OP2036-V01

selec 900VPR-2-280/600V-CE-RoHS

Operating Instructions



FEATURES

- Over voltage, Under voltage, Over frequency, Under frequency, Phase Asymmetry, Phase failure Phase sequence and Neutral loss monitoring in system etc.
- True RMS measurement
- Power ON delay, Trip time delay and Recovery time delay.
- Adjustable switching hysteresis
- Two separate relays operation.

SPECIFICATIONS

DISPLAY
3 Digits, Liquid Crystal Display
ELECTRICAL CONNECTION
3Ø-3 wire, 3Ø-4 wire & 1Ø-2 wire
AUXILIARY SUPPLY
Self powered
OPERATING RANGE
3Ø-3 wire (L-L): 280 – 600V AC
3Ø-4 wire (L-N):160 – 300V AC
1Ø-2 wire (L1-N1): 160 – 300V AC
FREQUENCY RANGE
45 - 65 Hz
VA RATING
< 50VA
TRIP SETTINGS
Under Voltage : 280 to 600V AC (L-L) [for 3Ø-3 wire]
160 to 300V AC (L-N) [for 3Ø-4 wire]
160 to 300V AC (L1-N1) [for 1Ø-2 wire]
Over Voltage : 280 to 600V AC (L-L) [for 3Ø-3 wire]
160 to 300V AC (L-N) [for 3Ø-4 wire]
160 to 300V AC (L1-N1) [for 1Ø-2 wire]
Under Frequency : 45 – 65Hz
Over Frequency : 45 – 65Hz
Phase Asymmetry : 5 - 99%

ASYMMETRY CALCULATION FORMULA

$$\text{Asymmetry \%} : \frac{\text{Max. voltage - Avg. voltage}}{\text{Avg. voltage}} \times 100$$

TIME SETTINGS
Power ON Delay : 0 - 999 sec
Trip time delay : 0 - 999 sec
Recovery time : 0 - 999 sec
Response Time
Under Voltage :<120ms
Over Voltage : <120ms
Phase Asymmetry : <120ms
Phase loss : <250ms
Phase Sequence : <250ms
HYSTERESIS
Voltage : 1.0V – 99.9V
Frequency : 0.2 – 2.0Hz
Asymmetry : 2.0 - 20%
RESOLUTION
Voltage : 1V
Frequency : 0.1Hz
ACCURACY
Voltage : ±1% of full range
Frequency : ±0.3Hz
Time : ±5% of setting ± 250ms
(Recovery Time, Trip time Delay, Power ON Delay, Response 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 (Green) : Power ON
LED2 (Red) : Relay1 (Continuously ON after trip)
LED3 (Red) : Relay2 (Continuously ON after trip)
ENVIRONMENTAL SPECIFICATIONS
- Indoor use
- Altitude of up to 2000 meters
- Pollution degree II

Temperature : Operating : 0 to 55°C
Storage : -20°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 : 135 gms.
Product standard : IEC60255-1

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

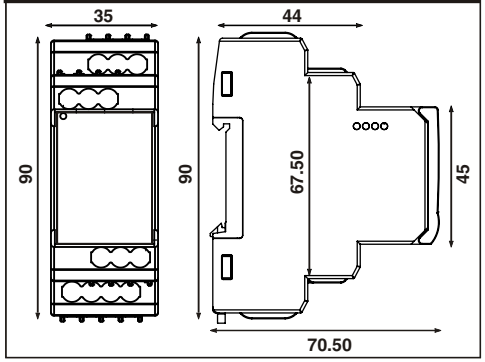
WARNING

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

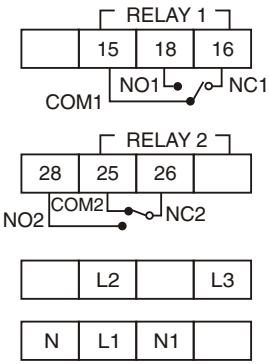
Various Conditions	Power LED	'R1' LED	'R2' LED
No fault	ON	OFF	OFF
Trip (Relay 1)	ON	ON	OFF
Trip (Relay 2)	ON	OFF	ON
Trip (If programmed for both relays)	ON	ON	ON

DISPLAY INDICATION CHART

Fault Display	Description
t.OV	Over Voltage
t.UV	Under Voltage
t.OF	Over Frequency
t.UF	Under Frequency
t.AS	Phase Asymmetry
t.SQ	Phase Sequence
t.PL	Phase Loss
t.NL	Neutral Loss

Note: During fault,average value & type of fault will display alternately for 1 sec.

