Techno® SINCE 1988

METERS & ELECTRONICS

Technical Specification: SINGLE PHASE VAF WITH PROTECTION RELAY

Model	**TMCB-031**
Display Parameters & Range	Parameters — Range Voltage — 30V – 300V Current — 10% - 120% of CTR Frequency — 45Hz – 55Hz ON Hour — Up to 99999999.59.59 (H.M.S) RUN Hour — Up to 99999999.59.59 (H.M.S) FAULT/s settings Voltage — Low, High, Low+High Current — Low, High, Low+High Frequency — Low, High, Low+High ON Hour / RUN Hour
Features	• True RMS Measurement • Three Line Display for V, I, F simultaneously • 4 Digits in each display line for better resolution • CT Ratio Programming (Range: 5/5 to 4000/5) • Auto scrolling & Manual mode selectable • Auto decimal shifting for current (from 0.01A to 1A) • Programmable Relay (Potential Free Contact) for V, I, F, and ON Hour / RUN Hour Faults • Automatic and Manual Relay Reset mode • Bright Seven segment LED display for better readability
Accuracy	Class 1.0
Display	Three Line Seven Segment display, Size 0.56”
CT Selection	Programmable through KeyPad
Connection	1-phase, 2 wire
Aux. Supply	170V – 260Vac, 50Hz
Dimension	96mm(H) x 96mm(W) x 75mm(D)
Weight	

Connection Diagram:

1	2	3	4	5	6	7	8	9
	NC	**C**	**NO**		**N**			**L**
	RELAY				**INPUT VOLTAGE (AC)**			
Wiring Detail								
				CT- (5A)			**Aux.Supply 170-260V 50Hz**	
				S1	**S2**			
10	11	12	13	14	15	16	17	18

Operation Manual:

1. Press A/M key to select *Manual Mode* or *Auto Mode*. *Auto* LED indicates *Auto Mode*.
2. In *Auto Mode*, following pages are displayed sequentially for 20 sec.
    a. Voltage, Current, Frequency
    b. RUN HOUR
    c. ON HOUR
3. In *Manual Mode*, repeatedly press Scroll key till the required mode is displayed.
4. To enter programming mode, press Prog key for 10 seconds.
5. In Programming mode, the parameter name is displayed in first line and its value is displayed in second line.

CT Ratio Programming

6. The first parameter is CT ratio. The first line show **Ct.Pr** i.e. CT Primary Current. Second line displays the current programmed value. The default value is 100. Use ⇨ key to shift the cursor to right. Use ⇧ key to increment the digit at current cursor position. Press Prog key to move to next parameter. NOTE that parameters can be changed / edited only when LOCK (last parameter) is OFF. When LOCK is ON, then the parameters are read-only. To edit them, got to the LOCK parameter by repeatedly pressing Prog key and change the lock value to OFF. Press Prog key once again and the meter will show the first parameter i.e. **Ct.Pr** which can be edited now.

Relay Reset Mode

7. The next parameter is Relay Reset Mode. The display shows **Auto** in the first line and its value (**ON** or **OFF**) in second line. Use ⇨ key or ⇧ key to set the desired value. Press Prog key to move to next parameter.

Current Fault

8. The next parameter is Current fault parameter. The display shows **rELy** in first line with Current fault LED ON. Second line shows the current relay setting (**OFF, Hi, Lo** or **LoHi**). Use ⇨ key or ⇧ key to set the desired setting. Press Prog key to move to next parameter. If Current relay is set OFF, then meter jumps to Voltage Fault.
9. If Current relay is set to **Hi** or **LoHi**, meter displays **Set.H** in the first line and its value (Ampere) in second line. Use ⇨ key and ⇧ key to set the desired value. Press Prog key to move to next parameter.
10. If Current relay is set to **Lo** or **LoHi**, meter displays **Set.L** in the first line and its value (Ampere) in second line. Use ⇨ key and ⇧ key to set the desired value. Press Prog key to move to next parameter.
11. The next parameter is Delay for Current relay. The display shows **DELy** in the first line and its value (seconds) in second line. Use ⇨ key or ⇧ key to set the desired value. Press Prog key to move to next parameter.
12. The next parameter is Current Hysteresis if Auto Relay Reset is selected **ON**. The display shows **HySt** in the first line and its value (Ampere) in second line. Use ⇨ key or ⇧ key to set the desired value. Press Prog key to move to next parameter.

