OP3351-V02

selec VAF39A/VAF39A-CE

Operating Instructions



96 x 96

SPECIFICATIONS

DISPLAY
3 rows of 3 digit,
7 segment LED display 0.57 inch digit height

LED INDICATIONS
LED indications for all measuring parameter

WIRING INPUT
3P3W and 3P4W system

RATED INPUT VOLTAGE
11 to 300V AC (L-N); 19 to 600V AC (L-L)
Installation Category II (600V)
Installation Category III (35V-480V)

FREQUENCY RANGE
45-65 Hz

RATED INPUT CURRENT
Nominal 5A (Min-20mA, Max-7.2A)

CT PRIMARY
*1A / 5A to 10,000A (Programmable for any value)
Note: *1A to 10,000A if CT secondary is 1 else
5A to 10,000A

CT SECONDARY
*1A or 5A (Programmable)

PT PRIMARY
100V to *550kV (L-L) (Programmable for any value)

PT SECONDARY
100V to 500V AC (L-L) (Programmable for any value)

DISPLAY UPDATE TIME
1 sec. for all parameters

DISPLAY SCROLLING
Automatic / Manual (Programmable)

POWER CONSUMPTION
Less than 5VA

RPM
Pole: 0 (Range: 0-98, selectable in steps of 2), Frequency: 45-65 Hz

RUN HOUR
0-99999.9 hr

BURDEN
< 0.5VA@5A per phase

RESOLUTION
For current, voltage and power resolution depends on CT and PT setting
For RPM: 0.1, Run Hour: 0.1hr, Power factor: 0.01

ENVIRONMENTAL CONDITIONS
- Indoor use
- Altitude of up to 2000 meters
- Pollution degree II

Temperature : Operating : -10°C to 55°C
Storage : -20°C to 75°C
Humidity : Up to 85% non-condensing

PROTECTION CLASS : II

IP PROTECTION
Front: IP51
Back/Terminal: IP20

MOUNTING : Panel mounting

WEIGHT : 206.5 gm

ORDER CODE INFORMATION

Product	Supply	Certification	
		CE	c UL us LISTED
VAF39A	85 to 276V AC/DC, 50/60Hz	—	—
VAF39A-CE	85 to 276V AC/DC, 50/60Hz	✓	—

Parameters	Description	Unit
Voltage (True RMS)	All phase to phase, phase to neutral and average	V, kV
Current (True RMS)	All phases and average	A, kA
Power (kW, kVAr, kVA)	All phases and average	k, M
Power factor	All phases and average	PF
Frequency	Frequency of present phase	Hz
Run Hour	Time for which load is connected	H : M
RPM	RPM calculated from system frequency	—

ACCURACY

Measurement	Accuracy
Voltage V_{L-N}	±0.5% of F.S. ±2 digit
Voltage V_{L-L}	±0.5% of F.S. ±2 digit
Average Voltage V_{L-N}	±0.5% of F.S. ±2 digit
Average Voltage V_{L-L}	±0.5% of F.S. ±2 digit
Current	±0.5% of F.S. ±2 digit
Average current	±0.5% of F.S. ±2 digit
Power(kW, kVAr, kVA)	1%
Power factor	±0.01
Frequency	±0.1Hz ±1 digit
Run Hour	±1%
RPM	±0.5%

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.

- Do not use the equipment if there is any mechanical damage.
- Ensure that the equipment is supplied with correct voltage.

⚠ CAUTION :

1. Read complete instructions prior to installation and operation of the unit.
2. Risk of electric shock.
3. The equipment in its installed state must not come in close proximity to any heating sources, oils, steam, caustic vapors or other unwanted process by products.

