

USER'S GUIDE

LEONICS®

Wise33

WiseMP33

ZERO CURRENT/ VOLTAGE CROSSING
AUTOMATIC VOLTAGE STABILIZER

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GETTING STARTED

Please read carefully and follow this LEONICS Wise33 / Wise MP33 series AVR guide.

Important: Please keep this user's guide for reference in order to use the LEONICS AVR properly and safety. This user's guide contains instructions for installation, operation, display, setting and troubleshooting.

If there are any symptoms of problems which are not mentioned in this guide or an queries, please contact your Leonics local distributors, Leonics Service Center, send e-mail to support@leonics.com or visit www.leonics.com.

For your convenience and quick reference for our service, please fill the requested information in the blanks below.

Wise33 / Wise MP33 series model : _____

Serial number : _____

Purchased date : _____

Purchased from : _____

SAFETY INSTRUCTIONS

CAUTION

DO NOT remove Wise33 / Wise MP33 series AVR cover for repairing by yourself. Complicated electronic devices inside the AVR may be damaged or caused hazard to life. Repairing is only referred to technician.

1.1 Safety instruction about electricity

- 1.1.1 Do not work alone under dangerous condition.
- 1.1.2 Short circuit current via conductor may cause seriously skin burned.
- 1.1.3 Wiring permanent electrical connectors must be done by the licensed technicians.
- 1.1.4 Wire, connectors and power supply must be in good condition at all time.
- 1.1.5 To reduce risk from electric shock when you could not check building electric ground system, turn off the breakers of all equipment before connect them to Wise33 / Wise MP33 series AVR.
- 1.1.6 DO NOT touch any metal connections and parts of the equipments when they are connecting to the AVR.
- 1.1.7 To connect and disconnect the cable from equipment to equipment, use only one hand. This is to prevent electric shock from contact of 2 different electric potential equipments with earth system.

1.2 Safety instruction to install the Wise33 / Wise MP33 series AVR

- 1.2.1 Install the AVR in dry place with good ventilation, no fume, no chemical dust, no inflammable substances, and no liquid. Avoid the place near radio transceiver, thermal expansion devices. Do not place it direct to sunlight.
- 1.2.2 The Wise33 / Wise MP33 series AVR has ventilation grills at its sides and behind. Make sure that nothing blocks the ventilation grills.

- 1.2.3 Turn off the breaker before connect any cables to the computer.
- 1.2.4 To prevent surge, always turn on the Wise33 / Wise MP33 series AVR before turn on the equipments.
- 1.2.5 Connect the wires to the terminals of Wise33 / Wise MP33 series AVR as mentioned on the behind to prevent the damages.
- 1.2.6 To connect the Wise33 / Wise MP33 series AVR to AC source, it is recommended to connect through MDB (Main Distribution Board).
- 1.2.7 During heavy rain and storm, it is recommended to stop using any equipment including the Wise33 / Wise MP33 series AVR to prevent them from lightning through AC Line.

INTRODUCTION

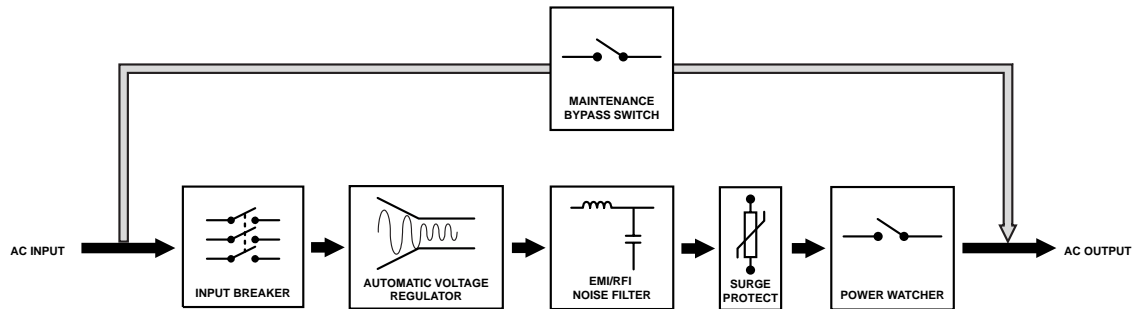
2.1 General

Wise33 / Wise MP33 series AVR, a 3-phase automatic voltage regulator or stabilizer, is compatible with both star and delta circuit connections. With 8/16 bit microprocessor controlled, Wise33 / Wise MP33 series AVR supplies pure sine wave output with low harmonic distortion at high accuracy and efficiency. Wise33 / Wise MP33 series AVR comes with built-in surge protector and audible alarm to alarm when the AVR has faults. Furthermore, it has LED display and LCD screen to display operating status and electrical data.

