Instruction Manual

VAF433-T / VAF433-K

sub-Zero Precision Control, always

Introduction

The VAF is a panel mounted 96 x 96mm Digital Panel Meter for the measurement of important electrical parameters like AC Voltage, AC Current, RPM, Frequency and Power Factor VAF can be configured and Programmed On site for the following:
PT Primary, PT Secondary, CT Primary, CT Secondary (5A or 1A) and System Type 3 phase 3W or 4W or single-phase system.
The front panel has Four keys using which the user can scroll through different screens and configure the product.

Introduction

WIRING: The probe and its corresponding 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.

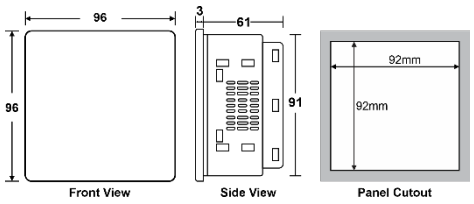
Maintenance: Cleaning: Clean the surface of the controller with a soft moist cloth. Do not use abrasive detergents, petrol, alcohol or solvents.

Notice: The information in this document is subject to change in order to improve reliability, design or function without prior notice and does not represent a commitment on the part of the company. In no event will the company be liable for direct, indirect, special, incidental or consequential damage arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages. No part of this manual may be reproduced or transmitted in any form or by any means without the prior written permission of the company.

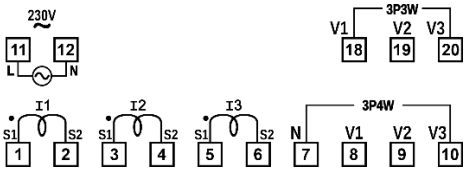
Controller: Controller should be installed in a place protected by vibration, water and corrosive gasses and where ambient temperature does not exceed the values specified in the technical data.

Probe: To give a correct reading, the probe must be installed in a place protected from thermal influences, which may affect the temperature to be controlled.

Dimensions & Panel Cutout



Connection Diagram



Index

Sr. No.	Parameter	Description
		Technical Specification.
		User Interface.
		Home Page Screen Description
1		Parameter setting mode.
2	SYS	Network selection 3P-4W, 3P-3W&1P-2W.
3	CT.P	Select CT primary ratio.
4	PT.P	Select PT primary ratio.
5	PT.S	Select PT secondary ratio.
6	no. PoL	Select number of poles.
7	rSt rHr	Clear run hours.
8	rSt FCt	Restore factory defaults
		Error Messages

Technical Specification

Housing : **Front Cover:** Polycarbonate Plastic
Back Cover: ABS Plastic
Dimensions : **Frontal:** 96 X 96mm, **Depth:** 61mm
Panel Cutout : 92 X 92mm
Mounting : Flush panel mounting with Fasteners
Protection : IP65 Front
Connections : Terminal connectors.
< 2.5sq mm terminal only with U-type lugs.
Display : 3 X 17mm 7 segment WHITE display, 15 Iconic LEDs for Indication
3 X 17mm 7 segment RED display, 8 Iconic LEDs for Indication
Data storage : Non-volatile flash memory
Operating temp. : 0°C to 60°C (non-condensing)
Operating humidity : 20% to 85% (non-condensing)
Storage temp. : -25°C to 60°C (non-condensing)
Supply Voltage : 230 Vac ± 10% , 50/60Hz Standard.
Wiring Input : 3ø-4W, 3ø-3W system.

Measuring Range

Input Rated Voltage : 11 to 375 V AC (L-N)
: 19 to 649 V AC (L-L)
Input Rated Current : Nominal 5A AC
CT Primary : 5 A to 10 kA
CT Secondary : 5 A
PT Primary : 100 V to 500 kV
PT Secondary : 100 to 375 V AC (L-L)
Electrical Connection : 3ø-4W, 3ø-3W, 2ø-3W, 1ø-2W.

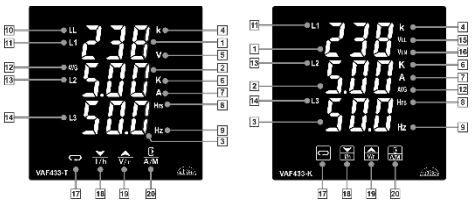
Resolution

Current / Voltage : Resolution depends upon CT, PT Primary settings
RPM : 0.1
Run Hour : 0.1 Hr

Accuracy

Voltage : ± 0.5% of F.S. ± 2 digits.
Current & Average Current : ± 1% of F.S. ± 2 digits
Frequency : ± 0.1 Hz ± 1 digit
Run Hour : ± 1%
RPM : ± 0.5%
Display Scrolling : Automatic or Manual (Programmable)
Power Consumption : 1.5VA Max
RPM : 1350 to 1950
Pole: 0
(Range: 0-98, selectable in steps of 2)
Frequency : 40-70 Hz
Run Hours : 0 to 99999.9 Hrs
Burden : 0.5VA @5A per phase

