OP441-V01

# selec

**900VPR-BL-U**

Operating Instructions

## FEATURES

- Over voltage, Under voltage, Over frequency, Under frequency, Phase Asymmetry, Phase failure, Neutral Loss, Phase sequence monitoring system etc.
- True RMS measurement
- Trip Time delay, Recovery Time delay, Power ON delay
- Adjustable switching Hysteresis
- Two separate alarm relays operation

## SPECIFICATIONS

**DISPLAY**
3 Digits, LCD with Backlight

**ELECTRICAL CONNECTION**
3Ø-3 wire, 3Ø-4 wire

**AUXILIARY SUPPLY**
85 – 270V AC/DC
50 / 60Hz

**OPERATING RANGE**
50 – 288V AC (L-N)
85 – 500V AC (L-L)

**FREQUENCY RANGE**
45 – 65Hz

**VA RATING**
4VA max.

**TRIP SETTINGS**

| | |
|---|---|
| Under Voltage | : 50 to 288V AC (L-N) [for 3Ø-4 wire] 85 to 500V AC (L-L) [for 3Ø-3 wire] |
| Over Voltage | : 50 to 288V AC (L-N) [for 3Ø-4 wire] 85 to 500V AC (L-L) [for 3Ø-3 wire] |
| Under Frequency | : 45 – 65Hz |
| Over Frequency | : 45 – 65Hz |
| Phase Asymmetry | : 5 – 30% |

**TIME SETTINGS**

| | |
|---|---|
| Power ON Delay | : 0.5 – 300sec. |
| Trip Time Delay | : 0 – 300sec. |
| Recovery Time | : 0 – 300sec. |
| Response Time | |
| Under Voltage | : < 120ms |
| Over Voltage | : < 120ms |
| Phase Asymmetry | : < 120ms |
| Phase loss | : < 200ms |
| Phase sequence | : < 250ms |

**HYSTERESIS**

| | |
|---|---|
| Voltage | : 1 – 40V |
| Frequency | : 0.2 – 2.0Hz |
| Asymmetry | : 2 – 20.0% |

**RESOLUTION**

| | |
|---|---|
| Voltage | : 1V |
| Frequency | : 0.1Hz |

**ACCURACY**

| | |
|---|---|
| Voltage | : ±1% ± 2digits |
| Frequency | : ±0.5% ± 1digit |
| Time | : ±5% of setting ±120ms |

(Trip Time Delay, Power ON Delay, Recovery Time Delay)

**OUTPUT SPECIFICATIONS**
2 Relays : Relay1 : 1C/O (SPDT)
Relay2 : 1C/O (SPDT)

**RELAY RATING**
NO (5A, 250V AC)
NC (3A, 250V AC)

**LED INDICATION**
LED1 : Continuously ON after trip
LED2 : Continuously ON after trip

**ENVIRONMENTAL SPECIFICATIONS**
- Indoor use
- Altitude of up to 2000 meters
- Pollution degree II

Temperature : Operating : -25°C to +55°C
Storage : -25°C to +70°C
Humidity : Up to 95% RH, non-condensing

**MECHANICAL SPECIFICATIONS**
No. of Push Buttons : 3
Size : 35mm width
Mounting : 35mm Din Rail Mount
Wire Size (max) : 4 sq.mm
Screw tightening torque : 0.5 N-M

**WEIGHT**
150 gms.

## SAFETY PRECAUTIONS

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not used in a manner specified by the manufacturer it might impair the protection provided by the equipment.

If there is physical damage to the unit then do not use it.

Read complete instructions prior to installation and operation of the unit.

## WIRING GUIDELINES

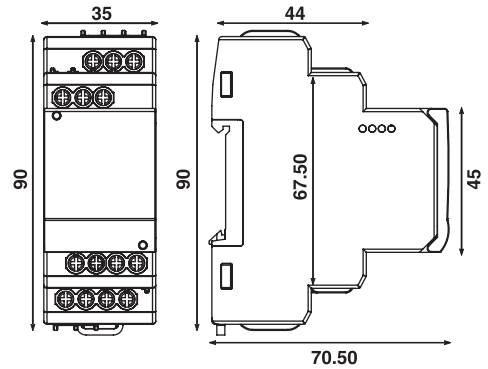
### WARNING

1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement.
2. Wiring shall be done strictly according to the terminal layout with shortest connections. Confirm that all connections are correct.

