

## DPR-06 VOLTAGE ASYMMETRY PROTECTION RELAY (LINE TO LINE)

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.

### 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.



#### SAFETY NOTICE

Failure to follow below instructions will result in death or serious injury

\* Electrical equipment should be installed only by qualified specialist. No responsibility is assured by the manufacturer or any of its subsidiaries for any consequences resulting from the non-compliance to these instructions.

\* Check the unit for cracks and damages due to transportation. Do not install damaged equipment.

\* Do not open the unit. There is no serviceable parts inside.

\* Fuses of fast type (FF) with a maximum rating of 6A must be connected to phase voltage inputs, in close proximity of the unit.

\* Disconnect all power before working on equipment.

\* When the unit is connected to the network do not touch terminals.

\* Any electrical parameter applied to the device must be in the range specified in the user manual.

\* Do not try to clean the device with solvent or the like. Only clean with a damp cloth.

\* Do not allow water to come inside the unit.

\* Verify correct terminal connections before applying power.

\* Only for DIN rail mounting.

### PRE-INSTALLATION

#### Before installation:

- Read this manual carefully, determine the correct connection diagram.

- Make sure to use adequate fuses.

- Do not subject the unit to water spill.

#### Below conditions may damage the device:

- Incorrect connections.

- Incorrect power supply voltage.

- Overload or short circuit at relay outputs

- Power supply frequency out of specified limits

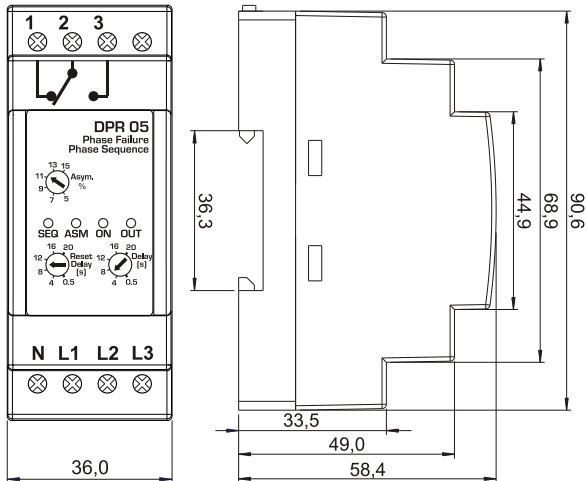
### ELECTRICAL INSTALLATION

- Do not install the unit close to high electromagnetic noise emitting devices like contactors, high current busbars, switchmode power supplies and the like. Although the unit is protected against electromagnetic disturbances, excessive disturbance can affect the operation and measurement precision.
- Use adequate cable section, at least 0.75mm<sup>2</sup> (AWG18).



Do not overload relay outputs. Use extra contactors if required.

## DIMENSIONS

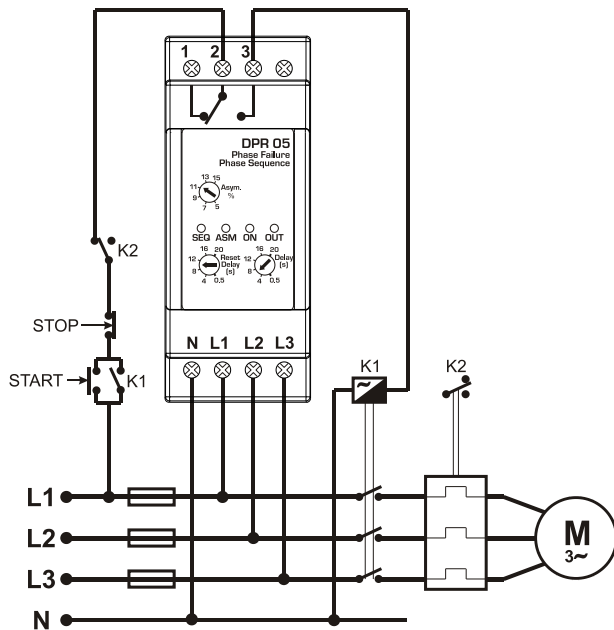


## LED INDICATORS

**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

## INSTALLATION DIAGRAM



## INPUTS AND OUTPUTS

**L1-L2-L3 :** Phase voltages inputs

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

## 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)