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. Confirm that all connections are correct.
3. Use lugged terminals.
4. To reduce electromagnetic interference use of wires with adequate ratings and twists of the same in equal size shall be made with shortest connections.
5. Layout of connecting cables shall be away from any internal EMI source.
6. Cable used for connection to power source, must have a cross section of 0.5mm^2 to 2.5mm^2 (20 to 14AWG; 75^{0}C (min)). These wires shall have current carrying capacity of 7.2 A.
7. Copper cable should be used (Stranded or Single core cable).
8. Before attempting work on device, ensure absence of voltages using appropriate voltage detection device.

INSTALLATION GUIDELINES

⚠ CAUTION :

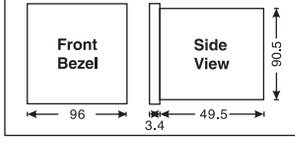
1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to the operator.
4. Before disconnecting the secondary of the external current transformer from the equipment, make sure that the current transformer is short circuited to avoid risk of electrical shock and injury.
5. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
6. The equipment does not have a built-in-type fuse. Installation of external fuse of rating 275V AC / 0.5Amp for electrical circuitry / battery is highly recommended.

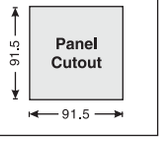
MECHANICAL INSTALLATION

For installing the meter

1. Prepare the panel cutout with proper dimensions as shown below.
2. Push the meter into the panel cutout. Secure the meter in its place by fitting the clamp on the rear side. Fit clamps on both sides in diagonally opposite location for optimum fitting.

Outline Dimensions (in mm)	Panel cutout Dimensions (in mm)

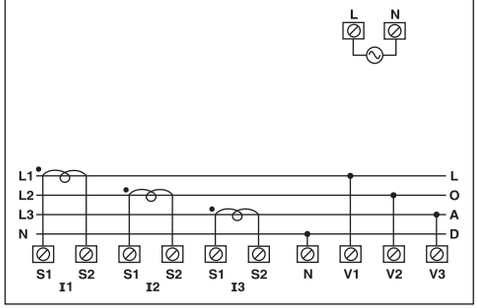




MAINTENANCE

1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
2. Clean the equipment with a clean dry or damp cloth. Do not use any cleaning agent other than water.

TERMINAL CONNECTIONS



FRONT PANEL DESCRIPTION



ONLINE PAGE DESCRIPTION

There are 3 dedicated keys labelled as VAF, A/h, V/r. Use these 3 keys to read meter parameters. Simply press these keys to read the parameters.

KEY PRESS	ONLINE PAGE DESCRIPTION
Press "VAF" (For 3P4W)	**For 3P4W system :** **The 1st screen :** Displays line to neutral voltage, current, frequency of first phase. **The 2nd screen :** Displays line to neutral voltage, current, frequency of second phase. **The 3rd screen :** Displays line to neutral voltage, current, frequency of third phase. **The 4th screen :** Displays average line to neutral voltage, average current of three phases and frequency. **The 5th screen** : Displays average line to line voltage, average current of three phases and frequency. **The 6th screen** : Display active, reactive and apperant power of first phase. **The 7th screen** : Display active, reactive and apperant power of second phase. **The 8th screen** : Display active, reactive and apperant power of third phase. **The 9th screen** : Display Average active, reactive, apperant power. **The 10th screen** : Display Power factor of three phase. **The 11th screen** : Display Avg power factor.

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KEY PRESS	ONLINE PAGE DESCRIPTION
Press "VAF" (For 3P3W)	**The 1st screen :** Displays line to line voltage, current, frequency of first phase. **The 2nd Screen :** Displays line to line voltage, current, frequency of second phase. **The 3rd Screen :** Displays line to line voltage, current, frequency of third phase. **The 4th Screen :** Displays average line to line voltage, average current of three phases and frequency. **The 5th Screen :** Displays average active, reactive and apperant power. **The 6th Screen :** Displays average power factor.
Press "A / h"	**The first screen :** Displays phase current of three phases.
Press "A / h" for 3sec.	Displays Run Hour (for non zero poles) **Note :** To return back to current page, press "**A / h**" for 3 sec.
Press "V / r"	**The first screen** : Displays line to neutral voltage of three phases. **The second screen** : Displays line to line voltage of three phases. **Note :** For 3 phase 3 wire system, only the second screen will be available.
Press "V / r" for 3sec.	Displays RPM (for non zero poles) **Note :** To return back to voltage page, press "**V / r**" for 3 sec.