TERMINAL CONNECTIONS

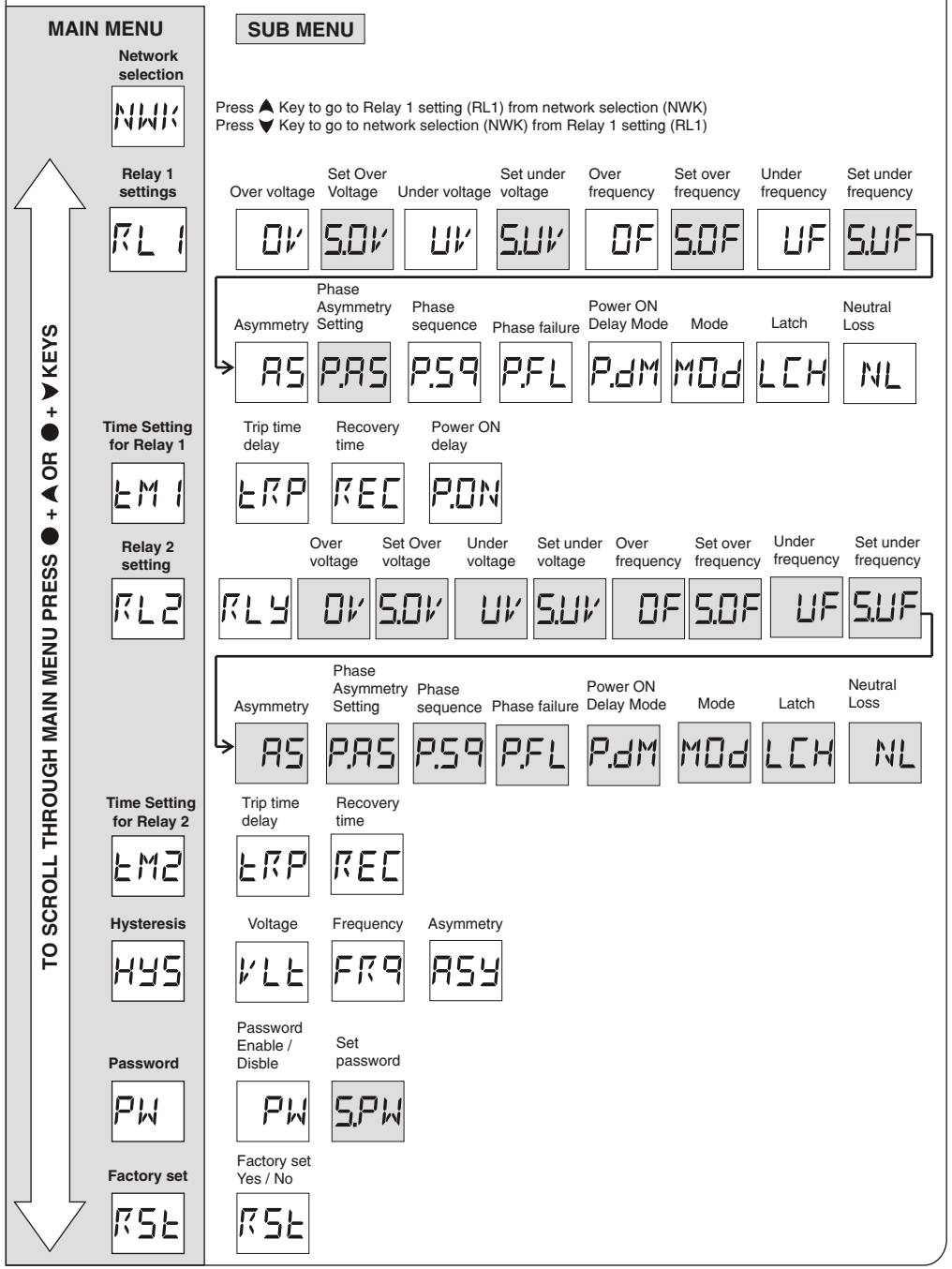


ORDER CODE INFORMATION

Product	Supply	Certification	
		CE	cULus LISTED
900VPR-2-280/600V	280-600V	■	-

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	1P2 / 3P3 / 3P4	On selection of 3 phase 4 wire network, neutral loss page will be display for RLY1 & RLY2 section.

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 288 R1	280 to 520V AC (Default value : 498V) [for 3Ø-3 wire] 160 to 300V AC (Default value : 288V) [for 3Ø-4 wire] 160 to 300V AC (Default value : 288V) [for 1Ø-2 wire]	This option will be prompted only when OV option is made ON
UV	Under voltage	<V OFF R1	ON / OFF	
S.UV	Set under voltage	<V 192 R1	280 to 520V AC (Default value : 332V) [for 3Ø-3 wire] 160 to 300V AC (Default value : 192V) [for 3Ø-4 wire] 160 to 300V AC (Default value : 192V) [for 1Ø-2 wire]	This option will be prompted only when UV option is made ON
OF	Over frequency	> OFF R1 Hz	ON / OFF	
S.OF	Set over frequency	> 55 R1 Hz	45.0 - 65.0Hz	This option will be prompted only when OF option is made 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 option is made ON
AS	Asymmetry	As ON R1	ON / OFF	

DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
PAS	Phase Asymmetry Setting	As 10.0 R1 %	5.0 - 99%	This option will be prompted only when AS option is made ON
PSQ	Phase sequence	ON R1	ON / OFF	
PFL	Phase failure	ON R1	ON / OFF	
PdM	Power 'ON' Delay Mode	OFF R1	ON / OFF	ON : NO OFF : NC
MOd	MOD	ON R1	ON / OFF	ON : NC(During trip) 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
NL	Neutral loss	ON R1	ON / OFF	If 3 phase 4 wire network is selected then neutral loss function is displayed in RLY1 & RLY2 config menu.