### CAUTION

1. To ensure the safe operation of unit, check the wiring and connections.

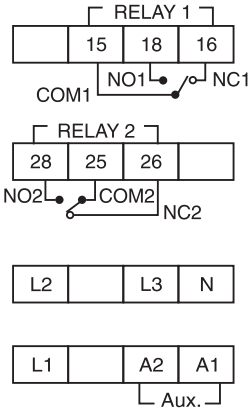
## DIMENSIONS ( All dimensions in mm )




## LED INDICATION CHART

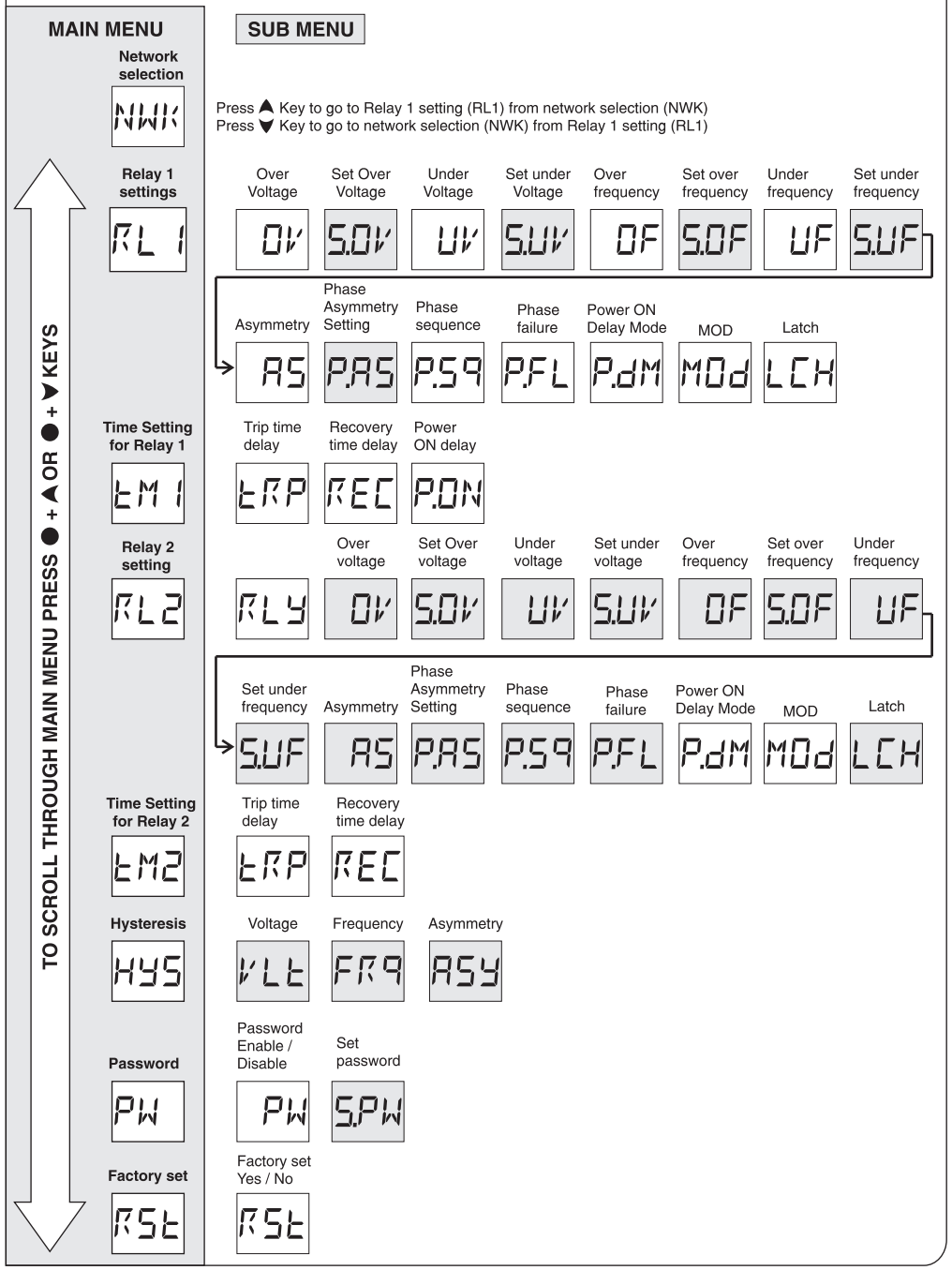
| Various Conditions | 'R1' LED | 'R2' LED |
|---|---|---|
| No fault | OFF | OFF |
| R1 Trip | ON | OFF |
| R2 Trip | OFF | ON |
| Both the Relay Trip (If Programed for Both Relay) | ON | ON |