2.2 Features

- 3 phase voltage regulator with 8/16 bit microprocessor controlled
- Pure sine wave output
- Zero voltage and zero current crossing
- 4 taps change
- EMI/RFI and power line noise protection
- Surge protector
- Automatic shut down when extremely high voltage, extremely low voltage, overload and unbalance phase
- Easy to install
- LED and digital volt-amp meter on LCD display
- Volt meter and Amp meter

2.3 Principle



Normal operation mode: Wise33 / Wise MP33 series AVR takes power from main electricity supply. Then, the current flows to automatic voltage regulator (AVR) circuit to regulate the voltage level. If the voltage is too high or too low, the AVR circuit will regulate it to the level that is safe for the loads. Then, flows to EMI/RFI noise filter circuit and check load level at Power watcher to protect overload. If the AVR is overloaded, it will alarm. You have to disconnect some loads. If the AVR is under these situations; output over/under voltage, overload, input frequency fault, over temperature, and etc., it will shut itself down and restart automatically when it returns to normal (for autotomatic restart mode only).

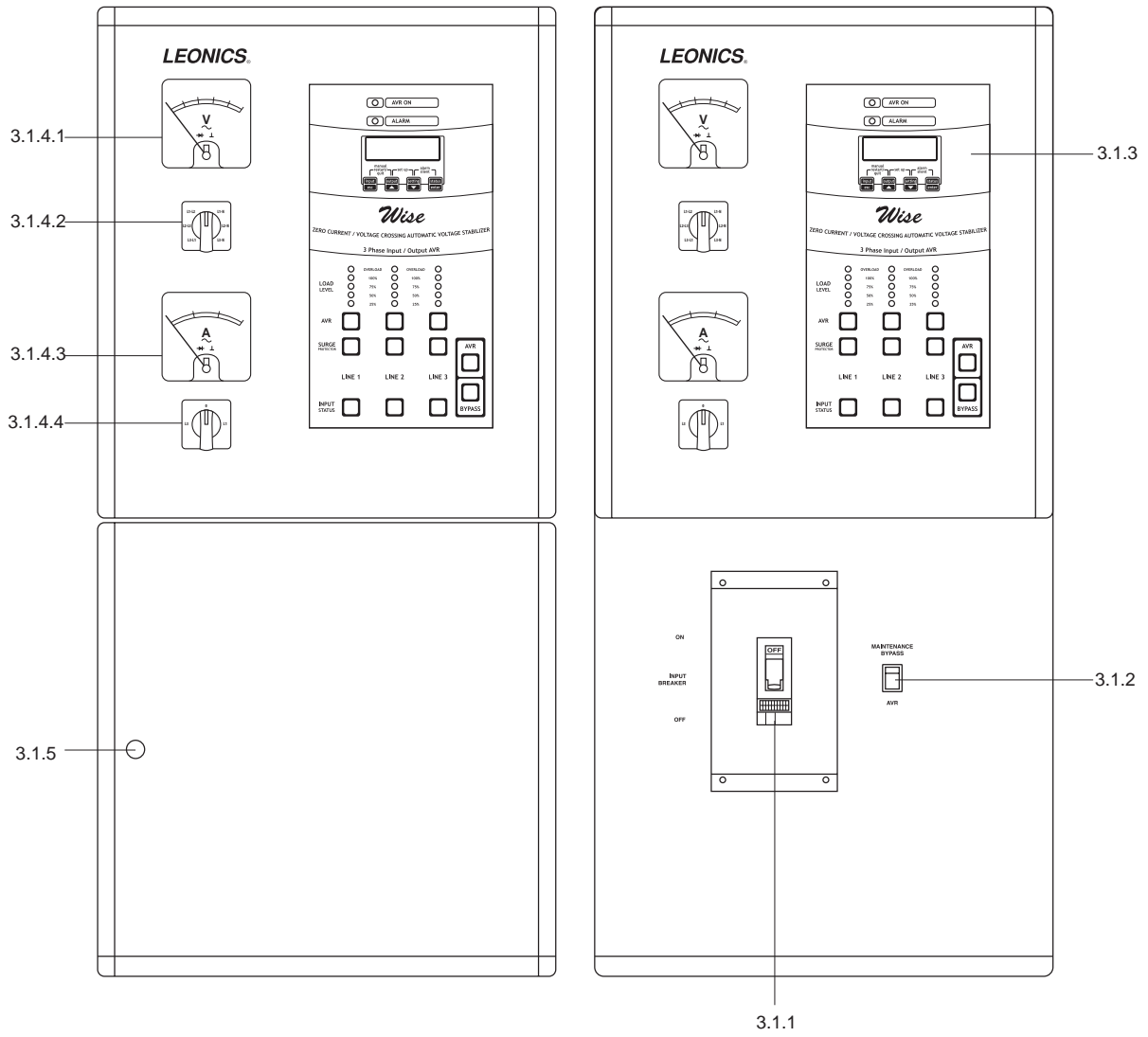
Maintenance bypass mode When the Maintenance bypass switch is ON, the loads are taking power directly from main electricity supply. To stop the AVR and disconnect it from main electricity supply for maintenance, turn off the input breaker.

