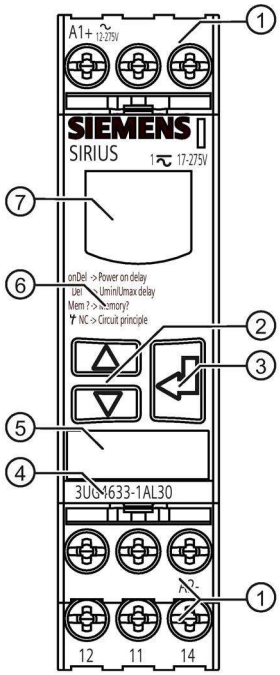
10.3 3UG4633 voltage monitoring relay

10.3.1 Operator controls and connection terminals

Front view / terminal assignment 3UG4633

Front view	Description	
	**Position digits**	
	①	Terminal block (removable): Connection is possible using screw terminals or spring-loaded terminals.
	②	Arrow keys for menu navigation
	③	SET key for menu navigation
	④	Device article number
	⑤	Label
	⑥	Legend for menu
	⑦	Display for parameterization, actual-value indication, and diagnostics
	Terminal labels	
	A1+	Rated control supply voltage ~ / +
	A2-	Rated control supply voltage ~ / -
	12	Output relay K1 CO contact NC contact
	11	Output relay K1 CO contact root
	14	Output relay K1 CO contact NO contact

You can find additional information on the connection terminals and the permissible conductor cross-sections in the Chapter "Connection methods (Page 21)".

You can find information on connecting in the Chapter "Circuit diagrams (Page 281)".

10.3.2 Functions

General functionality

Depending on the setting, the 3UG4633 voltage monitoring relays are **self-powered** (measuring voltage = rated control supply voltage) and monitor an AC voltage or DC voltage at terminals A1 and A2 of the device for **overshoot** (U▲) or **undershoot** (U▼) or in **range monitoring** (U▲ and U▼).

The voltage monitoring relays are powered with a rated control supply voltage of 17 to 275 V AC/DC through terminals A1/A2.

The 3UG4633 voltage monitoring relays have a display and are parameterized with three keys.

You will find the setting ranges and factory settings of the available parameters in Chapter "Operation (Page 278)."

You will find a description of the individual parameters in Chapter "Parameters (Page 363)."

Monitoring

Output relay K1 responds in accordance with the set relay switching behavior (closed-circuit principle NC or open-circuit principle NO).

An output change-over contact is available as a signaling contact.

If the voltage is switched on, the display will show the current measured value and a symbol for monitoring for voltage overshoot, voltage undershoot, or range monitoring.

