sub-Zero ®

INDIA
www.pvrcontrols.com

OPERATING INSTRUCTIONS

sub-Zero ®

VMRC- 10/1/3/3-CT

GENERAL DESCRIPTION

VMRC-10/3 is three phase LVM and VMRC-10/1 is single phase LVM.

VMRC-10/3 is three phase Line voltage monitor (LVM) used to protect device from Single Phasing, voltage unbalance, phase reversal and under/over voltage. It shows real time voltages between phase and neutral.

VMRC-10/3-CT is three phase Line voltage monitor (LVM) with an additional overload protection facility with external CT Board.

VMRC-10/1 Single phase LVM used to protect device from under/over voltage faults it shows real time voltages readings.

There is an alarm relay given to extend the faults. Features are easily understood by examples in the instruction below.

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NOTE :
A : VMRC 10/1 (Single Phase)
B : VMRC 10/3 (Three Phase)
C : VMRC 10/3-CT (Three Phase with CT)

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Function: To go to program mode.

Press and hold PRG / SET Key for 2 seconds.

Display will show rEF & flash. To go to other parameters, use UP/DOWN keys.

PRG
SET

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rEF Parameter	Function: To set Reference voltage.
To change the rEF parameter, press set key.	Use UP/DOWN keys to set desired value. Base reference voltage to calculate under voltage and over voltage values.

VMRC-10/1

Min	Max	Fac.
220V	250V	240V

VMRC-10/3
VMRC-10/3-CT

Min	Max	Fac.
381V	415V	415V

Min and Max value will change according to display type for settings.

Example : L-L, Min= 381 Max= 415.

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oU Parameter	Function: To set Overvoltage Limits.
To change the oV parameter, press set key.	Use UP/DOWN keys to set desired value. If the a/c voltages goes above this limit will trip respective a/c on Overvoltage("Ov") fault.

VMRC-10/1

Min	Max	Fac.
5V	75V	20V

VMRC-10/3
VMRC-10/3-CT

Min	Max	Fac.
5V	75V	35V

Example : Over voltage is calculated depending on Reference voltage + Ov value**.** i.e, Ov Set Point = Ref + Ov , When controller trip on Ov Fault it will recover when input voltage fall below (Ref + (Ov /2)**.**

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uU Parameter	Function: To set Undervoltage Limits.
To change the uV parameter, press set key.	Use UP/DOWN keys to set desired value. If the a/c voltages goes below this limit will trip respective a/c on undervoltage("Uv") fault.

VMRC-10/1

Min	Max	Fac.
5V	75V	20V

VMRC-10/3
VMRC-10/3-CT

Min	Max	Fac.
5V	75V	35V

Example : Under voltage is calculated depending on Reference voltage - Uv value**.** i.e Uv Set Point = Ref - Uv , When controller trip on Uv Fault it will recover when input voltage above (Ref – (Uv /2)**.**

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unb Parameter	Function: To set Un Balance value. (Only for 10/3 & 10/3-CT)
To change the unb parameter, press set key.	Use UP/DOWN keys to set desired value. Unbalance fault raised when voltage difference between any of two phases goes above Unb value and recovers when the difference is less than (UNB/2).

VMRC-10/3

Min	Max	Fac.
10V	120V	60V

VMRC-10/3-CT

Min	Max	Fac.
10V	120V	60V

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ttd Parameter	Function : To set time delay.
To change the ttd parameter, press the set key.	Use UP/DOWN keys to set desired value. Time delay provided to avoid false triggering, when any fault last more than TTD value then only fault is raised and this fault is applicable to Under voltage, Over voltage and Unbalance fault.(i.e., In case of Phase Loss or Phase sequence fault alarm will come immediately).

Min	Max	Fac.
0Sec	60Sec	10Sec

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tdr Parameter	Function : To set fault recover delay. (Only for 10/3 & 10/3-CT)
To change the tdr parameter, press the set key.	Use UP/DOWN keys to set desired value. Time delay provided to add delay in fault recover time, to avoid sudden fault triggering and reset.

Min	Max	Fac.
0Sec	60Sec	10Sec

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oL1 Parameter	Function : To set current overload1 value. (Only for 10/3-CT)
To change the oLd1 parameter, press the set key.	Use UP/DOWN keys to set desired value. If current input crosses this value then depending on dL1 delay parameter overload fault get set.