Note: There are 2 restart modes (automatic and manual restart). After the AVR shuts down and the restart mode is manual, once it detects no more faults, it will alarm. You can restart the AVR by pressing

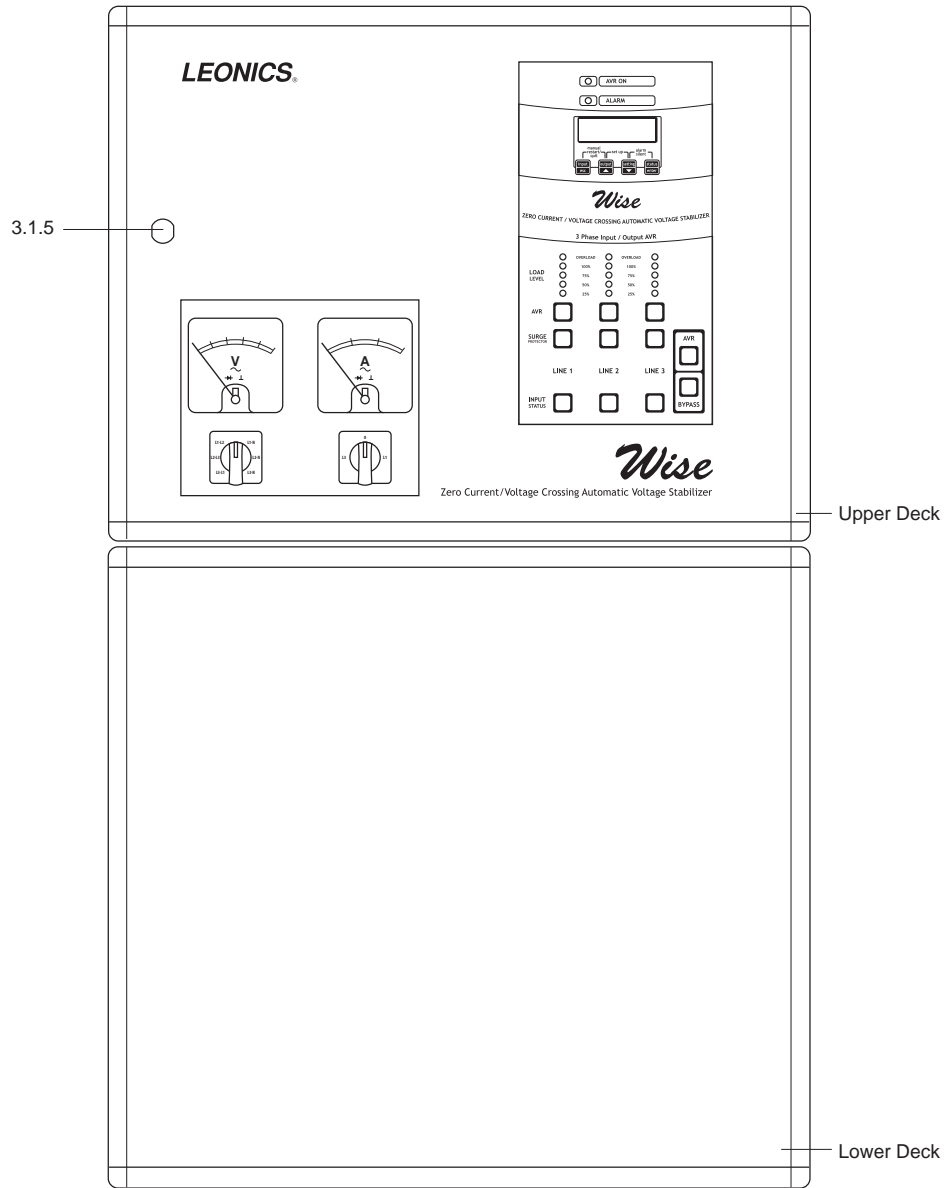


FRONT AND REAR PANELS

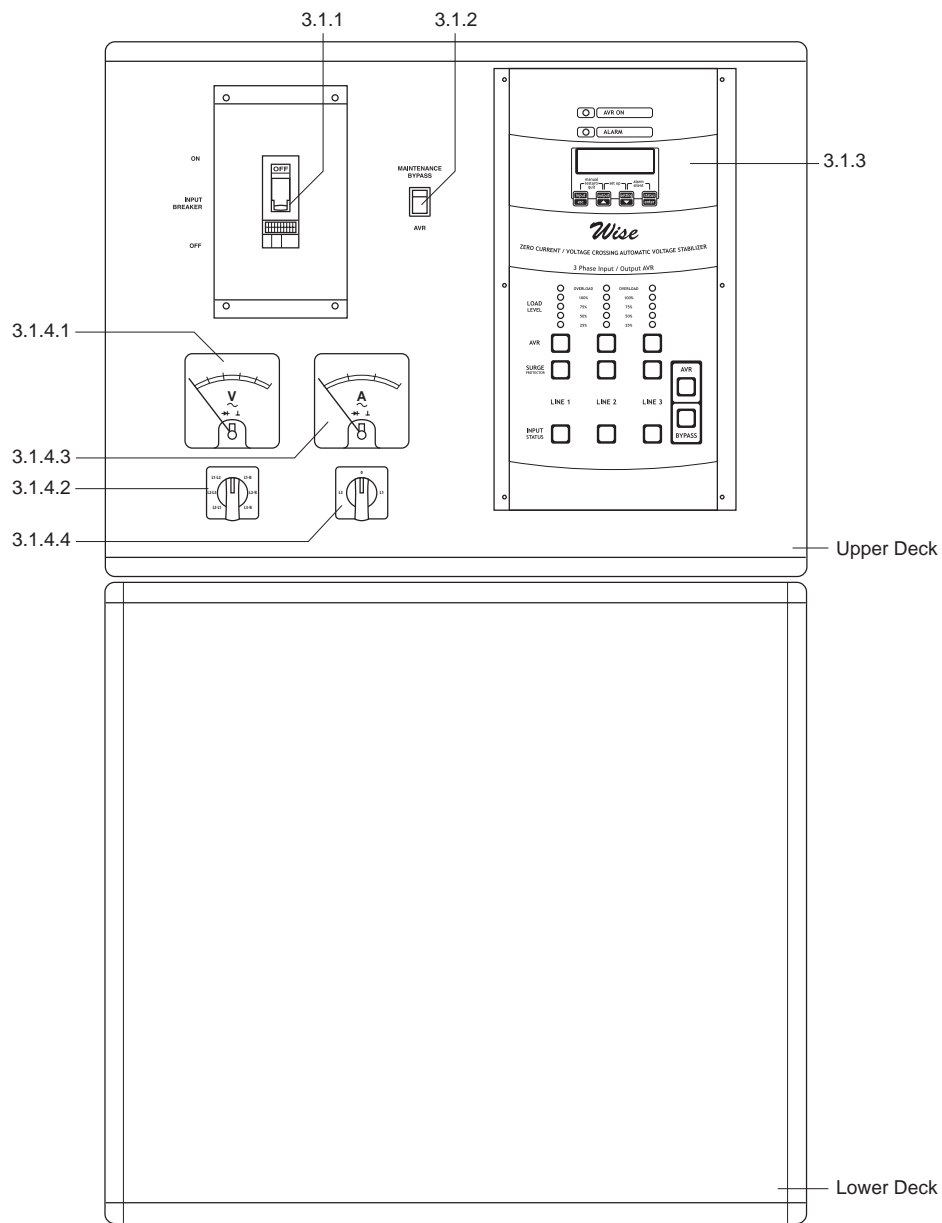
3.1 Front panel



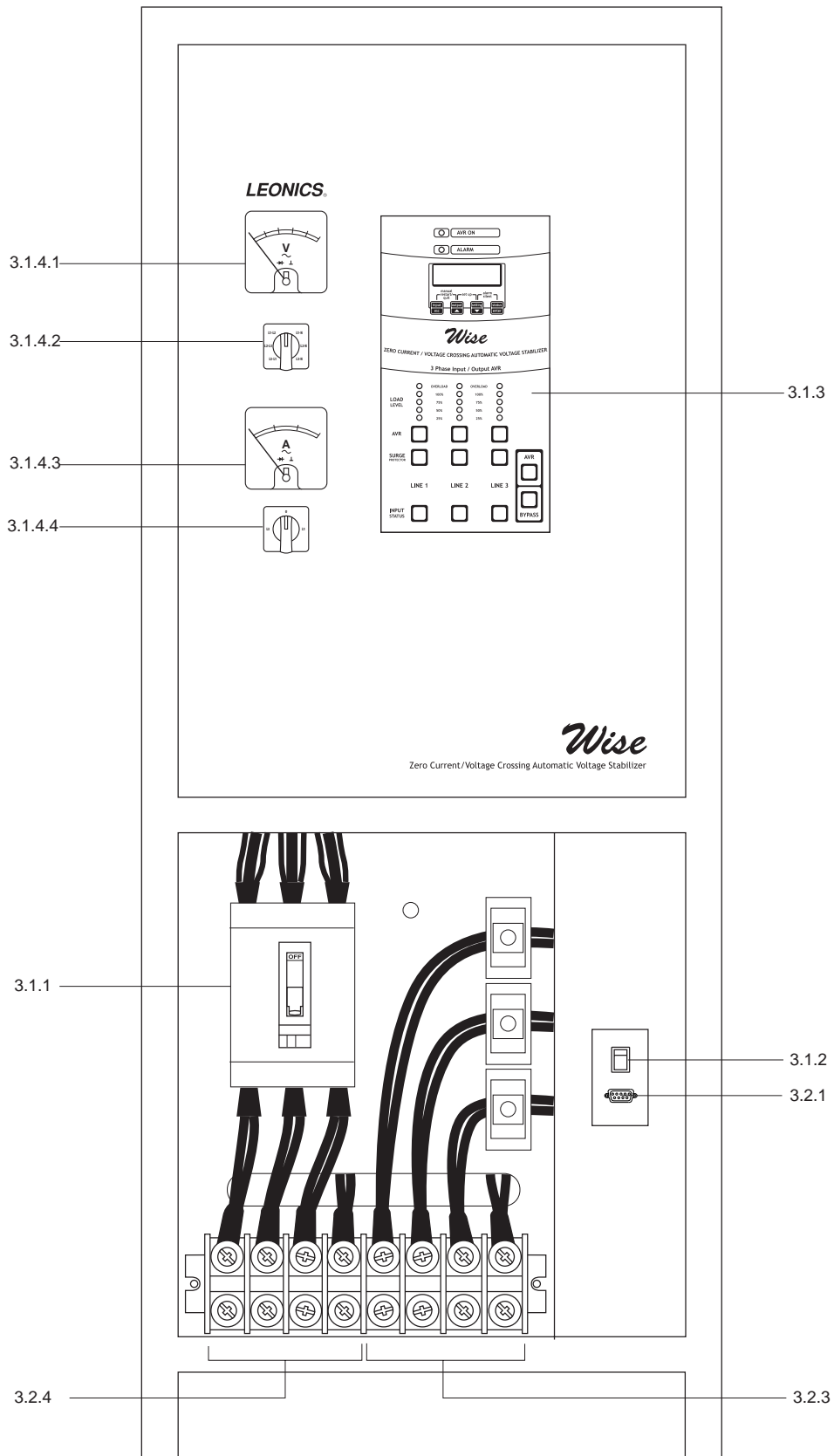
