

INSTALLATION INSTRUCTION MANUAL UNDER / OVER VOLTAGE RELAY

minilec[®]



D1 VCR1



**D2 VCT1
(3Ø - 3 W / 3Ø - 4 W)**



S2 VMR4



S2 VMR5



Thank you for selecting and purchasing Minilec make Under / Over Voltage Relay. The following installation instructions would guide you in installing Under / Over Voltage Relay (i.e. D2 VCT1/D1 VCR1/S2 VMR4/S2 VMR5) and making the best use of it. The above models are used in 3Ø 3 W Or 3Ø 4W OR 1Ø 2W system supply where under / over voltage protection is required. D2 VCT1 is a 3Ø - 3W / 3Ø - 4W (Selectable), D1 VCR1 is a 1Ø 2W (L&N), S2 VMR4 is a 3Ø - 3W / S2 VMR5 is a 3Ø - 4W, Under/Over voltage Relays

It offers protection against :
Under Voltage Condition
Over Voltage Condition
Neutral Fail Condition

D2 VCT1/S2 VMR4/S2 VMR5 are also having facility of test mode, Fail Safe / Non fail safe Relay operation & 2 CO Or 1 CO + 1 CO relay contact selection. (common/separate relay selection mode is not applicable for model with 2CO relay output.)
These relays are an auxiliary relay & is to be used along with the motor starter/contacting control ckt only. The effective working of D2 VCT1 will depend on efficient working of the control ckt. Before installing D2 VCT1 check whether the motor starter/control ckt is operating perfectly by starting the motor with the "START" push button and switching it off by "STOP" push button. If the motor does not "START" or "STOP" on respective operations the starter/control ckt needs to be serviced.

Do not install Relay with faulty motor starter/control ckt.

TRIP SETTING, TRIP DELAY AND RESETTING
Refer respective Table.

MOUNTING

Relays can be RAIL mount or PANEL mounted. See Fig. for DIN RAIL & Panel Mounting. Also see Fig for mounting on and releasing from DIN RAIL.

CAUTION -

- Ensure that Relays are -
- Not installed near any heat sources like Burner, Sunlight, Electric arc etc.
- Not subjected to abnormal vibrations.
- Not subjected to direct heat, sunlight, rain, stormy wind and dust.
- Installed as near to the starter as possible.

ELECTRICAL CONNECTIONS OF RELAYS -
See respective Fig. for terminal details of Relays. Even See respective Fig. for installation in power and Control wiring of Relays. Do all connections in Power Off condition Connect L1, L2 , L3 phases at terminal no. 1, 2 , and 3 (N at terminal no.4 in case of 3Ø - 4W). The output relay contacts 13, 15 & 16, 18 are to be connected in series For 3Ø - 3W, connect link at terminal no.5 & 6. For 3Ø - 4W, remove link at terminal no.5 & 6.

. D2 VCT1 DEFAULT SETTING IN PROGRAM MODE

- Auto Reset.
 - Non Fail Safe Relay Operation.
 - 1 CO + 1CO For 1CO UV,1CO-OV.
- Note :**
Refer Table 2 to change above default settings in program mode

