

ke – ADG

OVER and UNDER VOLTAGE CONTROL RELAY

- ▶ Over & Under Voltage % Adjustment
- ▶ Phase Failure
- ▶ Phase Sequence
- ▶ Delay Time Adjustment



PRODUCTION CODE	VOLTAGE ADJUSTMENT INTERVAL (%)		TIME DELAY INTERVAL		SUDDEN OPENING <math><0,65 \times U_n></math> >$>1,35 \times U_n>$	PHASE SEQUENCE CONTROL	TRI PHASE	MONO PHASE	USAGE FIELDS	DIMENSIONS
	Under Voltage % (<math><U_n></math>)	Over Voltage % (>$>U_n>$)	Time Delay	Function						
ke-ADG31	(0,70-0,95) $\times U_n$	(1,05-1,30) $\times U_n$	1-10 s.	Off Delay	•		•		Command, control or compensation systems, electrical motors, condensers	28 x 82 x 80 mm
ke-ADG33	(0,70-0,95) $\times U_n$	(1,05-1,30) $\times U_n$	1-10 s.	Off Delay	•	•	•			
ke-ADG37	(0,70-0,95) $\times U_n$	(1,05-1,30) $\times U_n$	1-10 min.	On Delay	•	•	•	•	Air conditioners and compressors	
ke-ADG11	(0,70-0,95) $\times U_n$	(1,05-1,30) $\times U_n$	1-10 s.	Off Delay	•				Command, control systems	
ke-ADG15	(0,70-0,95) $\times U_n$	(1,05-1,30) $\times U_n$	1-10 min.	On Delay	•				Air conditioners	



Under Voltage Adjust.
Under Voltage Led
Normal Led

Over Voltage Led
Over Voltage Adjust.
(t) Delay Time

General:

Microprocessor controlled. Three or single phase relay is used in systems exposed to over or under voltage, such as command, control or compensation systems and protects devices such as condensers, motors, air conditioners and compressors. It is divided into sub-categories depending on the voltage adjustment range, phase sequencing control, on or off start modes.

▶ **Sudden Switch Off** : When any phase voltage's difference respect to nominal voltage exceeds 35%, without any time delay Normal LED is turned off and relay contact is de-energized.

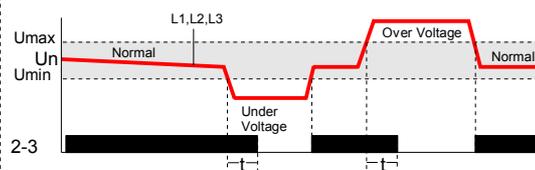
▶ **Voltage Adjustment Range** :
 $U_{min} = (0.70 - 0.95) \times U_n$;
 $U_{max} = (1.05 - 1.30) \times U_n$
 When the adjusted limits are not exceeded, Normal (Un) LED is on and the relay contact is energized.

▶ **Phase Sequencing Control** : For the models with phase sequencing control, when device is energized, if the phase sequence is wrong, over (>Un) and under (<Un) LEDs are turned on together and phase sequence error is indicated. Meanwhile, Normal LED (Un) is turned off and relay contact is open circuit. In case of phase sequence is correct and phase voltages are in adjusted percentage range, the delay time for turning the Normal LED on and energizing the relay depends on the Off Delay or On Delay type of device. For further information please refer to graph 1 & 2 and Delay Time Modes section of this manual.

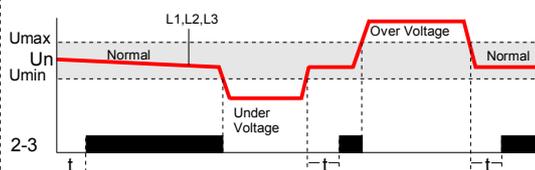
▶ **Delay Time Modes** : There are two types, one is Off-Delay and the other is On-Delay.

Off Delay : (refer graph 1)

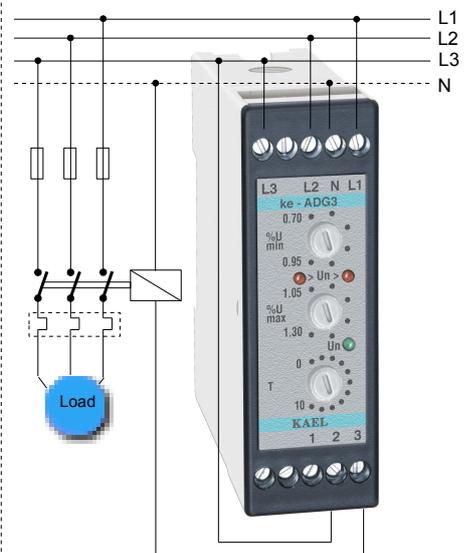
If phase voltages are in the adjusted percentage range, normal LED turns on and relay contact is energized. When adjusted over or under voltage limit is exceeded 1-10 sec delay time is started. During this time interval, appropriate error LED is also on together with Normal LED and at the end of delay time, Normal LED is turned on and relay contact is de-energized. When the error condition is disappeared, Normal LED is turned on and relay contact is re-energized.



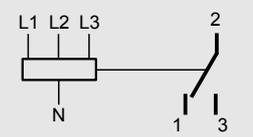
▶ **On Delay** : If phase voltages are in the adjusted percentage range, adjusted delay time, 1-10 min, is counted and at the end of delay time Normal LED is turned on and relay contact is energized. When adjusted over or under voltage limit is exceeded, Normal LED is turned on and relay contact is de-energized immediately, without waiting any delay time. When the phase voltages return into adjusted normal range (also considering the difference), adjusted 1-10 min delay time is counted and at the end of this time, Normal LED is turned on and relay contact is re-energized.



Simple Connection :



L1,L2,L3 : 3 x 400 V ac
 L1,N : 230 V ac



TECHNICAL DATA:

- Rated Voltage, Un : 3 phase and 1 neutral 230 VAC
- Operating Range : (0,5-1,5) x Un (Un nominal voltage)
- Frequency : 50/60 Hz
- Over and Under Voltage Adjustment Range : Please refer to table
- Delay Time Adj. : Please refer to table
- Sudden Switch Off : Below Un x 0.65 and above Un x 1.35
- Sudden Switch Off Time : 500 msec
- Output Contacts : Normally Close Contact (2-1) Normally Open Contact (2-3)
- Contact Current : max. 5A/240 VAC
- Power Consumption : < 8 VA
- Device Protection Class: IP20
- Connector Protection Class : IP00
- Ambient Temperature : -5 °C.....+50 °C
- Connection Type : To connection rail in electrical panel
- Dimensions : 28x82x80 mm