Wise33 / Wise MP33 series AVR type A



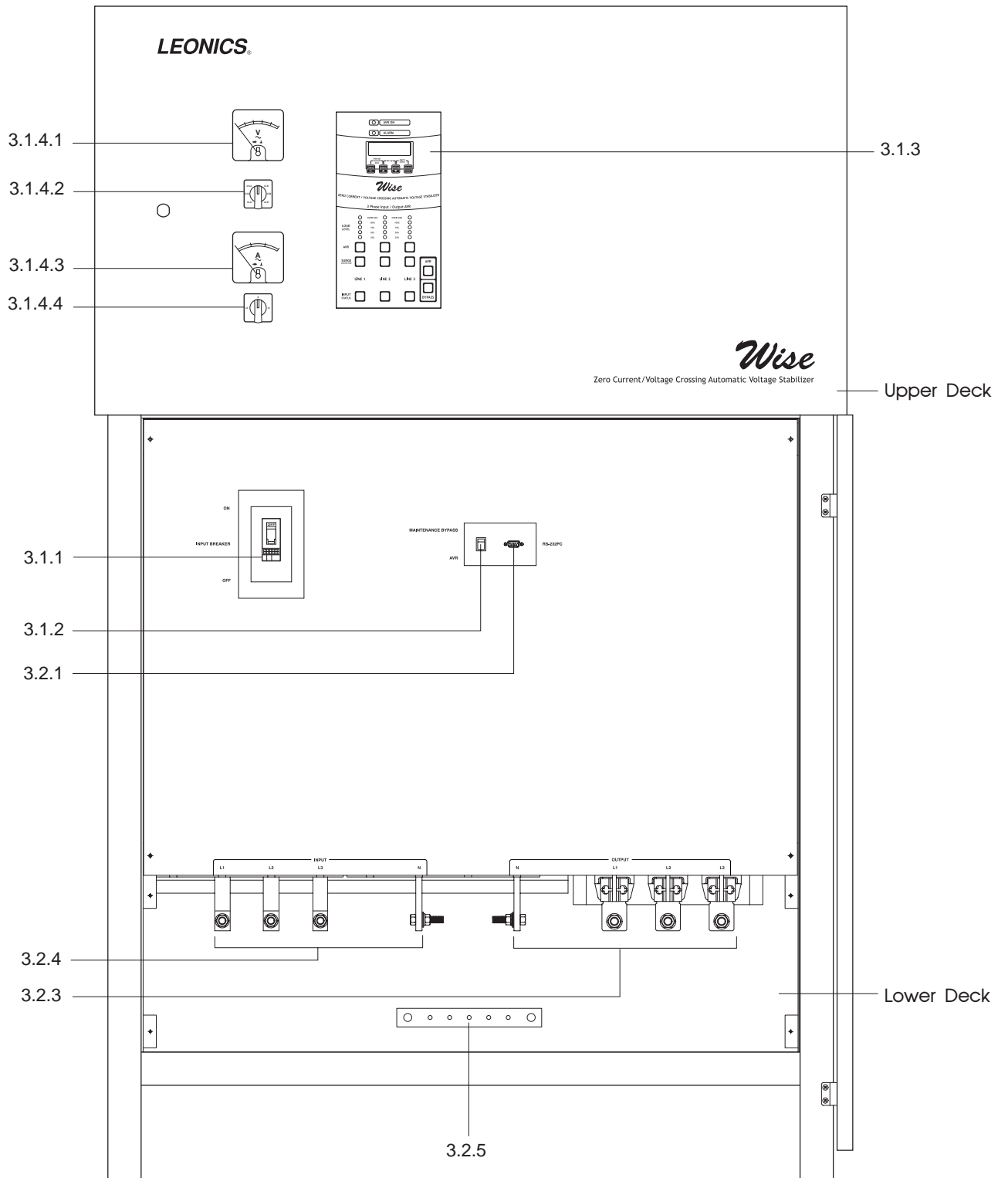
Wise33 / Wise MP33 series AVR type B



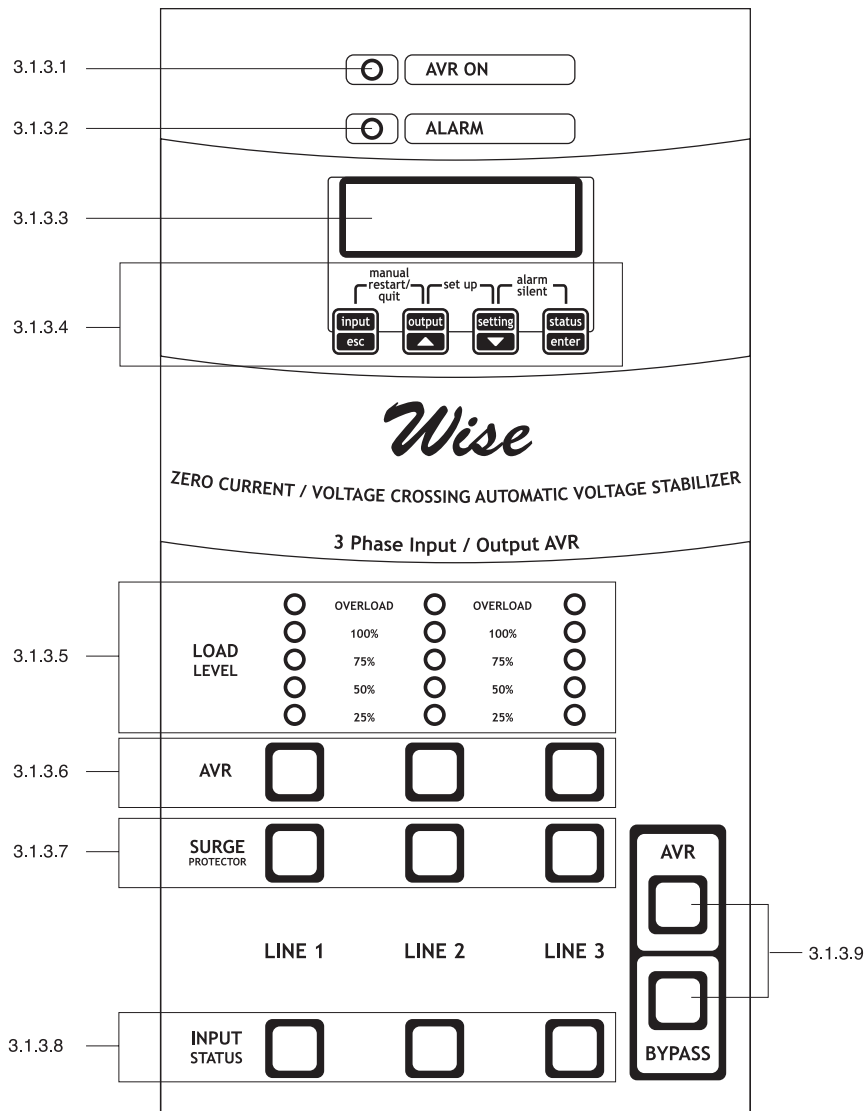
Wise33 / Wise MP33 series AVR type B
(when open the upper door)



Wise33 / Wise MP33 series AVR type C



Wise33 / Wise MP33 series AVR type D
(when open the lower door)