Min	Max	Fac.
1.0A	oL2 -1.0A	15.0A

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dL1 Parameter	Function : To set current sensing delay for oL1. (Only for 10/3-CT)
To change the dL1 parameter, press the set key.	Use UP/DOWN keys to set desired value. When current input crosses oL1 value, after dL1 time delay, oL fault set and alarm relay get activated.

Min	Max	Fac.
0Sec	120Sec	20Sec

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oL2 Parameter	Function : To set current overload2 value. (Only for 10/3-CT)
To change the oL2 parameter, press the set key.	Use UP/DOWN keys to set desired value. If current input crosses this value then depending on dL2 delay parameter overload fault get set.

20A

Min	Max	Fac.
oL1 +1.0A	20.0A	18.0A

50A

Min	Max	Fac.
oL1 +1.0A	50.0A	25.0A

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dL2 Parameter	Function : To set current sensing delay for oL2. (Only for 10/3-CT)
To change the dL2 parameter, press the set key.	Use UP/DOWN keys to set desired value. When current input crosses oL2 value, after dL2 time delay, oL fault set and alarm relay get activated.

Min	Max	Fac.
0Sec	120Sec	10Sec

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CCb Parameter	Function : To set current calibration. (Only for 10/3-CT)
To change the ccb parameter, press the set key.	Use UP/DOWN keys to set desired value. This parameter provided to calibrate current reading.

Min	Max	Fac.
-2.0A	2.0A	0.0A

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CrY/C-r Parameter	Function : To set calibration of voltage r-Y or r phase. (Only for 10/3, 10/3-CT)
To change CrY parameter, press the SET key.	Use UP/DOWN keys to set desired value. This parameter provided to calibration voltage reading. When dsP is L-L CrY value get set. When dsP is L-n C-r value get set.

Min	Max	Fac.
-30V	30V	00V

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CYb/C-Y Parameter	Function : To set calibration of voltage Y-b or Y phase. (Only for 10/3, 10/3-CT)
To change Cyb parameter, press the SET key.	Use UP/DOWN keys to set desired value. This parameter provided to calibration voltage reading. When dsP is L-L CYb value get set. When dsP is L-n C-Y value get set.

Min	Max	Fac.
-15V	15V	00V

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Crb/C-b Parameter	Function : To set calibration of voltage r-b or b phase. (Only for 10/3, 10/3-CT)
To change Crb parameter, press the SET key.	Use UP/DOWN keys to set desired value. This parameter provided to calibration voltage reading. When dsP is L-L Crb value get set. When dsP is L-n C-b value get set.

Min	Max	Fac.
-15V	15V	00V

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ALn Parameter	Function : To CT Alarm type. (Only for 10/3-CT)
To change the ALn parameter, press the set key.	Use UP/DOWN keys to set desired value. Auto Mode = Controller will reset after fault is reset. Manual Mode = This mode incase of OL fault controller will go manual mode. Retrials Mode = In this mode controller will do set number of retrials and then go to manual mode. **Note : Press RST key to reset CT Alarm.**

Min	Max	Fac.
Aut	rtr	Aut

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dSP Parameter	Function : To set view display mode. (Only for 10/3, 10/3-CT)
To change the dsP parameter, press the set key.	Use UP/DOWN keys to set desired value. There are two type of display output, Line to Line Voltage (L-L) and Line to Neutral (L-n), Depending on this parameter REF parameter also changes.

Min	Max	Fac.
L-L	L-n	L-L

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FS PARAMETER	Function : To restore the default settings of the controller.
To change the FS parameter, press the set key.	Use UP/DOWN keys to set desired value. When set to 1, all parameters are programmed to factory values.

Min	Max	Fac.
no	YES	no

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End Parameter	Function : To end programming.
To end programming, press the SET key.	Once the set key is pressed, the controller goes into the normal mode and displays the voltage readings.

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Technical Data for
Single Phase Voltage Monitor (VMRC- 10/1)

Main Features : Voltage Monitoring.
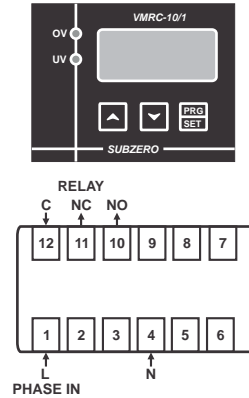Uv and Ov Detection.
Settable Uv and Ov Parameter.

Input : Single Phase AC supply.
Output : Alarm Relay : 5A Resistive.

Application : Under voltage and Over voltage detection.

