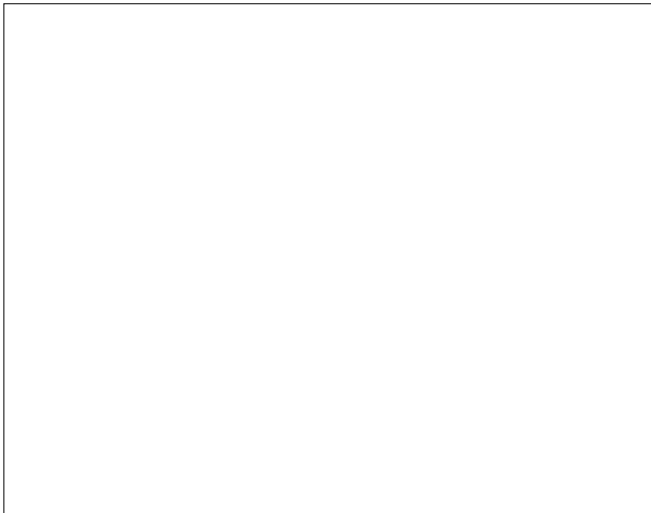


# Asymmetry relays

## ASR394 ASR394Z

for three-phase alternating mains to 660 V



Two floating changeover contacts are available for output signals. The output relay is excited during normal operating (NC-operation). It drops out if a voltage asymmetry departs from the predetermined nominal value range. The built-in green indicating LED extinguishes in the case of a fault.

The asymmetry relays can be supplied with (ASR394Z) or without (ASR394) delay function, as required.

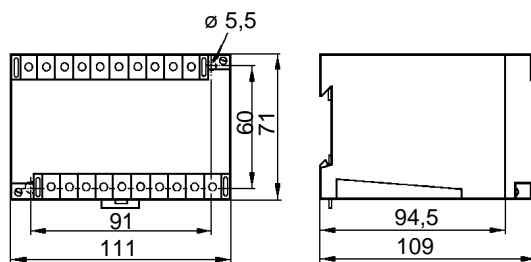
### Mode of operation

The actual values of the outer conductor voltages are obtained, without direct connection to the mains, via measurement transformers. The values to be measured have interference removed, and are fed to an electronic evaluation circuit. This compares the actual values with each other, and evaluates the difference to obtain the asymmetry.

The nominal range for asymmetry is adjustable. If the preselected nominal value limit is exceeded by a voltage asymmetry, then the output relay loses its excitation (possibly after a predetermined time delay). The contacts, 2 change-overs, return to their resting positions and the built-in LED extinguishes.

The resetting of the output relay to its normal working position takes place automatically and without delay, when the difference of the outer conductor voltages has reached the predetermined nominal value range again. The permanently set switching hysteresis should be taken into consideration (about 2 % of the response value).

**Dimensions diagram** (sizes in mm)



### Design description

The units are fitted in a plastic case suitable for quick assembly on a carrier rail 35x27x7,3 mm, DIN EN 50 022, or for screwed panel assembly.

### Product description

The asymmetry relays ASR394 and ASR394Z monitor three-phase alternating mains, and signal asymmetry of voltage in the mains. They do not require a connection to neutral, and are therefore universally suitable for three- and four-conductor mains.

The auxiliary voltage for the supply of the electronics is taken from the mains to be monitored.

The response values for asymmetry and for delay time (only ASR394Z) are continuously adjustable. The auxiliary and measuring voltages are not in direct connection with the mains. Special input transformers suppress the transfer of interference from the mains. If used for mains contaminated with voltage peaks (thyristor control and similar sources), then it is possible to install an additional protective circuit.

### Note

The delay time remains fully effective even if one phase fails. In the case of complete mains failure, the delay becomes ineffective down to the characteristic time of the instrument. If the delay function must be maintained even for total mains failure, then this is possible by a combination of ASR394Z and an energy store of type SP100.

Check for correct nominal system voltage!

Every unit has terminal covers included. If you do not use them, other suitable measures must be used for the prevention of an accident acc. VBG 4.

## Technical Data ASR394, ASR394Z

Nominal insulation voltage	660 V
Insulation group according to VDE 0110	C
Contacts	AC 250 V
Measuring range	AC 660 V
Test voltage	3000 V
Operation class	permanent operation

Rated mains voltage $U_N$	3 AC 50 ... 60 Hz 660, 500, 380, 220 or 100 V other values on request
Operating range	0,5 ... 1,3 $U_N$
Max. self-consumption	5 VA

Response value steplessly adjustable	5 % ... 15 %
Response retardation	
ASR394	none
ASR394Z steplessly adjustable	0,5 ... 5 sec
Switch hysteresis	2 % from threshold

Switch components	two change-over contacts
Switch capacity max.	1100 VA
Nominal contact voltage	220 V
Permanent current	5 A
Break capacity	
at AC 220 V and $\cos. \phi = 0,4$	3 A
at DC 110 V and $R/L = 0$	0,3 A
Operating principle	NC operation

Admissible ambient temperature	
when operating	-10°C ... +50°C 263 K ... 323 K
when store	-20°C ... +70°C 253 K ... 343 K

Mounting	indifferent
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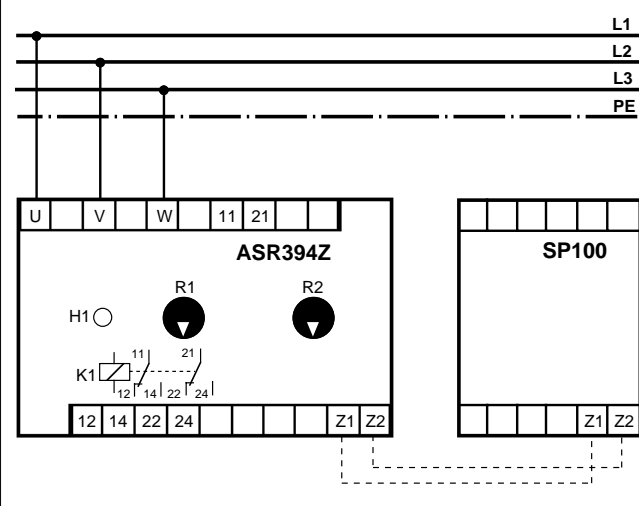
Type of connection	terminal screws with self-lifting clamp-washers
Terminal screws	M 3,5
Wire cross section	
single wire	2 x (1 ... 1,5 mm <sup>2</sup> )
fine braid with end sleeve	2 x (0,75 ... 1,5 mm <sup>2</sup> )

Protection class according to DIN 40 050	
Internal components	IP 50
Terminals	IP 10
with terminals covers	IP 20

Wiring diagram	NA 36
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Weight approx.	700 g
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## Wiring diagram



## Legent to wiring diagram

- H1 Built-in LED, glows for normal operation and extinguishes for asymmetry and mains failure.
- R1 Adjustable time delay (only ASR394Z).
- R2 Adjustable response value for asymmetry.
- K1 Output relay with two change-over contacts in NC operation.
- SP100 Energy store for max. 5 sec.  
Additional equipment to maintain the delay function in the case of total mains failure.

## Ordering details

Type	Rated mains voltage $U_N$	Art.-No.
ASR394	3 AC 660 V	935 000
	3 AC 500 V	935 050
	3 AC 380 V	935 100
	3 AC 220 V	935 150
	3 AC 100 V	935 600
ASR394Z	3 AC 660 V	935 001
	3 AC 500 V	935 051
	3 AC 380 V	935 101
	3 AC 220 V	935 151
	3 AC 100 V	935 601
SP100		935 700

Other values on request.

Right to modifications reserved