Startup delay

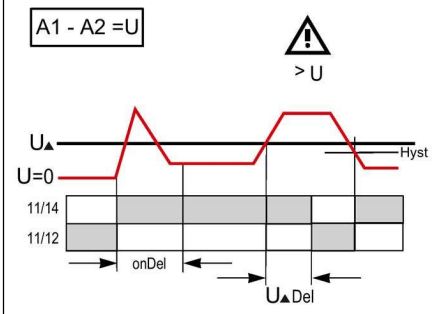
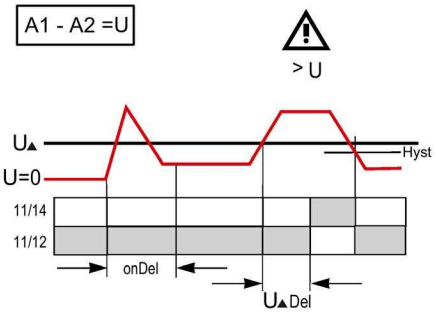
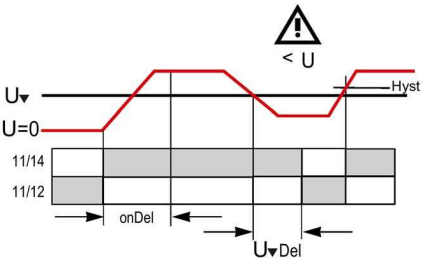
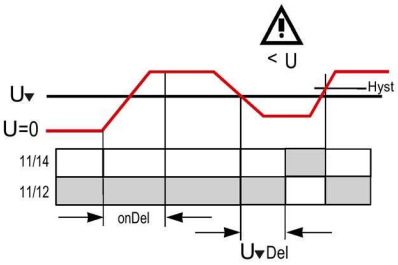
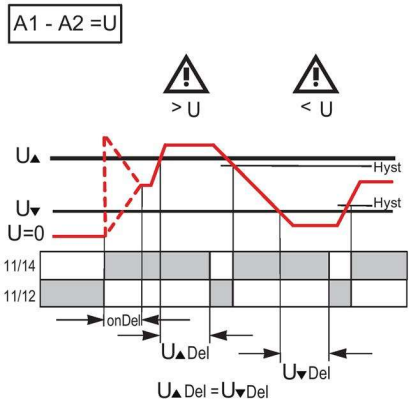
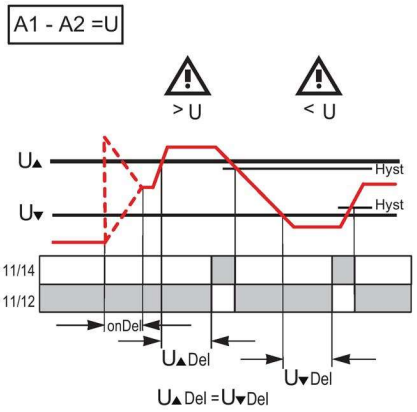
To be able to start a drive, the output relay switches to the correct state during the ON-delay time (onDel) depending on the selected open-circuit principle or closed-circuit principle, even if the measured value is still under the set value.

Tripping delay

If the measured value overshoots or undershoots the set threshold after expiry of the ON-delay time (onDel), the set tripping delay time (Del) and the relay symbol will flash. After expiry of this time, the output relays change the switching state. On the display, the current measuring value and the symbol for undershoot or overshoot flash.

You will find the switching states of the output relay below in the section entitled "Function diagrams" and in Chapter "Diagnostics (Page 279)."

Function diagrams 3UG4633

Display	Memory = no Relay switching behavior = NC (closed-circuit principle)	Memory = no Relay switching behavior = NO (open-circuit principle)
U▲ U▼ = off		
U▲ = off U▼		
U▲ U▼		

10.4 Operation

Parameters

Parameterization of the devices is possible locally using the display and the three keys.

Parameter information

The table below shows the settable parameter information of the 3UG463. voltage monitoring relays:

Table 10- 2 Parmeter information, 3UG463. voltage monitoring relays with digital setting

Menu level	Parameters	Setting range		Increment	Factory setting
		Minimum value	Maximum value		
"RUN"	Threshold for undershoot (U▼)	0.1 V or OFF[1)] 10 V or OFF[2)] 17 V or OFF[3)]	60 V[1)] 600 V[2)] 275 V[3)]	0.1 V	20 V[1)] 170 V[2), 3)]
"RUN"	Threshold for overshoot (U▲)	0.1 V or OFF[1)] 10 V or OFF[2)] 17 V or OFF[3)]	60 V[1)] 600 V[2)] 275 V[3)]	0.1 V	30 V[1)] 260 V[2),3)]
"SET"	Hysteresis (Hyst)	0.1 V	30 V[1)] 300 V[2)] 150 V[3)]	0.1 V	2 V[1)] 5 V[2), 3)]
"SET"	ON-delay time (onDel)	0.1 s[3)]	20 s[3)]	0.1 s[3)]	0.1 s[3)]
"SET"	Tripping delay time (U▼Del)	0.1 s	20 s	0.1 s	0.1 s
"SET"	Reset response (Mem)	no = Autoreset	yes = Hand-RESET	--	no = Autoreset
"SET"	Relay switching behavior (closed-circuit principle NC / open-circuit principle NO)	NC	NO	--	NC

1) 3UG4631 voltage monitoring relay

2) 3UG4632 voltage monitoring relay

3) 3UG4633 voltage monitoring relay

Note

The monitoring mode "Overshoot" or "Undershoot" is defined with the setting OFF at the threshold for undershoot or overshoot.