User Interface



Sr. No.		Description
1		Electrical parameters like AC Voltage, AC Current, RPM, Frequency and Power Factor will be seen as Per screen no and auto or manual mode. Kindly refer Home Page Descriptor.
2		
3		
4	k	Unit Kilo Volts
5	V	Unit Volts (Only for T model)
6	K	Kilo Ampere
7	A	Ampere
8	Hrs	Unit for Run Hours
9	Hz	Frequency units Hertz
10	LL	Line to Line value of corresponding Parameter (only for T model)
11	L1	Line to Neutral value of First Phase
12	AVG	Average value of corresponding parameter
13	L2	Line to Neutral value of Second Phase
14	L3	Line to Neutral value of Third Phase
15	VLL	Line to line voltage
16	VLN	Line to neutral voltage
17	⮌	**Next key:** **In Manual Mode:** To scroll for Next Screen. **In Program Mode:** To scroll to Next Parameter. **Note:** Kindly refer 'Home Page Screen Description' for further details.
18	I/h	**Down key/ I/ h:** **In Normal Mode (Auto/Manual):** Press this key for 1 second, the First Screen Displays phase current of three phases. Line to neutral and line to line voltage of three phases are displayed one by one. **Press this key for 3 seconds,** to display Run Hours (for non-zero poles). In Program Mode: To increase Parameter value. **Note:** To return back to current page, press for 3 seconds.
19	V/r	**Up key:** **In Normal Mode (Auto/Manual):** Press this key for 1 second. The First Screen displays line to neutral voltage of three phases. The Second Screen displays line to line voltage of three phases. **Press this key for 3 seconds.** Displays rpm for non-zero poles. **In Program Mode:** To increase Parameter value. **Note:** To return back to current page, press for 3 seconds.
20	A/M	**Exit key:** **In Normal Mode:** Press this key for 4 seconds to toggle between Automatic/Manual Mode. **In Program Mode:** To save the changed Parameter and exit to Normal mode.

Home Page Screen Description

Automatic Mode / Manual Mode Settings:
Press A/M mode for 4 seconds to toggle between Automatic/Manual Mode.
Note: By Default, unit operates in automatic mode. In automatic mode online pages scroll automatically at the rate of 5 sec per page. In automatic mode if any key is pressed, unit temporarily switched to manual mode and the appropriate page is displayed.

In Automatic Mode:

1. Display Descriptions in 3Ø – 4W:

1st Screen	Displays Line to Neutral voltage of all 3 Phase
2nd Screen	Displays Line to Line voltage of all 3 Phase
3rd Screen	RPM
4th Screen	Displays current of all 3 Phase
5th Screen	Displays Run Hours
6th Screen	Displays Line to Neutral voltage, current of first Phase
7th Screen	Displays line to neutral voltage, current of second Phase
8th Screen	Displays line to neutral voltage, current of third Phase
9th Screen	Displays average line to neutral voltage, average current of three phase and frequency.
10th Screen	Displays average line to line voltage, average current of three phases and frequency of present phase.

2. Display Descriptions in 3Ø – 3W:

1st Screen	Displays Line to line voltage of all 3 Phase
2nd Screen	RPM
3rd Screen	Displays Line to line current of all 3 Phase
4th Screen	Displays run hours
5th Screen	Displays Line to line voltage, current and frequency of first and second Phase
6th Screen	Displays line to line voltage, current and frequency of second and third Phase
7th Screen	Displays line to line voltage, current and frequency of third and first Phase
8th Screen	Displays average line to line voltage, average current of three phase and frequency

3. Display Descriptions in 1Ø – 2W:

1st Screen	Displays line to neutral voltage, current of phase and frequency.
2nd Screen	Displays Run Hours
3rd Screen	RPM

In Manual Mode:
To scroll through next screen press ⮌ key.

1.Display Descriptions in 3Ø – 4W:

1st Screen	Displays Line to Neutral voltage of all 3 Phase
2nd Screen	Displays Line to Line voltage of all 3 Phase
3rd Screen	RPM
4th Screen	Displays current of all 3 Phase

5th Screen	Displays Run Hours
6th Screen	Displays Line to Neutral voltage, current of first Phase
7th Screen	Displays line to neutral voltage, current of second Phase
8th Screen	Displays line to neutral voltage, current of third Phase
9th Screen	Displays average line to neutral voltage, average current of three phase and frequency.
10th Screen	Displays average line to line voltage, average current of three phases and frequency of present phase.