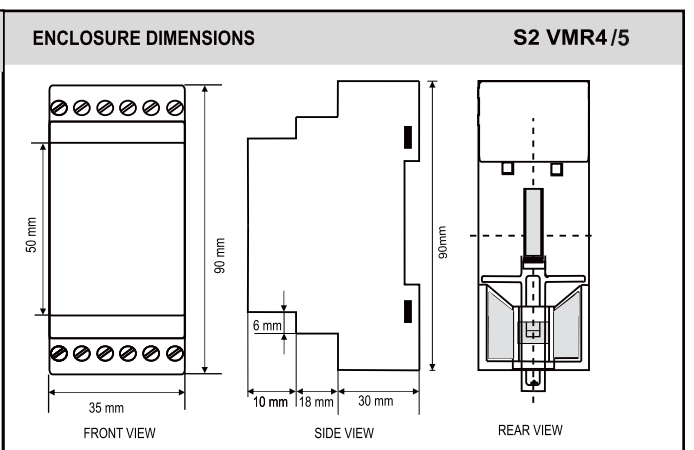
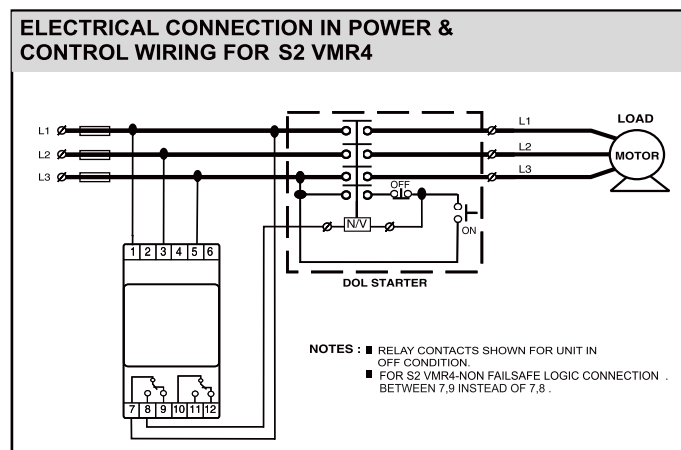
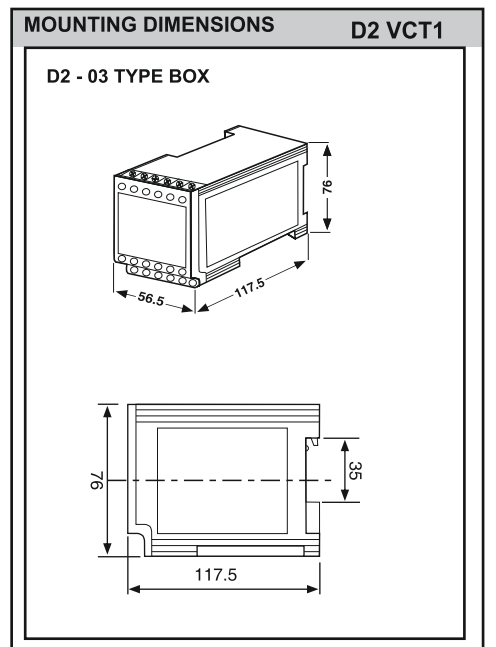
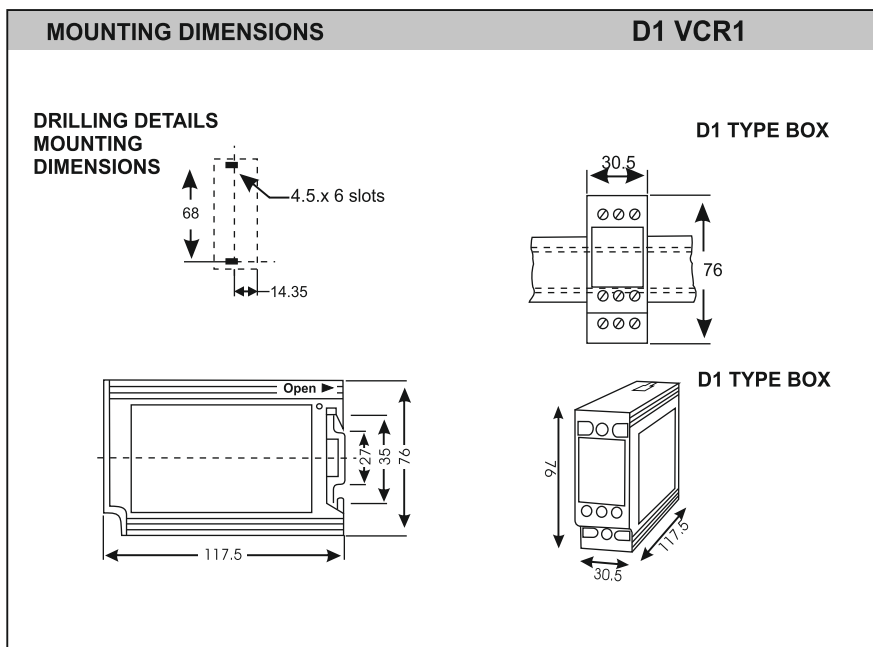
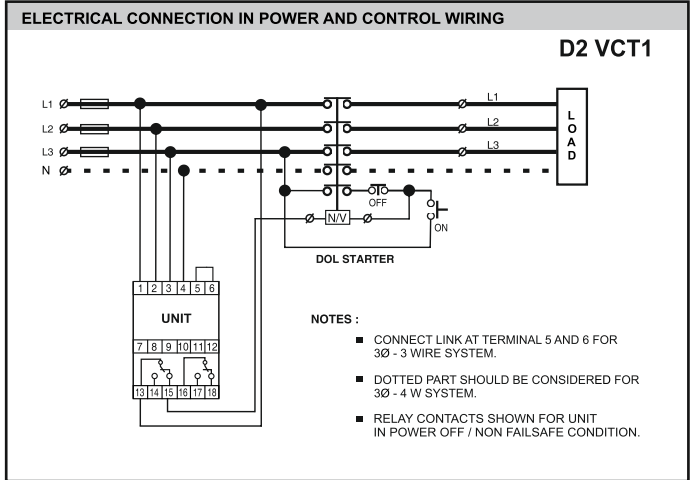
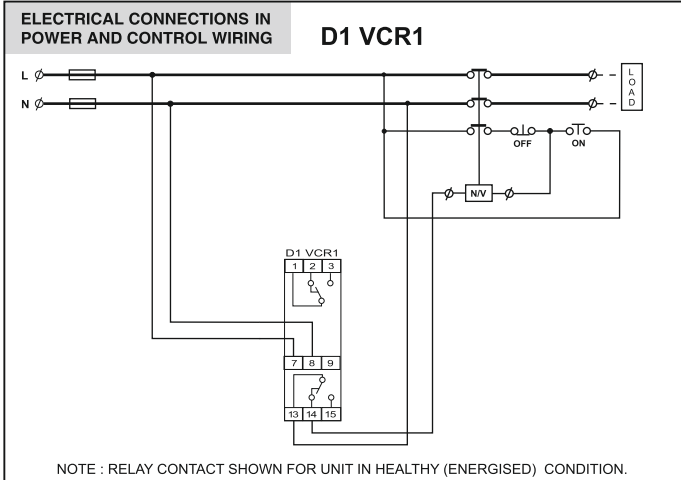
| TECHNICAL SPECIFICATIONS OF | | D2 VCT1 | D1 VCR1 | S2 VMR4 | S2 VMR5 |
|--|--|---|--|--|--|
| 1. System Supply : | | 100 - 110 - 120 / 220 - 230 - 240 / 380 - 415 - 440 VAC ± 20 % | 110/220/230/240 VAC, +20%, -25% | Model #1: 380-415-440 vac ± 20 % Model #2: 220-230-240 vac ± 20 % 3phase, 3 wire | 100-120/220-240/380-440VAC ± 20 %, 3 phase,4 wire system |
| 2. Aux. Supply : | | In - Built | In - Built | In - Built | In - Built |
| 3. Frequency : | | 50 / 60 Hz | 50/60/ Hz ±3% | 48 to 63 hz. | : 48 TO 63 HZ. |
| 4. Output Relay Contacts : | | (1 CO + 1CO) / 2CO | 2 CO | (1 CO + 1CO) / 2CO | (1 CO + 1CO) / 2CO |
| 5. Output contact rating : | | 5 Amp, 240VAC [Resistive] | 5A, 240 VAC [Resistive] | 5 Amp, 240VAC [resistive] | : 5 AMP, 240VAC [Resistive] |
| 6. Power consumption : | | 26 VA (max.) | | | |
| 7. Test Facility : | | Refer Table 2 | NA | Test Push Botton | Test Push Botton |
| 8. Under / Over Voltage Trip Setting : | | Refer Table 2 | UV: 75% to 95% of system supply OV: 105 % to 120% of System supply | Refer Table 1 | Refer Table 1 |
| 9. Power ON Delay : | | 1 to 10 Sec. [Variable] | NA | 1 - 10 sec, ± 5 % of full scale | 1 to 10 Sec. [Variable] |
| 10. Trip Time Delay : UV/OV : | | 1 to 10 Sec. [Variable] | 3.5 se. (± 1.5 sec) | UV/ OV - 1 - 10 sec, | ± 5 % of full Scale |
| 11. Neutral Fail : | | 2 sec ± 1.5 sec [Fixed] | NA | NA | NA |
| 12. Set Accuracy : UV & OV : Power ON : Trip delay : | | ± 2 % of set value(± 3 % of set value for 110VAC system) ± 5 % of full scale(± 10% for 1st marking of P. ON Dly) ± 5 % of full scale | ± 2 % of set value. | ± 2 % Of Set Value ± 5% Of Full Scale ± 5 % Of full scale (± 10 % for 1st marking) | ± 2 % Of Set Value ± 5% Of Full Scale ± 5 % Of full scale (± 10 % for 1st marking) |