## TERMINAL CONNECTIONS



## CONFIGURATION MENU

**Press ▲ + ▼ for 3sec. to enter or exit configuration menu.**




**Note :** Appearance of shaded menus dependant on selection of other parameters.

## SUB MENU

| **Network Selection (NWK)** | | | Press ▲ to enter sub menu from main menu | |
|---|---|---|---|---|
| Press ▲ or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value | | |
| **DISPLAY (For 1sec)** | **DESCRIPTION** | **DEFAULT VALUE** | **RANGE** | **CONDITION** |
| NWK | Network selection | 3P4 | 3P3 / 3P4 | |

| **Relay 1 (RL1) settings** | | | Press ▲ to enter sub menu from main menu | |
|---|---|---|---|---|
| Press ▲ or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value | | |
| **DISPLAY (For 1sec)** | **DESCRIPTION** | **DEFAULT VALUE** | **RANGE** | **CONDITION** |
| OV | Over voltage | > V ON R1 | ON / OFF | |
| S.OV | Set Over Voltage | > V 264 R1 | 85 - 500V(Default : 498) [For 3P3W system]<br>50 - 288V(Default : 264) [For 3P4W system] | This option will be prompted only when OV protection ON |
| UV | Under voltage | <V OFF R1 | ON / OFF | |
| S.UV | Set under voltage | <V 184 R1 | 85 - 500V(Default : 332) [For 3P3W system]<br>50 - 288V(Default : 184) [For 3P4W system] | This option will be prompted only when UV protection ON |
| OF | Over frequency | > ON R1 | ON / OFF | |
| S.OF | Set over frequency | > 55 R1 Hz | 45.0 - 65.0Hz | This option will be prompted only when OF protection ON |
| UF | Under frequency | < OFF R1 Hz | ON / OFF | |
| S.UF | Set under frequency | < 45 R1 Hz | 45.0 - 65.0Hz | This option will be prompted only when UF protection ON |
| AS | Asymmetry | < As ON R1 | ON / OFF | |
| P.AS | Phase Asymmetry Setting | V As 10.0 R1 % | 5.0 - 30.0% | This option will be prompted only when AS protection ON |
| P.S9 | Phase sequence | ON R1 | ON / OFF | |
| P.FL | Phase failure | ON R1 | ON / OFF | |

| DISPLAY (For 1sec) | DESCRIPTION | DEFAULT VALUE | RANGE | CONDITION |
|---|---|---|---|---|
| P.dM | Power 'ON' Delay Mode | OFF (R1) | ON / OFF | ON : NO<br>OFF : NC |
| MOd | MOD | ON (R1) | ON / OFF | ON : NC (During Trip)<br>OFF : NO (During Trip) |
| LCH | Latch | OFF (R1) | ON / OFF | If Latch is ON, user has to reset the unit manually when fault is removed |

**Time Setting for Relay 1 (TM1)** — Press ▲ to enter sub menu from main menu

Press ▲or ▼ to scroll through sub menu — Press ● + ▲ or ● + ▼ to change parameter value

| DISPLAY (For 1sec) | DESCRIPTION | DEFAULT VALUE | RANGE | CONDITION |
|---|---|---|---|---|
| tRP | Trip time delay | 3.0 s (R1 t) | 0.0 - 300s | |
| REC | Recovery time | 0.5 s (R1 t off) | 0.0 - 300s | |
| P.ON | Power ON delay | 0.5 s (ton) | 0.5 - 300s | Applicable for Relay 1 and Relay 2 |