- 3.1.1 **INPUT BREAKER:** The breaker to turn on and turn off the Wise33 / Wise MP33 series AVR
- 3.1.2 **MAINTENANCE BYPASS/AVR SWITCH:** The selector switch to select operating mode; maintenance bypass mode or automatic voltage regulator mode.
- 3.1.3 **DISPLAY:**
 - 3.1.3.1 **AVR ON:** The lamp shows that the AVR is operating under AVR mode.
 - 3.1.3.2 **ALARM:** The lamp shows that the AVR has faults.
 - 3.1.3.3 **LCD SCREEN:** The screen displays electrical data such as voltage, current, frequency and the percentage of AVR capacity taken by loads, and etc.
 - 3.1.3.4 **CONTROL BUTTONS:** The buttons to select display, change setting and control the AVR operation. See more information in Section DATA DISPLAY and SETTING.
 - 3.1.3.5 **LOAD LEVEL:** The lamps show how much power is being taken by the loads in each phase in percentage.
 - 3.1.3.6 **AVR:** The lamps show that the AVR is operating under AVR mode. Each lamp represents each phase.
 - 3.1.3.7 **SURGE PROTECTOR:** Each lamp shows the operating status of surge protector system in each phase.

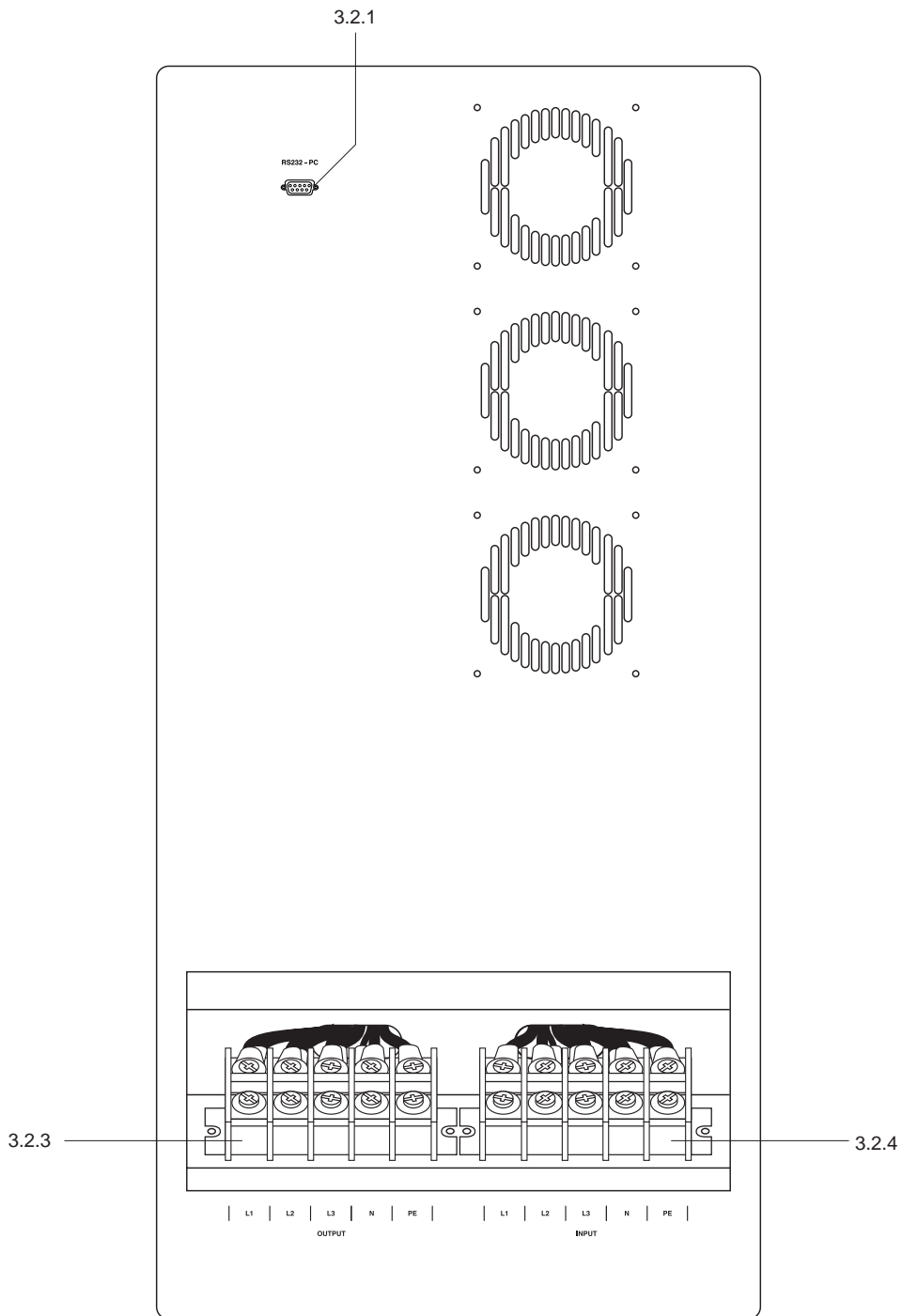
- 3.1.3.8 INPUT STATUS: Each lamp shows the status of input voltage in each phase.
- 3.1.3.9 AVR/BYPASS: The lamps show that the AVR is operating under automatic voltage regulator mode or maintenance bypass mode (that means the loads are taking the power directly from main electricity supply).
- 3.1.4 VOLTMETER AND AMP METER:
 - 3.1.4.1 Volt meter
 - 3.1.4.2 Selector switch to select the display of Line-Neutral voltage value of each phase, or Line-Line voltage value.
 - 3.1.4.3 Amp meter
 - 3.1.4.4 Selector switch to select the display of current value of each phase.
- 3.1.5 Door