AUTOMATIC / MANUAL MODE DESCRIPTION

Press ✔ button for 5 sec. to toggle between Automatic and 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 when any key is pressed, unit temporarily switches to manual mode and the appropriate page is displayed, also if no key is pressed for 5 sec., unit resumes automatic mode.

SERIAL NUMBER DESCRIPTION

Press ✔ and ⮟ key for 10 sec. to display 9 digit serial number for 5 sec.

*CONFIGURATION

There are 3 dedicated keys marked as ✔, ⮟, ⮝.

Note: The settings should be done by a professional, after going through this users manual and after having understood the application situation.

For the configuration setting mode :

- Use ⮟+⮝ these 2 keys for 3 sec. to enter & exit from configuration menu.
- Press ⮝ key to go to next page.
- Press ⮟ key to go to previouse page.
- Press ✔ key for once, to enter edit mode & save the parameters.
- Press ⮝ key to increment parameter value.
- Press ⮟ key to shift the cursor for the next digit.
- Press ✔ key for 5 sec. to set CT/PT primary values in kilo from normal and vice versa.

Eg:- If user want to set 1300 = first Set digit 001 then hold key ✔ for 5 sec. to shift in k, then display will show 1.00kV, press ⮟ shift to cursor for next digit. Next press ⮝ key to change values after the decimal point 1.3kV and then press ✔ key for once, to save the parameters, it will show 1.30kV.

CONFIGURATION

There are 3 dedicated keys marked as ✔, ⮟, ⮝. Use these 3 keys to enter into configuration menu / change setting.

Note : The settings should be done by a professional, after going through this users manual and after having understood the application situation.

For the configuration setting mode :

- Press ⮟+⮝ key for 3 sec. to enter or exit from the Configuration menu.
- Press ⮟ or ⮝ key to scroll through the setting pages.
- Press ✔+⮟ or ✔+⮝ Keys to decrement or Increment (change) the parameter setting.

Config. page	Function	Range or Selection	Factory Setting
1	Network Selection	3P3W and 3P4W	3P4W
2	CT primary	*1A / 5A to 10.0kA	5A
3	CT secondary	*1A or 5A	5A
4	PT primary	100V to *550kV	350V
5	PT secondary	100V to 500V	350V
6	No. of Poles	0 - 98	0
7	Reset Run Hour	Yes / No	No

NOTE

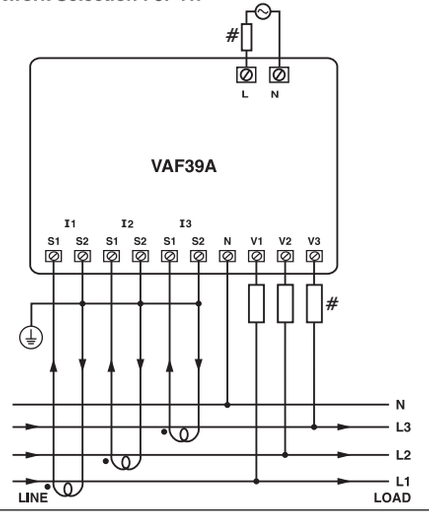
- The CT secondary current has been changed from a fixed 5A to programmable 1A or 5A.
- The PT primary rating has been upgraded from 500kV to 550kV.