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	s 3.0 R1 t	0 - 999sec	
REC	Recovery time	s 0.5 R1 t off	0 - 999sec	
PON	Power ON delay	s 0.5 R1 ton	0 - 999sec	Applicable for Relay 1 & 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	RL1 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	
SOV	Set Over voltage	> V 288 R2	280 to 600V AC (Default value : 323V) [for 3Ø-3 wire] 160 to 300V AC (Default value : 184V) [for 3Ø-4 wire] 160 to 300V AC (Default value : 184V) [for 1Ø-2 wire]	This option will be prompted only when OV option is made ON

Note : Relay 2 (RL2) Default values shown are applicable when Relay 2 (RL2) selected as Relay 1 (RL1)

DISPLAY (For 1sec)	DESCRIPTION	DEFAULT VALUE	RANGE	CONDITION
UV	Under voltage	<V OFF R2	ON / OFF	
SUV	Set under voltage	<V 192 R2	280 to 520V AC (Default value : 332V) [for 3Ø-3 wire] 160 to 300V AC (Default value : 192V) [for 3Ø-4 wire] 160 to 300V AC (Default value : 192V) [for 1Ø-2 wire]	This option will be prompted only when UV option is made ON
OF	Over frequency	> OFF R2 Hz	ON / OFF	
SOF	Set over frequency	> 55 R2 Hz	45.0 - 65.0Hz	This option will be prompted only when OF option is made ON
UF	Under frequency	< OFF R2 Hz	ON / OFF	
SUF	Set under frequency	< 45 R2 Hz	45.0 - 65.0Hz	This option will be prompted only when UF option is made ON
AS	Asymmetry	As ON R2	ON / OFF	
PAS	Phase Asymmetry Setting	As 10.0 R2 %	5.0 - 99.9%	This option will be prompted only when AS option is made ON
PSQ	Phase sequence	ON R2	ON / OFF	
PFL	Phase failure	ON R2	ON / OFF	
PdM	Power 'ON' Delay Mode	OFF R2	ON / OFF	ON : NO OFF : NC
MOd	MOD	OFF R2	ON / OFF	ON : NC(During trip) 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
NL	Neutral loss	ON R2	ON / OFF	If 3 phase 4 wire network is selected then neutral loss function is displayed in RLY1 & RLY2 config menu.

Note : In 3P4W, when neutral is absent all L-N voltage are zero.

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 - 999sec	
REC	Recovery time	0.5 s (R2 t off)	0 - 999sec	

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 V (H)	1.0 - 99.9V	
FRQ	Hysteresis for frequency	0.2 (H)	0.2 - 2Hz	
ASY	Hysteresis for Asymmetry	2.0 As (H %)	2 - 20%	

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	000	000-999	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 — **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
S.OV	Set over voltage for Relay 1	> V 288 R1	280 to 520V AC (Default value : 498V) [for 3Ø-3 wire] 160 to 300V AC (Default value : 288V) [for 3Ø-4 wire] 160 to 300V AC (Default value : 288V) [for 1Ø-2 wire]	

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 288 R2	280 to 520V AC (Default value : 498V) [for 3Ø-3 wire] 160 to 300V AC (Default value : 288V) [for 3Ø-4 wire] 160 to 300V AC (Default value : 288V) [for 1Ø-2 wire]	
S.UV	Set under voltage for Relay 2	< V 192 R2	280 to 520V AC (Default value : 332V) [for 3Ø-3 wire] 160 to 300V AC (Default value : 192V) [for 3Ø-4 wire] 160 to 300V AC (Default value : 192V) [for 1Ø-2 wire]	
tRP	Trip time delay for Relay1	3.0 s (R1 t)	0 - 999s	
tRP	Trip time delay for Relay2	3.0 s (R2 t)	0 - 999s	

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 %

In configuration menu, if no key pressed for 30 sec. Then unit resumes online mode.

TRIP INDICATION	Trip Indication on press of ▲ key : Trip value will be displayed for 3 sec.
RESET	Press ● key for 3sec. to reset manually
Master Password	753

***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.
For 1P2W system,L1-N1 voltages is shown.

(Specifications are subject to change, since development is a continuous process.)

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