									
<b>Measuring range</b> AC 50/60 Hz rms value	V	160 ... 260	320 ... 500	420 ... 690	160 ... 690				
<b>Setting range</b>	V					200...690	160...690		
<b>Measuring accuracy</b>	%	--				±5			
<b>Repeat accuracy</b> at constant parameters	%	--				±1			
<b>Setting accuracy</b>		--				±10 % referred to set value		±1 V	
<b>Accuracy of digital display</b>		--				+/-1 digit			
<b>Deviations</b> for temperature fluctuations	%/°C	--				±0.1			
<b>Hysteresis</b> for voltage	V	--				5 % of set value		1 ... 20 V	
<b>Hysteresis</b> for unbalance	%	--						2 % of limit value	2 % of limit value for 3UG46 17/ 3UG46 18
<b>Deviation for frequency fluctuation</b>	%	--				±1 %			

<sup>1)</sup> Note: This is a Class A product. In the household environment this device may cause radio interference. In this case the user must introduce suitable measures.