Motor Protection Mode

13. If Current relay is set to **LoHi**, meter displays **Prot** in the first line and its value (**ON** or **OFF**) in second line. Use ⇨ key or ⇧ key to set the desired value. Press Prog key to move to next parameter.

Voltage Fault

14. The next parameter is Voltage fault parameter. The display shows **rELy** in first line with voltage fault LED ON. Second line shows the Voltage relay setting (**OFF, Hi, Lo** or **LoHi**). Use ⇨ key or ⇧ key to set the desired setting. Press Prog key to move to next parameter. If Voltage relay is set OFF, then meter jumps to Unbalanced Voltage Fault.
15. If Voltage relay is set to **Hi** or **LoHi**, meter displays **Set.H** in the first line and its value (Volt) in second line. Use ⇨ key and ⇧ key to set the desired value. Press Prog key to move to next parameter.
16. If Voltage relay is set to **Lo** or **LoHi**, meter displays **Set.L** in the first line and its value (Volt) in second line. Use ⇨ key and ⇧ key to set the desired value. Press Prog key to move to next parameter.
17. The next parameter is Delay for Voltage relay. The display shows **DELy** in the first line and its value (seconds) in second line. Use ⇨ key or ⇧ key to set the desired value. Press Prog key to move to next parameter.
18. The next parameter is Voltage Hysteresis if Auto Relay Reset is selected **ON**. The display shows **HySt** in the first line and its value (Volt) in second line. Use ⇨ key or ⇧ key to set the desired value. Press Prog key to move to next parameter.

Frequency Fault

19. The next parameter is Frequency fault parameter. The display shows **rELy** in first line with Frequency fault LED ON. Second line shows the Frequency relay setting (**OFF, Hi, Lo** or **LoHi**). Use ⇨ key or ⇧ key to set the desired setting. Press Prog key to move to next parameter. If Frequency relay is set OFF, then meter jumps to Phase Sequence Fault.
20. If Frequency relay is set to **Hi** or **LoHi**, meter displays **Set.H** in the first line and its value (Hertz) in second line. Use ⇨ key and ⇧ key to set the desired value. Press Prog key to move to next parameter.
21. If Frequency relay is set to **Lo** or **LoHi**, meter displays **Set.L** in the first line and its value (Hertz) in second line. Use ⇨ key and ⇧ key to set the desired value. Press Prog key to move to next parameter.
22. The next parameter is Delay for Frequency relay. The display shows **DELy** in the first line and its value (seconds) in second line. Use ⇨ key or ⇧ key to set the desired value. Press Prog key to move to next parameter.
23. The next parameter is Frequency Hysteresis if Auto Relay Reset is selected **ON**. The display shows **HySt** in the first line and its value (Hertz) in second line. Use ⇨ key or ⇧ key to set the desired value. Press Prog key to move to next parameter.

ON Hour / RUN Hour Fault (To set the Relay at desired ON / RUN Hour)

24. The next parameter is ON Hour or RUN Hour fault parameter. The display shows **hour** in first line with Hour fault LED ON. Use ⇨ key or ⇧ key to set ON Hour / RUN Hour / OFF.
    If Hour relay is required to set at ON Hour, Press Prog key when the display shows **on hour** in second & third line. After pressing Prog key, the display will show the already stored value of ON Hour in hours only (not in min./sec). Use ⇨ key and ⇧ key to set the desired value.

If Hour relay is required to set at RUN Hour, Press Prog key when the display shows **run hour** in second & third line. After pressing Prog key, the display will show the already stored value of RUN Hour in hours only (not in min./sec). Use ⇨ key and ⇧ key to set the desired value.
(Note: ON Hour / RUN Hour relay will always set in manual reset mode)
Press Prog key to move to next parameter.

Program Lock

25. The next parameter is Program Lock parameter. The display shows **LoC** in first line. Second line shows the its value (**OFF** or **ON**). Use ⇨ key or ⇧ key to set the desired setting. To save the parameters and exit, press Prog key continuously for 3 seconds. To move to first parameter, press Prog key once