Note

Deactivating monitoring

If the upper and lower threshold values are deactivated (OFF), monitoring will cease for:

- Voltage overshoot
- Voltage undershoot

The up-to-date measured value is displayed permanently.

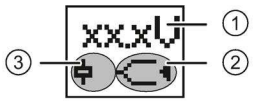
The parameters are described in Chapter "Parameters (Page 363)."
Menu-based operation is described in Chapter "Menu-based operation (Page 39)."

10.5 Diagnostics

10.5.1 Indications on the display

Display information

The display is divided into three different areas.



① Voltage measured value or fault symbol
② Type of monitoring
③ Symbol of the changeover contact

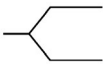
Meaning of the information on the display

Note

Indications in the event of a fault

The symbols on the display flash to indicate an error.

The following statuses and faults are indicated on the display as a diagnostics message with flashing symbols:

Display area	Symbol	Meaning
①	20.0V	Measured voltage is displayed
②		Monitoring for voltage overshoot
②		Monitoring for voltage undershoot
②		Range monitoring (monitoring for voltage overshoot and undershoot)
②	◄	Voltage is in correct range
②	▲	A voltage overshoot has occurred
②	▼	A voltage undershoot has occurred
③		• Not flashing: Relay contact 11/12 open, relay contact 11/14 closed • Flashing: Delay time (ON-delay or tripping delay) running • Masked out: Relay contact 11/12 closed, relay contact 11/14 open

You will find more information about the switching behavior of the output relay in Chapter "Functions (Page 273)" (3UG4631 / 3UG4632) and "Functions (Page 276)" (3UG4633).

10.5.2 Reset

RESET

How the outputs are reset depends on the "Reset response" parameter (see Chapter "Reset response (Page 363)").

The following settings can be selected:

- Automatic reset (Memory = O / Mem = no)

  The device is reset automatically as soon as a previously occurring error has been dealt with.

- Manual RESET (Memory = I / Mem = yes)

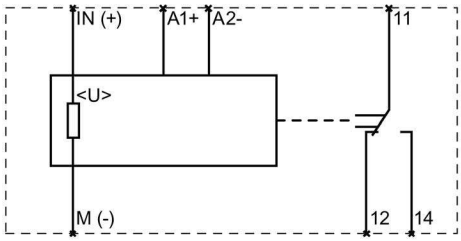
  To reset the devices with digital setting, it is necessary to press both arrow keys simultaneously for more than 2.5 s after removal of the cause of error. If the cause of the error has not been removed, a new error message appears immediately. Alternatively, the devices can be reset by switching the rated control supply voltage on and off.

10.6 Circuit diagrams

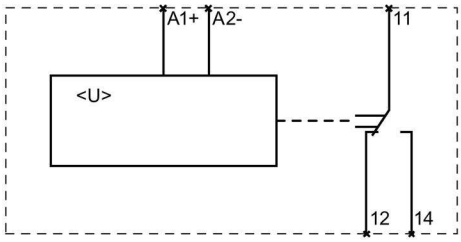
10.6.1 Internal circuit diagrams

Internal circuit diagrams 3UG4631 / 3UG4632 and 3UG4633

3UG4631 / 3UG4632 voltage monitoring relays



3UG4633 voltage monitoring relay



Note

On the 24 V AC/DC versions of the 3UG4631-.AA30 and 3UG4632-.AA30, terminals A2 and M (GND) are electrically connected in the device!
On the 24 to 240 V AC/DC versions of the 3UG4631-.AW30 and 3UG4632-.AW30, terminals A2 and M (GND) are electrically separated!