General Specification :
Input Voltage Range from 100VAC to 265VAC.
Mounting : Din rail mounting.
Connections : Screw terminals : ≤ 2.5sqmm one wire/ terminal only.

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Front View & Connetion Diagram for
Single Phase Voltage Monitor (VMRC- 10/1)

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Technical Data for
Three Phase Voltage Monitor (VMRC- 10/3)

Main Features : Voltage Monitoring.
Phase Sequence Monitoring.
Phase Loss and Phase Unbalance detection.
Uv and Ov Detection.
Settable Uv and Ov Parameter.

Input : R Y B Phases and Neutral Input.
Output : Alarm Relay : 5A Resistive.

Application : Voltage and phase sequence monitoring and controlling.
Under voltage and Over voltage detection.

General Specification :
Input Voltage Range from 173VAC to 458VAC.
Mounting : Din rail mounting.
Connections : Screw terminals : ≤ 2.5sqmm one wire/ terminal only.

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Front View & Connetion Diagram for
Three Phase Voltage Monitor (VMRC- 10/3)
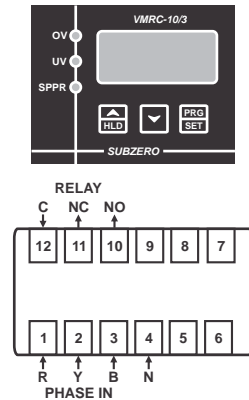
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Technical Data for
Three Phase Voltage Monitor (VMRC- 10/3-CT)

Main Features : Voltage Monitoring.
Phase Sequence Monitoring.
Phase Loss and Phase Unbalance detection.
Uv and Ov Detection.
Settable Uv and Ov Parameter.

Input : R Y B Phases and Neutral Input.
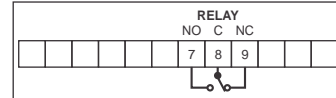3 CT Board 20Amp.
1 CT Board 50Amp.
Output : Alarm Relay : 5A Resistive.
Application : Voltage and phase sequence monitoring and controlling.
Under voltage, Over voltage and Overload detection.

General Specification :
Input Voltage Range from 173VAC to 458VAC.
Mounting : Din rail mounting.
Connections : Screw terminals : ≤ 2.5sqmm one wire/ terminal only.

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Front View & Connetion Diagram for
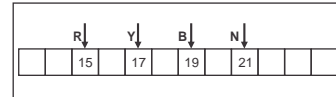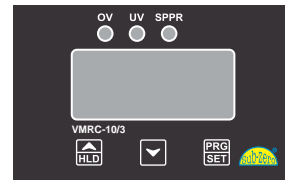## Three Phase Voltage Monitor (VMRC- 10/3-CT)
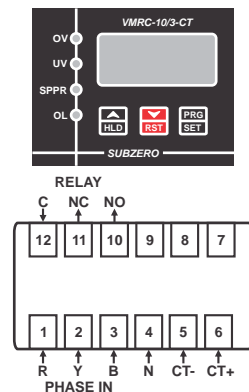
28