**Relay 2 (RL2)** — Press ▲ to enter sub menu from main menu

Press ▲or ▼ to scroll through sub menu — Press ● + ▲ or ● + ▼ to change parameter value

| DISPLAY (For 1sec) | DESCRIPTION | DEFAULT VALUE | RANGE | CONDITION |
|---|---|---|---|---|
| RLY | Relay | RL 1 (R2) | RL1 / RL2 | If RL1 is selected, all the settings done for RL1 & TM1 will be automatically set for RL2 and no other parameter of RL2 & TM2 will be prompted. |
| OV | Over voltage | > V ON (R2) | ON / OFF | |
| S.OV | Set Over voltage | > V 264 (R2) | 85 - 500V(Default : 498) [For 3P3W system]<br>50 - 288V(Default : 264) [For 3P4W system] | This option will be prompted only when OV protection ON |
| UV | Under voltage | <V OFF (R2) | ON / OFF | |
| S.UV | Set under voltage | <V 184 (R2) | 85 - 500V(Default : 332) [For 3P3W system]<br>50 - 288V(Default : 184) [For 3P4W system] | This option will be prompted only when UV protection ON |

**Note :** Relay (RL2 ) submenus are not visible when its is selected as Relay 1 (RL1).

| DISPLAY (For 1sec) | DESCRIPTION | DEFAULT VALUE | RANGE | CONDITION |
|---|---|---|---|---|
| OF | Over frequency | > ON (R2 Hz) | ON / OFF | |
| S.OF | Set over frequency | > 55 (R2 Hz) | 45.0 - 65.0Hz | This option will be prompted only when OF protection ON |
| UF | Under frequency | < OFF (R2 Hz) | ON / OFF | |
| S.UF | Set under frequency | < 45 (R2 Hz) | 45.0 - 65.0Hz | This option will be prompted only when UF protection ON |
| AS | Asymmetry | < As ON (R2) | ON / OFF | |
| PAS | Phase Asymmetry Setting | V As 10.0 (R2 %) | 5.0 - 30.0% | This option will be prompted only when AS protection ON |
| PSQ | Phase sequence | ON (R2) | ON / OFF | |
| PFL | Phase failure | ON (R2) | ON / OFF | |
| P.dM | Power 'ON' Delay Mode | OFF (R2) | ON / OFF | ON : NO<br>OFF : NC |
| MOd | MOD | ON (R2) | ON / OFF | ON : NC (During Trip)<br>OFF : NO (During Trip) |
| LCH | Latch | OFF (R2) | ON / OFF | If Latch is ON, user has to reset the unit manually when fault is removed |

**Time Setting for Relay 2 (TM2)** — Press ▲ to enter sub menu from main menu

Press ▲or ▼ to scroll through sub menu — Press ● + ▲ or ● + ▼ to change parameter value

| DISPLAY (For 1sec) | DESCRIPTION | DEFAULT VALUE | RANGE | CONDITION |
|---|---|---|---|---|
| tRP | Trip time delay | 3.0 s (R2 t) | 0.0 - 300s | |
| REC | Recovery time | 0.5 s (R2 t off) | 0.0 - 300s | |

| Hysteresis (HYS) | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value | | |
| **DISPLAY (For 1sec)** | **DESCRIPTION** | **DEFAULT VALUE** | **RANGE** | **CONDITION** |
| VLt | Hysteresis for voltage | 1.0 | 1.0 - 40.0V | |
| FR9 | Hysteresis for frequency | 0.2 | 0.2 - 2.0Hz | |
| ASy | Hysteresis for Asymmetry | 2.0 | 2.0 - 20.0% | |

| Password (PW) | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value | | |
| **DISPLAY (For 1sec)** | **DESCRIPTION** | **DEFAULT VALUE** | **RANGE** | **CONDITION** |
| PW | Password | diS | ENB / DIS | Enable / Disable password protection option |
| S.PW | Set password | 0 | 0-999 | Will be prompted only when Password option is enabled |

