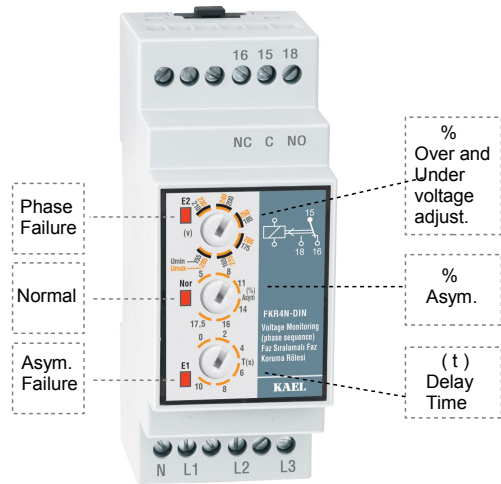


# FKR4N-DIN

## PHASE FAILURE and PHASE SEQUENCE DEVICE

- ▶ Asymmetry % Adjustment (Phase-phase : % 5 – 17,5)
- ▶ Over&Under Voltage % Adjustment (% 5 – 30)
- ▶ Delay Time Adjustment ( 1 – 10 sec. )

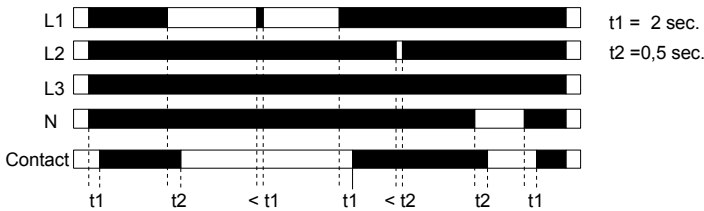


### General:

In three phase systems, when phase sequence is correct and there is no asymmetry between phases, **normal** LED is turned on and relay contact is energised. Protection functions of FKR4N-DIN are given below.

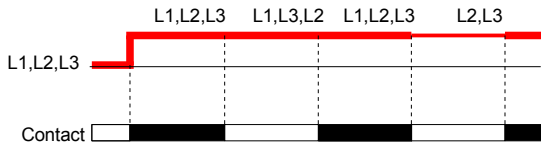
### Phase Failure:

In case of absence of at least one phase, relay immediately de-energises its contact and **E2** LED is turned on.



### Phase Sequence:

In case of wrong phase order, both of **E1** and **E2** LEDs are turned on at the same time and relay does not energise its contact. If phase order is corrected, both of **E1** and **E2** LEDs are turned off and relay energises its contact.



### Voltage Asymmetry (asym. %): ( 5 -17,5 %)

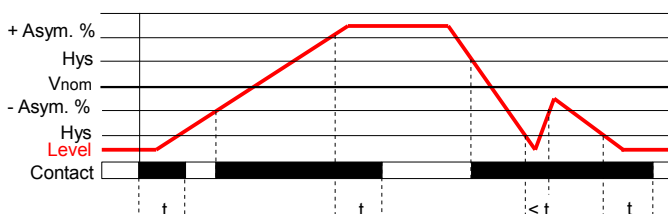
Phase to phase asymmetry is adjusted using the adjustment knob in the range of (5-17.5%). If asymmetry exceeds adjusted value, LED **E1** starts to flash and at the end of delay time (1-10s) **E1** LED is turned on continuously and relay contact is de-energised. To return normal state, voltage asymmetry value must be under 20% of adjusted value (hysteresis). If phase – phase asymmetry value returns to normal region in a shorter time then adjusted delay time, relay does not deenergise its contact and LED **E1** stops flashing.

Example: Let's say that asymmetry value is set to 15% for a 3 x 380VAC. In this case, relay contact is deenergised at  $(380 - (380 \times 0.15)) = 323$  V.

Re-energising the contact is performed at  $323 + (380 \times 15\% \times 20\%) = 334$  V. (20% is the hysteresis).

$$\text{Asym. \%} = \frac{(V_{\max} - V_{\min})}{380} \times 100$$

$$\text{Hys} = 380 \times (\text{Asym. \%}) \times (20 \%)$$

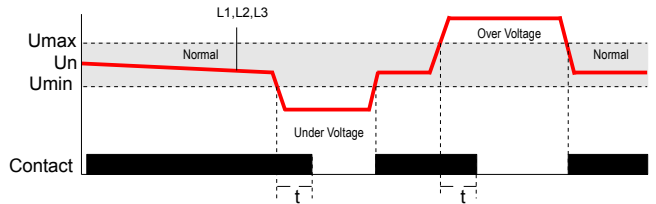


### Voltage Adjustment Range: $\pm (0,5 - 0,30)\%$

Under Voltage  $U_{\min} = (0.70 - 0.95) \times U_n$  and

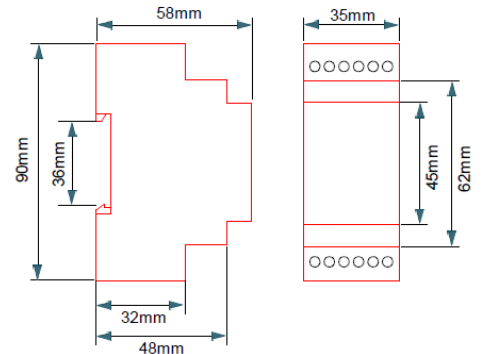
Over Voltage  $U_{\max} = (1.05 - 1.30) \times U_n$ .

As long as the voltage values do not exceed adjusted values, **normal** LED is kept on and relay contact is energized. Hysteresis is 15%. LED **E2** indicates that the adjusted voltage range is exceeded. There is only one adjustment knob for both over and under voltage values.



### TECHNICAL DATA:

- Rated Voltage : 3 Phase and 1 Neutral (VL-N; 220 Vac and VL-L; 380Vac)
- Operating Range :  $(0,8 - 1,2) \times U_n$  (Un nominal voltage)
- Frequency : 50/60 Hz.
- Delay Time : 1 – 10 sec.
- Contact current : Max.5 A / 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 : 35x90x58 mm



### Connection Scheme