10.6.2 Wiring examples

3UG4631-.AA30 / 3UG4632-.AA30

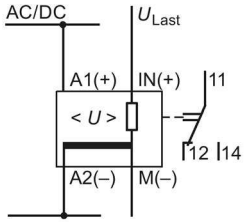


Image 10-1 3UG4631-.AA30 / 3UG4632-.AA30

3UG4631-.AW30 / 3UG4632-.AW30

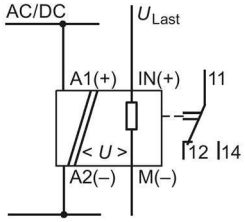


Image 10-2 3UG4631-.AW30 / 3UG4632-.AW30

3UG4633

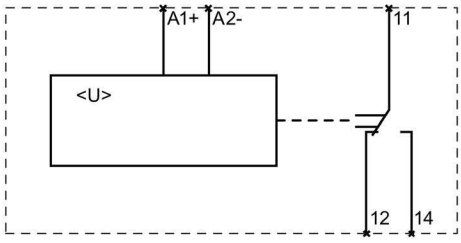


Image 10-3 3UG4633

10.7 Technical data

Measuring circuit

		3UG4631-1	3UG4632-1	3UG4633-1	3UG4631-2	3UG4632-2	3UG4633-2
Type of voltage for monitoring		AC/DC					
Number of poles for main current circuit		1					
Measurable line frequency	Hz	500 … 40					40 … 500
Measurable voltage							
• for AC	V	0.1 … 60	10 … 600	17 … 275	0.1 … 60	10 … 600	17 … 275
• for DC	V	0.1 … 60	10 … 600	17 … 275	0.1 … 60	10 … 600	17 … 275
Adjustable voltage range	V	0.1 … 60	10 … 600	17 … 275	0.1 … 60	10 … 600	17 … 275
Adjustable response delay time							
• when starting	s	—	—	0.1 … 20	—		0.1 … 20
• with lower or upper limit violation	s	0.1 … 20					

General technical details

	3UG463.-1.A	3UG463.-1.L	3UG463.-1.W	3UG463.-2.A	3UG463.-2.L	3UG463.-2.W
Product function	Voltage monitoring relay					
Design of the display	LCD					
Product function						
• tension window recognition of 1 phase	Yes					
• tension window recognition of 3 phases	No					
• tension window recognition DC	Yes					
• overvoltage recognition of 1 phase	Yes					
• overvoltage recognition of 3 phases	No					
• overvoltage recognition DC	Yes					
• undervoltage recognition of 1 phase	Yes					
• undervoltage recognition of 3 phases	No					
• undervoltage recognition DC	Yes					
• reset external	Yes					
• self-reset	Yes					
• open-circuit or closed-circuit current principle	Yes					

		3UG463.-1.A	3UG463.-1.L	3UG463.-1.W	3UG463.-2.A	3UG463.-2.L	3UG463.-2.W
Starting time after the control supply voltage has been applied	s	1					
Response time maximum	ms	450					
Relative metering precision	%	5					
Precision of digital display		+/-1 digit					
Relative temperature-related measurement deviation	%	0.1					
Relative repeat accuracy	%	1					
Type of voltage of the controlled supply voltage		AC/DC					
Control supply voltage							
• at 50 Hz at AC							
– rated value	V	24	17 … 275	24 … 240	24	17 … 275	24 … 240
• at 60 Hz at AC							
– rated value	V	24	17 … 275	24 … 240	24	17 … 275	24 … 240
• for DC							
– rated value	V	24	17 … 275	24 … 240	24	17 … 275	24 … 240
Working range factor supply voltage rated value							
• at 50 Hz for AC		0.85 … 1.15	1	0.85 … 1.1	0.85 … 1.15	1	0.85 … 1.1
• at 60 Hz for AC		0.85 … 1.15	1	0.85 … 1.1	0.85 … 1.15	1	0.85 … 1.1
• for DC		0.85 … 1.15	1	0.85 … 1.1	0.85 … 1.15	1	0.85 … 1.1