** Indicates features are only present in the Software Version No. 2.00 and above.*

TYPICAL WIRING DIAGRAM

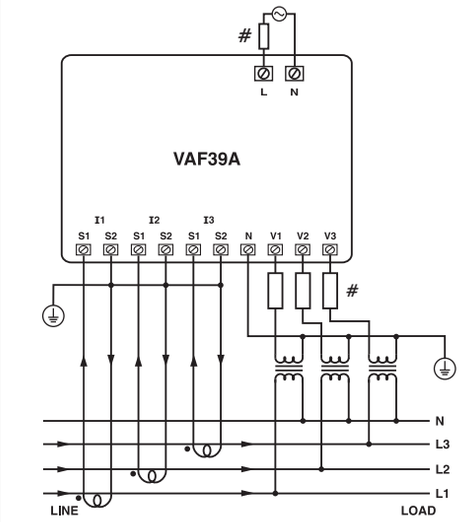
3 Phase-4 Wire(Commonly Used) | 3 CT's

Network Selection : 3P4W



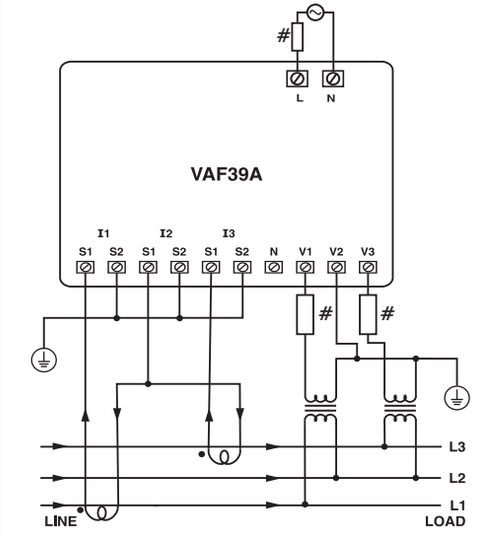
3 Phase - 4 Wire | 3 CT's and 3 PT's

Network Selection : 3P4W



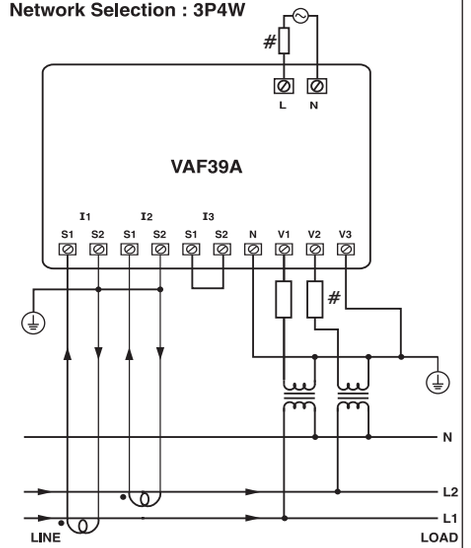
3 Phase - 3 Wire | 2 CT's and 2 PT's

Network Selection : 3P3W



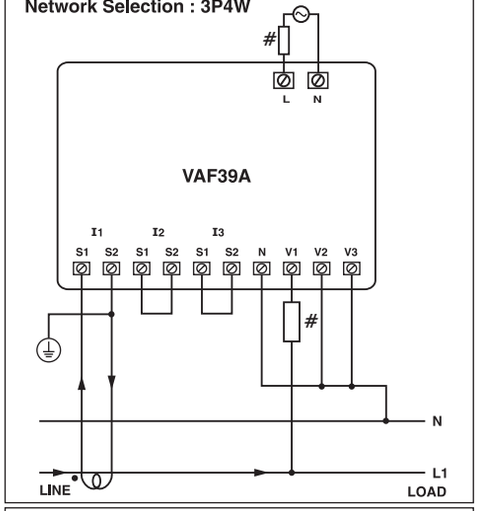
2 Phase - 3 Wire | 2 CT's 2 PT's

Network Selection : 3P4W



1 Phase - 2 Wire | 1 CT

Network Selection : 3P4W



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

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

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