| 13. Resetting : | | Auto / Manual Reset | Auto reset | Auto / Manual Reset | Auto / Manual Reset |
| 14. Reset Gap : | | 3 % ± 1 % of set value | 3% (± 1%) of sys. supply. | For UV/OV = 3 %, ± 1 % | 3 % ± 1 % Of Set Value. |
| 15. Indications: ON : NF : UV : OV : | | Steady On : Power ON Steady On : Neutral Fail Steady On : Under voltage Steady On : Over Voltage | POWER ON (Green) : Power On UV (RED) : Under Voltage Trip OV (Red) : Over Voltage Trip | POWER ON (Green) : Power On UV (RED) : Under Voltage Trip OV (Red) : Over Voltage Trip | : ON : UV /NF(Steady - UV & Flashing - NF) : OV |
| 16. Additional Features : | | Fail Safe / Non Fail Safe Relay 2 CO / 1 CO + 1CO | NA | Fail Safe / Non Fail Safe Relay 2 CO / 1 CO + 1CO | Fail Safe / Non Fail Safe Relay 2 CO / 1 CO + 1CO |
| 17. Enclosure : | | ABS | ABS | S2 SERIES, ABS, PC-ABS | : S2 Series, ABS / PC-ABS. |
| 18. Dimensions (mm) : Overall : Mounting : | | 76 X 56.5 X 117.5 66.6 X 46 35mm Rail Mounting & Panel Mounting | Overall : 76x30.5x117.5 Mounting : 68 center to center 35mm Rail Mounting & Panel Mounting | temperature -5 °C to +60 °C Humidity upto 95% R.H. Overall (LXWXD) = 90 x 35 x 60 35mm Rail Mounting & Panel Mounting 35mm Rail Mounting & Panel Mounting | : 35 X 90 X 60 35mm Rail Mounting & Panel Mounting 35mm Rail Mounting & Panel Mounting |
| 19. Weight (Approx.) : 300 gms. | | 300 gms. | 180 gms. | 150 gms. | : 150 gms. |
| 20. Operating Conditions : Temperature : Humidity : | | - 5 °C To + 60 °C Up To 95 % Rh | : - 5 ° C TO + 60 ° C : UP TO 95 % Rh. | Temperature = -5°c to +60°c Humidity = upto 95 % rh. | : - 5 ° C TO + 60 ° C : UP TO 95 % Rh. |
| 21. Life Expectancy : | | 0.5 x10 ⁶ operations at 100% rating rating. | 0.5 x10 ⁶ operations at 100% rating rating. | 0.5 x10 ⁶ operations at 100% rating rating. | 0.5 x10 ⁶ operations at 100% rating rating. |
| 22. Environment | | Pollution Degree 2 | | Pollution Degree 2 | Pollution Degree 2 |