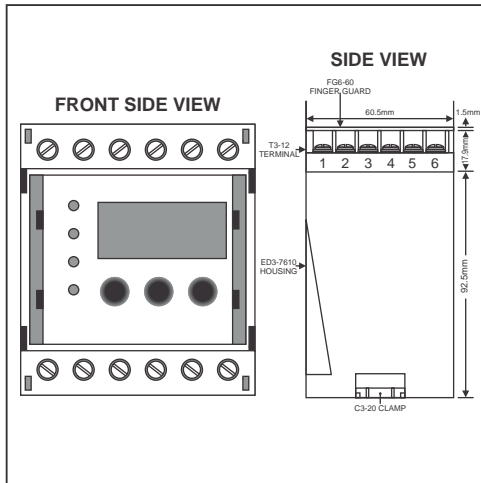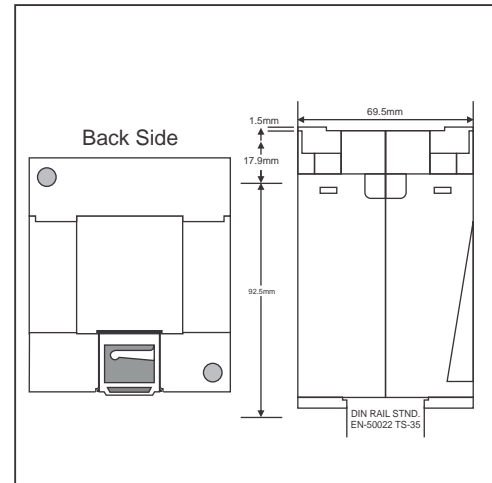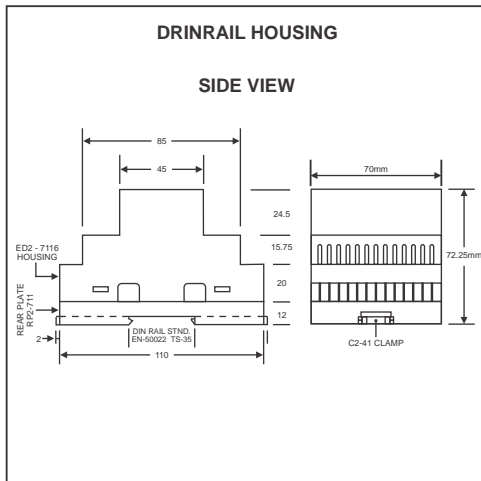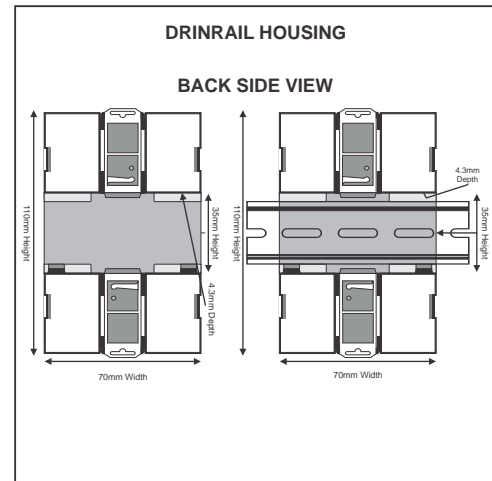## Technical Data for
Three Phase Voltage Monitor (VMRC- 10/3)

Main Features : Voltage Monitoring.
Uv and Ov Detection.
Settable Uv and Ov Parameter.

Input : Three Phase AC supply with Neutral.

Output : Alarm Relay : 5A Resistive.

Application : Under voltage and Over voltage detection.

General Specification :
Input Voltage Range from 100VAC to 265VAC.
Mounting : Din rail mounting.
Connections : Screw terminals : $\leq$ 2.5sqmm one wire/terminal only.

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Front View & Connetion Diagram for
Three Phase Voltage Monitor (VMRC- 10/3)

OV   UV   SPPR

VMRC-10/3

HLD   PRG SET   sub zero

R↓	Y↓	B↓	N↓			
	15	17	19	21		

RELAY
NO   C   NC

			7	8	9		

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FRONT SIDE VIEW

SIDE VIEW

FG6-60
FINGER GUARD

60.5mm   1.5mm

T3-12
TERMINAL   1 2 3 4 5 6   17.9mm

ED3-7610
HOUSING

92.5mm

C3-20 CLAMP

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Back Side

1.5mm   69.5mm

17.9mm

92.5mm

DIN RAIL STND.
EN-50022 TS-35

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DRINRAIL HOUSING

SIDE VIEW

85

45

70mm

24.5

ED2 - 7116
HOUSING   15.75   72.25mm

REAR PLATE
RP2-711   20

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2   DIN RAIL STND.
EN-50022 TS-35   C2-41 CLAMP

110

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DRINRAIL HOUSING

BACK SIDE VIEW

110mm Height   35mm Height   4.3mm Depth

110mm Height   35mm Height

4.3mm Depth

70mm Width   70mm Width

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Controller : Controller should be installed in a place protected by vibration, water and corrosive gasses and where ambient temperature does not exceed the values specified in the technical data.

CAUTION

WIRING : The alarm wires should never be installed in a conduit next to control or power supply lines. The electrical wiring should be done as shown in the diagram. The power supply circuit should be connected to a protection switch. The terminals admit wires of upto 2.5sq. mm.

WARNING : Improper wiring may cause irreparable damage and personal injury. Kindly ensure that wiring is done by qualified personnel only.

Maintenance : Cleaning : Clean the surface of the controller with a soft moist cloth. Do not use abrasive detergents, petrol, alcohol or solvents.

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OUR OTHER PRODUCTS

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Cold Room Controller
Chiller Controller
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Ball Valves
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Solenoid Valves

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