



## DESCRIPTION

Unbalanced supply voltages cause often overheating, even damage in electric motors due to high circulating currents caused by asymmetrical voltages.

DPR-06 relay is a three-phase (line to line) voltage asymmetry protection relay designed for electric motor protection.

It offers adjustable asymmetry limit together with adjustable trip and reset delays. The unit has also phase sequence protection, phase failure and phase overvoltage protections.

The asymmetry limit can be adjusted or disabled via trimmers on the front panel of the device.

Delay timers are adjusted through related trimmers.

## FEATURES

***DIN Rail mounted***

***Adjustable asymmetry limit***

***Adjustable TRIP and RESET Delays***

***Phase sequence protection***

***Phase failure protection***

***Insufficient supply protection***

***Overvoltage protection***

***6A/277VAC relay output***

# DPR-06

## VOLTAGE ASYMMETRY PROTECTION RELAY (LINE TO LINE)

### OPERATION

#### ASYMMETRY PROTECTION

The maximum allowed asymmetry limit is adjusted between 5 to 15% with the ASYM trimmer. If the voltage unbalance (asymmetry) goes over the set asymmetry limit, the "ASM" led turns on and the adjusted Delay timer starts to count. If the fault condition disappears before the Delay timer expires, then the "ASM" led turns off. If the fault condition persists until the expiration of the Delay timer, the relay output is deactivated and the "OUT" led turns off.

The asymmetry is defined with below formula:

$$\text{Asymmetry \%} = [(V_{\text{maxLL}} - V_{\text{minLL}}) / 400V] \times 100$$

When the measured unbalance is again below the adjusted limit, the "ASM" led turns off and the adjusted Reset Delay timer starts to count. When the timer is expired, the relay output is activated and the "OUT" led turns on.

#### PHASE FAILURE PROTECTION

If the voltage of any phase falls below 65% of the nominal value, then "ASM" led turns on and immediately the relay output is deactivated and the "OUT" led turns off.

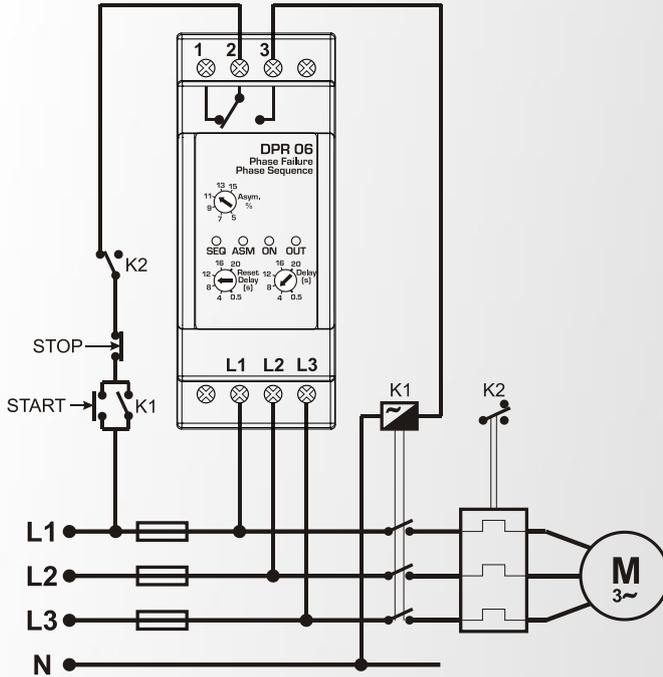
#### OVERVOLTAGE PROTECTION

If the voltage of any phase goes 50% above the nominal value, then "ASM" led turns on and immediately the relay output is deactivated and the "OUT" led turns off.

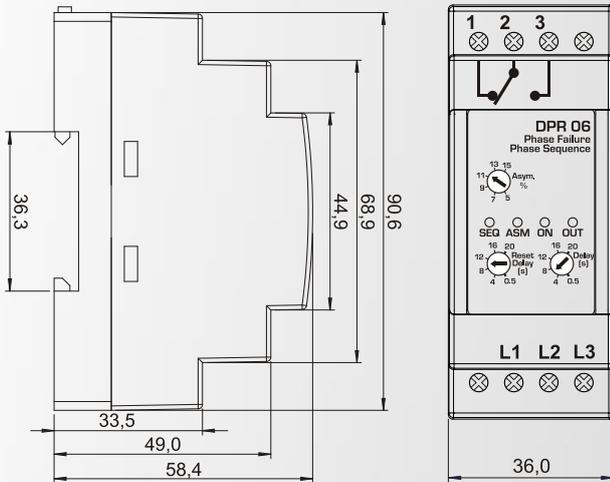
#### PHASE SEQUENCE PROTECTION

If the phase sequence is reversed, the "SEQ" led starts to flash, the relay output is deactivated and the "OUT" led turns off.

## CONNECTION DIAGRAM



## DIMENSIONS



## INPUTS

L1-L2-L3 : Phase voltages inputs

## OUTPUTS

- 1 : Relay output (NC)
- 2 : Relay output (COM)
- 3 : Relay output (NO)

## LED INDICATORS

- ON: Supply LED (green)
- OUT: Relay output LED (yellow)
- SEQ: Phase sequence failure led (red)
- ASM: Voltage unbalance warning LED (red)

SEQ	ASM	ON	OUT	DESCRIPTION
		ON	ON	Voltages OK
ON		ON		Phase sequence trip
	ON	ON	ON	Unbalance warning
		ON	ON	Unbalance trip Phase failure Overvoltage

## TECHNICAL SPECIFICATIONS

- Nominal Supply Voltage: 400V-AC (L-L)
- Supply Voltage Range: 260-520 V-AC (L-L)
- Supply type: Capacitive, 3 phase
- Frequency Range: 47-63Hz
- Power Consumption: 30VA / 2W (max)
- Measurement method: True RMS, line to line
- Asymmetry Adjustment Accuracy: 1 %
- Repetition Accuracy: 0.5 %
- Asymmetry Adjustment Range: 5 – 15%
- Trip Delay Setup: 0.5 – 20 sec. adjustable
- Reset Delay Setup: 0.5 – 20 sec. adjustable
- Relay Output: 6A @ 277V-AC, 1800VA, 300W
- Terminal wire range: max 2.5mm<sup>2</sup> (12AWG)
- Screw-on Force: 0.4 Nm (3.6 lb.in)
- Operating temp.: -30°C (-22°F) to 70 °C (158°F).
- Storage temp.: -40°C (-40°F) to 80 °C (176°F).
- Maximum humidity: 95% non-condensing.
- Dimensions: 36,0x90,6x58,4mm (WxHxD)
- Weight: 100 gr(approx.)
- Installation: DIN Rail mounted.
- Case Material: High Temp. ABS/PC (UL94-V0)
- IP Protection: IP30
- Conformity (EU directives)
  - 2006/95/EC (low voltage)
  - 2004/108/EC (EMC)
- Norms of reference:
  - EN 61010 (safety requirements)
  - EN 60255-6
  - EN 61326 (EMC requirements)