| TRIP SETTING, TRIP DELAY AND RESETTING | | D1 VCR1 | |
|--|-----------------|---|---|
| | | Under Voltage | Over Voltage |
| 1. | Cut off at | Site selectable between 75% to 95% (of monitored supply) (± 2 % of set value) | Site selectable between 105% to 120% (of monitored supply) (± 2 % of set value) |
| 2. | Trip Time Delay | 3.5 sec.(± % of set value) | 3.5 sec.(± % of set value) |
| 3. | Auto Reset Gap | Cut off value plus 3% (±1%) of system. supply | Cut off value Less 3% (±1%) of system. supply |

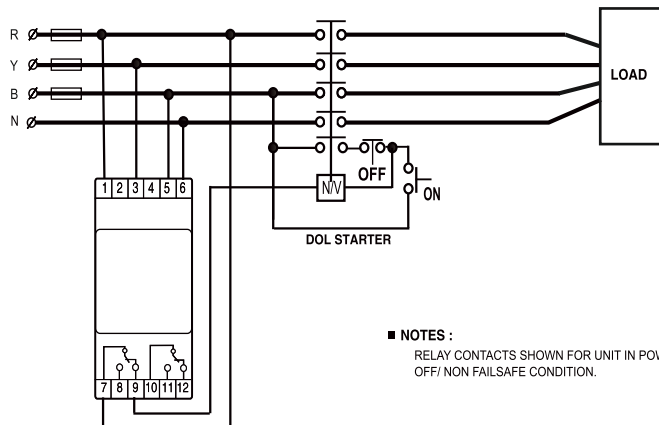
| Table 1 : TRIP SETTINGS | | D2 VCT1 | S2 VMR4 | S2 VMR5 |
|---------------------------|---|---|--|---------|
| Parameters | Under Voltage | | Over Voltage | |
| | Cut off at (For 3Ø - 3 W) | 285 - 425 VAC FOR 380 - 415 - 440 VAC 165 - 225 VAC FOR 220 - 230 - 240 VAC 75 - 115 VAC FOR 100 - 110 - 120 VAC [Variable] | 400 - 550 VAC FOR 380 - 415 - 440 VAC 230 - 300 VAC FOR 220 - 230 - 240 VAC 105 - 150 VAC FOR 100 - 110 - 120 VAC [Variable] | |
| Cut off at (For 3Ø - 4 W) | 165 - 245 VAC FOR 380 - 415 - 440 VAC 95 - 135 VAC FOR 220 - 230 - 240 VAC 45 - 65 VAC FOR 100 - 110 - 120 VAC [Variable] | 230 - 320 VAC FOR 380 - 415 - 440 VAC 130 - 170 VAC FOR 220 - 230 - 240 VAC 60 - 90 VAC FOR 100 - 110 - 120 VAC [Variable] | | |
| Power on delay | 1 to 10 sec. ± 5 % Of Full Scale [Variable] | 1 to 10 sec. ± 5 % Of Full Scale [Variable] | | |
| Trip time delay | 1 to 10 sec. ± 5 % Of Full Scale [Variable] | 1 to 10 sec. ± 5 % Of Full Scale [Variable] | | |
| Auto reset gap | 3 % ± 1 % of set value | 3 % ± 1 % of set value | | |