		3UG463.-1.A	3UG463.-1.L	3UG463.-1.W	3UG463.-2.A	3UG463.-2.L	3UG463.-2.W
Impulse voltage resistance rated value	kV	4					
Recorded real power	W	2					
Protection class IP		IP20					
Electromagnetic compatibility		IEC 60947-1 / IEC 61000-6-2 / IEC 61000-6-4					
Operating current at 17 V minimum	mA	5					
Continuous current of the DIAZED fuse link of the output relay	A	4					
Resistance against vibration according to IEC 60068-2-6		1 … 6 Hz: 15 mm, 6 … 500 Hz: 2g					
Resistance against shock according to IEC 60068-2-27		sinusoidal half-wave 15g / 11 ms					
Installation altitude at a height over sea level maximum	m	2 000					
Maximum permissible voltage for safe disconnection							
• between control and auxiliary circuit	V	300					
• between auxiliary circuit and auxiliary circuit	V	300					
Conductor-bound parasitic coupling BURST according to IEC 61000-4-4		2 kV					
Conductor-bound parasitic coupling conductor-earth SURGE according to IEC 61000-4-5		2 kV					
Conductor-bound parasitic coupling conductor-conductor SURGE according to IEC 61000-4-5		1 kV					
Electrostatic discharge according to IEC 61000-4-2		6 kV contact discharge / 8 kV air discharge					

		3UG463.-1.A	3UG463.-1.L	3UG463.-1.W	3UG463.-2.A	3UG463.-2.L	3UG463.-2.W
Field-bound parasitic coupling according to IEC 61000-4-3		10 V/m					
Insulation voltage for overvoltage category III according to IEC 60664 with degree of pollution 3 rated value	V	690					
Ambient temperature							
• during operating	°C	-25 … +60					
• during storage	°C	-40 … +85				85 … -40	-40 … +85
• during transport	°C	-40 … +85				85 … -40	-40 … +85
Design of the electrical isolation		Safe isolation					
Galvanic isolation							
• between entrance and outlet		Yes					
• between the outputs		Yes					
• between the voltage supply and other circuits		No		Yes	No		Yes
Mechanical operating cycles as operating time typical		10 000 000					
Electrical operating cycles as operating time at AC-15 at 230 V typical		100 000					
Operating cycles with 3RT2 contactor maximum	1/h	5 000					

Mechanical design

		3UG463.-1....	3UG463.-2....
Width	mm	22.5	
Height	mm	92	94
Depth	mm	91	
Built in orientation		any	
Distance, to be maintained, to earthed part			
• forwards	mm	0	
• backwards	mm	0	
• sidewards	mm	0	
• upwards	mm	0	
• downwards	mm	0	
Distance, to be maintained, to the ranks assembly			
• forwards	mm	0	
• backwards	mm	0	
• sidewards	mm	0	
• upwards	mm	0	
• downwards	mm	0	
Distance, to be maintained, conductive elements			
• forwards	mm	0	
• backwards	mm	0	
• sidewards	mm	0	
• upwards	mm	0	
Type of mounting		snap-on mounting	
Product function removable terminal for auxiliary and control circuit		Yes	
Design of the electrical connection		screw-type terminals	spring-loaded terminals
Type of the connectable conductor cross-section			
• solid		1x (0.5 ... 4 mm2), 2x (0.5 ... 2.5 mm2)	2x (0.25 ... 1.5 mm2)
• finely stranded			
– with wire end processing		1x (0.5 ... 2.5 mm2), 2x (0.5 ... 1.5 mm2)	2 x (0.25 ... 1.5 mm2)
– without wire end processing		—	2x (0.25 ... 1.5 mm2)
• for AWG conductors			
– solid		2x (20 ... 14)	2x (24 ... 16)
– stranded		2x (20 ... 14)	2x (24 ... 16)
Tightening torque			
• with screw-type terminals	N·m	1.2 … 0.8	— …
Number of change-over switches delayed switching		1	