2. Display Descriptions in 3Ø – 3W:

1st Screen	Displays Line to line voltage of all 3 Phase
2nd Screen	RPM
3rd Screen	Displays Line to line current of all 3 Phase
4th Screen	Displays run hours
5th Screen	Displays Line to line voltage, current and frequency of first and second Phase
6th Screen	Displays line to line voltage, current and frequency of second and third Phase
7th Screen	Displays line to line voltage, current and frequency of third and first Phase
8th Screen	Displays average line to line voltage, average current of three phase and frequency

3. Display Descriptions in 1Ø – 2W:

1st Screen	Displays line to neutral voltage, current of phase and frequency.
2nd Screen	Displays Run Hours
3rd Screen	RPM

Parameter Setting Mode

1. Program Mode — **Function:** To enter into Program Mode.

Press & hold [⟲] key for 4 seconds to enter into Program Mode. When release the key, second display will flash [⟲]. Press UP/DOWN keys to modify the set value and to go to the next parameter by pressing [⟲] key.
Press the [⏎] key to save the set value and to come out of parameter setting after changing the set value.

2. SYS — **Function:** Network selection.

Network selection, 3 Phase 4 wire, 3 Phase 3 wire and 1 Phase 2 wire

Min	Max	Fac.
3P4	1P2	3P4

3. CT.P — **Function:** To select CT Primary ratio.

To select CT Primary ratio.

Min	Max	Fac.
5A	10kA	5A

4. PT.P — **Function:** To select PT Primary ratio.

PT Primary: To select PT Primary ratio.

Min	Max	Fac.
100V	500kV	350V

5. PT.S — **Function:** To select PT Secondary ratio.

PT Secondary: To select PT Secondary ratio.

Min	Max	Fac.
100V	375V	350V

6. no. PoL — **Function:** To select no. of Poles.

To select number of poles.

Min	Max	Fac.
0	98	0

7. rSt rHr — **Function:** To clear run hours.

If selected yes run hours will be cleared.

Min	Max	Fac.
no	YES	no

8. rSt FCt — **Function:** To restore default settings of the controller.

When set to YES all parameters are programmed to factory values.
Useful to debug setting related problems.

Min	Max	Fac.
no	YES	no

Error Messages

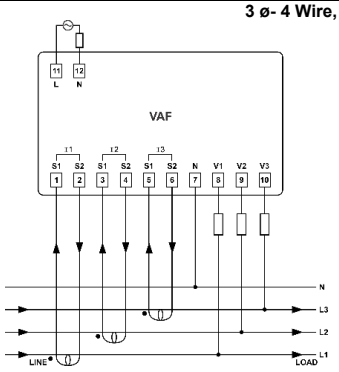
Message	Description
our	It indicates corresponding parameter reach above specified measuring range.

Typical Wiring Diagram

NOTE: # All fuse types: 0.5A class CC UL type; 0.5A fast acting 600V

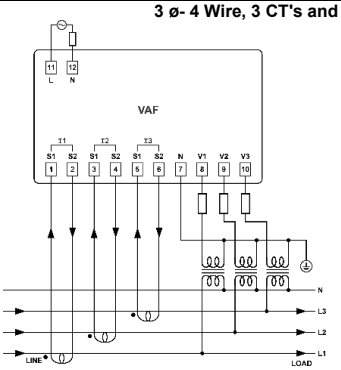
3 Phase - 4 Wire

3 ø- 4 Wire, 3 CT's



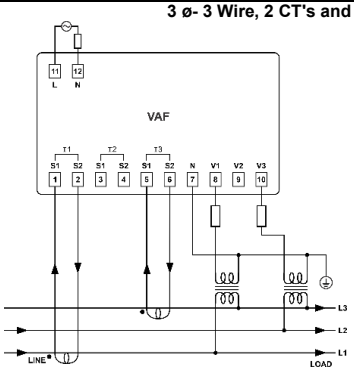
3 Phase - 4 Wire

3 ø- 4 Wire, 3 CT's and 3 PT's



3 Phase - 3 Wire

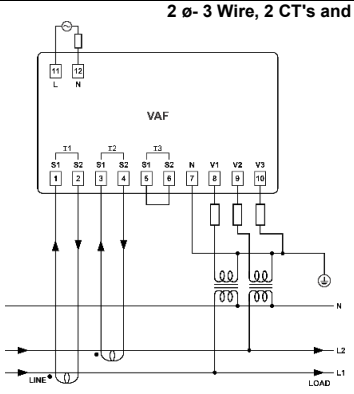
3 ø- 3 Wire, 2 CT's and 2 PT's



Note: Do not use 7,8, 9 & 10 connector for 3P 3W.

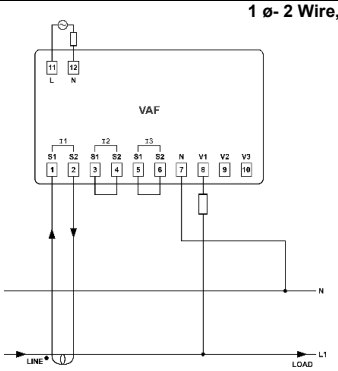
P2 Phase - 3 Wire

2 ø- 3 Wire, 2 CT's and 2 PT's



1 Phase - 2 Wire

1 ø- 2 Wire, 1 CT's



OUR OTHER PRODUCTS

Sub-Zero®
Precision Control, always

Digital Panel Meter
Power Analyzer | Timer
PLC | HMI | Data Logger

REV2 – 11.03.2022