WARRANTY - AGAINST ALL MANUFACTURING DEFECTS FOR 18 MONTHS FROM DATE OF SUPPLY OR 12 MONTHS FROM INSTALLATION WHICHEVER IS EARLIER

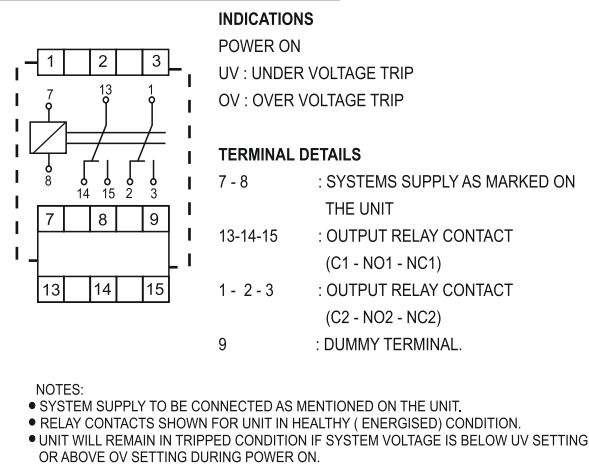
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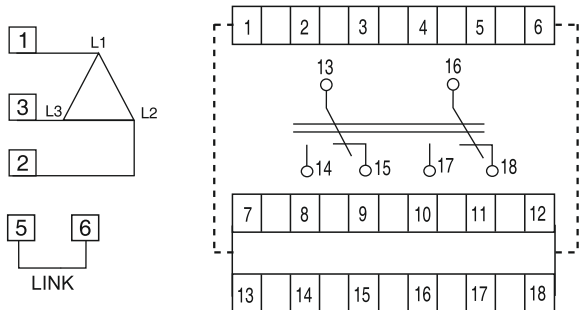
ELECTRICAL CONNECTION IN POWER & CONTROL WIRING S2 VMR5



CONNECTIONS DIAGRAM D1 VCR1



TERMINAL DETAILS OF 3Ø - 3 W D2 VCT1



INDICATIONS

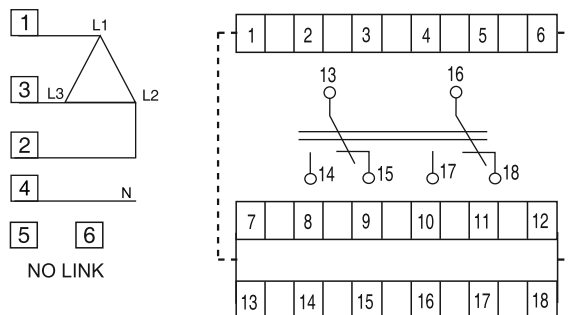
- 'ON' : Steady on : Power On
- 'NF' : -----
- 'UV' : Steady on : Under Voltage
- 'OV' : Steady on : Over Voltage

TERMINAL DETAILS

| TERMINAL NO. | D2 VCT1 |
|--------------|-------------------------------|
| 1 - 2 - 3 | L1-L2-L3 PHASE VOLTAGE INPUT. |
| 4 | DUMMY |
| 5, 6 | LINK |
| 7 - 12 | DUMMY |
| 13 - 14 - 15 | C1 - NO1 - NC1 |
| 16 - 17 - 18 | C2 - NO2 - NC2 |