**NOTE** : PW option will be asked when the user enter the config. menu if PW option is enabled in the config menu and the user has to enter the password which he has set in the S.PW (set password) option.

| Factory set (RST) | | Press ▲ to enter sub menu from main menu | | |
|---|---|---|---|---|
| Press ▲or ▼ to scroll through sub menu | | Press ● + ▲ or ● + ▼ to change parameter value | | |
| **DISPLAY (For 1sec)** | **DESCRIPTION** | **DEFAULT VALUE** | **RANGE** | **CONDITION** |
| rSt | Reset (Factory set) | NO | YES / NO | |

**TRIP VALUE SETTING (Online)** **Press ▲ key for 3 sec. to enter or exit Trip Value Setting menu :**

| Press ▲or ▼ to scroll through main menu | | Press ● + ▲ or ● + ▼ to change parameter value | | |
|---|---|---|---|---|
| **DISPLAY (For 1sec)** | **DESCRIPTION** | **DEFAULT VALUE** | **RANGE** | **CONDITION** |
| LCK | LOCK | YES | YES / NO | This option will prompted first when the user enters the trip setting menu. User has to set NO after which he can access the trip setting menu. |
| S.OV | Set over voltage for Relay 1 | > V 264 R1 | 85 - 500V(Default : 498) [For 3P3W system]<br>50 - 288V(Default : 264) [For 3P4W system] | |
| S.UV | Set under voltage for Relay 1 | <V 184 R1 | 85 - 500V(Default : 332) [For 3P3W system]<br>50 - 288V(Default : 184) [For 3P4W system] | |

| Press ▲or ▼ to scroll through main menu | | Press ● + ▲ or ● + ▼ to change parameter value | | |
|---|---|---|---|---|
| **DISPLAY (For 1sec)** | **DESCRIPTION** | **DEFAULT VALUE** | **RANGE** | **CONDITION** |
| S.OV | Set over voltage for Relay 2 | > V 264 R2 | 85 - 500V(Default : 498) [For 3P3W system]<br>50 - 288V(Default : 264) [For 3P4W system] | |
| S.UV | Set under voltage for Relay 2 | <V 184 R2 | 85 - 500V(Default : 332) [For 3P3W system]<br>50 - 288V(Default : 184) [For 3P4W system] | |
| tRP | Trip time delay for Relay1 | 3.0 s R1 t | 0.0 - 300s | |
| tRP | Trip time delay for Relay2 | 3.0 s R2 t | 0.0 - 300s | |
| LCK | LOCK | NO | YES / NO (In this option if YES is selected by the user, then whenever the user enters the Trip Value Setting, initially LOCK option will be prompted. The user will have to set NO after which he can access the trip setting menu. If the user wants to disable LOCK option, he can set NO when LOCK option is prompted after TRP option.) | |

**NOTE :** If Values are changed, the same setting in config menu will also changed and vice versa, also if RL1 is selected for RL2 in config menu no parameter of Relay 2 will be prompted in the above trip value setting.

| **ONLINE KEYS** | Individual parameters can be viewed with every press of ▼ keys. |
|---|---|

| PARAMETER | SYMBOL |
|---|---|
| *Average Voltage | L1 L2 L3 |
| Voltage (L1-phase) | L1 |
| Voltage (L2-phase) | L2 |
| Voltage (L3-phase) | L3 |
| Voltage (L1-L2 phase) | L1 L2 |
| Voltage (L2-L3 phase) | L2 L3 |
| Voltage (L1-L3 phase) | L1 L3 |
| Frequency | Hz |
| Phase Asymmetry | As % |

*** Default Page** : This page is displayed after 3 sec. from other online page.
For 3P4W system average of L-N voltages is shown.
For 3P3W system average of L-L voltages is shown.

| **TRIP INDICATION** | Trip Indication on press of ▲ key : Trip value will be displayed till the key is pressed. |
|---|---|
| **RESET** | Press ● key for 3sec. to reset manually (Applicable only if Latch is ON) |

**Master Password :** 753

In Trip value setting & configuration menu, if no key pressed for 30 sec. then unit resumes online mode.

(Specifications subject to change as development is a continuous process.)

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