■ **NOTE : RELAY CONTACTS SHOWN FOR UNIT IN POWER OFF/ NON FAILSAFE CONDITION.**

TERMINAL DETAILS OF 3Ø - 4 W D2 VCT1



INDICATIONS

- 'ON' : Steady on : Power On
- 'NF' : Steady on : Neutral Fail
- 'UV' : Steady on : Under Voltage
- 'OV' : Steady on : Over Voltage

TERMINAL DETAILS

| TERMINAL NO. | D2 VCT1 |
|--------------|-------------------------------|
| 1 - 2 - 3 | L1-L2-L3 PHASE VOLTAGE INPUT. |
| 4 | NEUTRAL POINT |
| 5, 6 | NO LINK |
| 7 - 12 | DUMMY |
| 13 - 14 - 15 | C1 - NO1 - NC1 |
| 16 - 17 - 18 | C2 - NO2 - NC2 |

■ **NOTE : RELAY CONTACTS SHOWN FOR UNIT IN POWER OFF/ NON FAILSAFE CONDITION.**

COMPLIANCE TO STANDARDS

| | TEST | IEC STD. |
|-----|--|------------|
| 1. | EFT Test of Auxiliary Supply | 61000-4-4 |
| 2. | Surge Test of Auxiliary Supply | 61000-4-5 |
| 3. | Voltage Interruption, Variation & Dip Test | 61000-4-11 |
| 4. | ESD Test (Contact Discharge) | 61000-4-2 |
| | ESD Test (Air Discharge) | 61000-4-2 |
| 5. | H.V. Test (Dielectric Test) | 60255-5 |
| 6. | Insulation Resistance Test | 60255-5 |
| 8. | Dry Heat Test | 60068-2-2 |
| 9. | Damp Heat test (Steady State) | 60068-2-30 |
| 10. | Damp Heat test (cyclic test) | 60068-2-78 |

Table 2

| PROGRAM MODE SETTING | | | | S2 VMR4 | S2 VMR5 |
|-------------------------------------|------------|-----------|--------|---|---------|
| PRESS PRG./ RST P.B. FOR | LED STATUS | | | MODE | |
| | ON LED | UV/NF LED | OV LED | | |
| | ● | ○ | ○ | Run Mode | |
| ≥ 8 SEC | ☆ | ☆ | ☆ | Program Mode | |
| ≤ 4 SEC | ● | ● | ● | Test Facility | |
| WAIT 3 SEC | ○ | ○ | ○ | Exit Test Mode. | |
| ≥ 4 SEC | ☆ | ○ | ○ | Auto / manual Reset selection | |
| ≤ 4 SEC | ●/○ | ○ | ○ | ● Auto Reset / ○ Manual Reset | |
| ≥ 4 SEC | ○ | ☆ | ○ | Fail Safe/ Non Fail Safe selection | |
| ≤ 4 SEC | ○ | ●/○ | ○ | ● Fail Safe /○ Non Fail Safe | |
| ≥ 4 SEC | ○ | ○ | ☆ | Common or Separate Relay selection | |
| ≤ 4 SEC | ○ | ○ | ●/○ | ● Relay 1, Relay 2 FOR UV & OV ○ Relay1 for UV & Relay2 for OV | |
| ≥ 4 SEC | ☆ | ○ | ○ | MODE setting Cycle repeat. | |
| IF P. B. IS NOT PRESSED FOR >10 SEC | ☆ | ☆ | ☆ | AUTO EXIT program mode after flashing led. | |

● LED ON ○ LED OFF ☆ LED FLASHING

Note:- 1) S2 VMR5 BY DEFAULT IN NON FAIL SAFE MODE.
2) OV IS NOT APPLICABLE FOR 2CO.

TABLE 2

| PRODUCT | LED STATUS | | |
|---------|------------|--------|--------|
| | L1-LED | L2-LED | L3-LED |
| S2 VMR5 | ON | UV/NF | OV |
| S2 VMR4 | ON | UV | OV |

Instructions for Screw Gun torque adjustment -
 • Torque should be 1 Nm max.
 • Max 2.5 sq. mm size wire can be used.

WEEE (Waste Electrical & Electronic Equipment)
 Regulations: After end of equipment life, recycle or disposal needs to be done as per guidelines or handover it to Ewaste processing authorized agencies. For more details contact us.

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