Relationship between indicator lamps and AVR operation

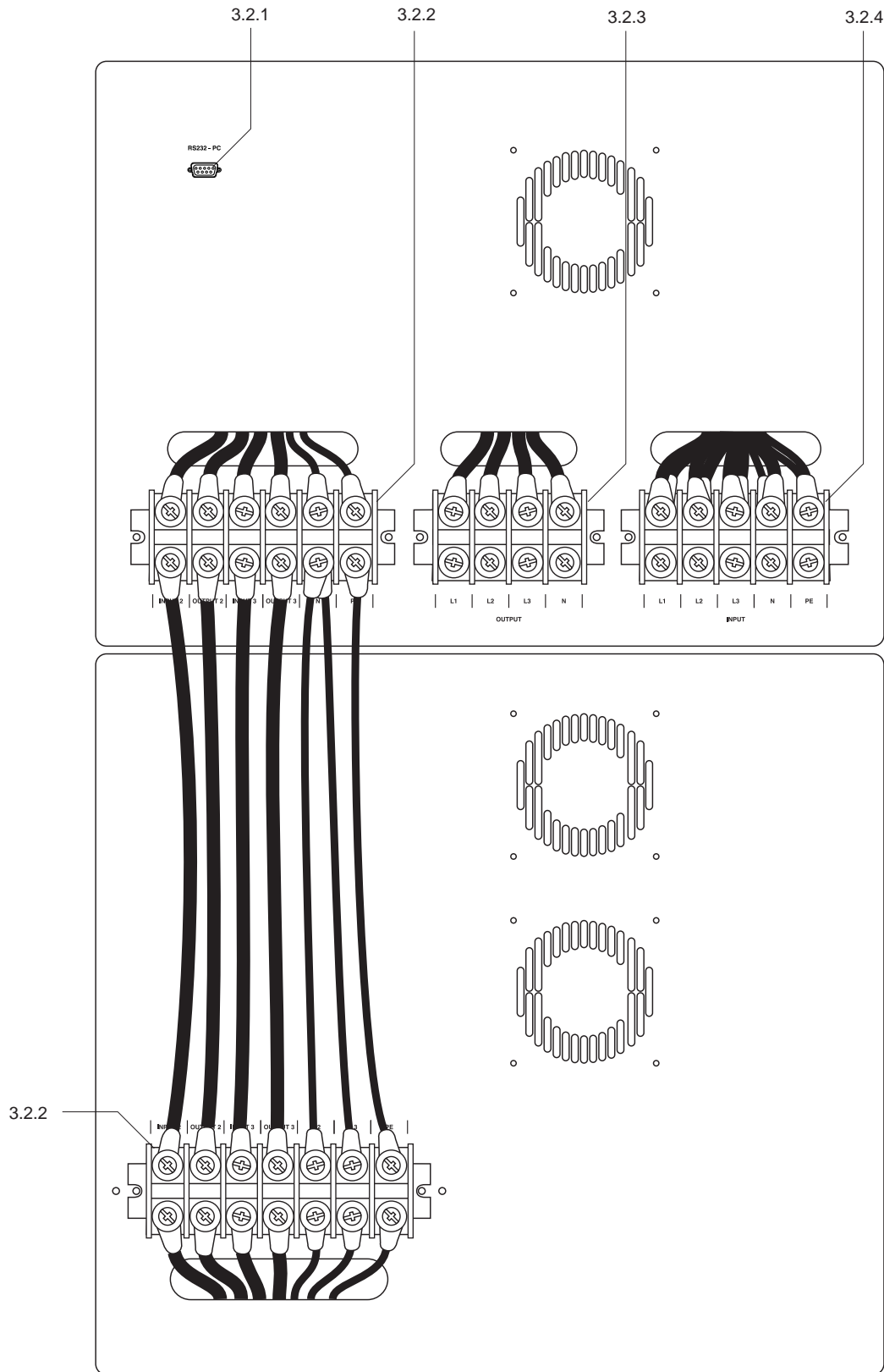
Indicator lamp	Status of indicator lamps and AVR operation		
	OFF	BLINK	BRIGHT
AVR ON (green)	The AVR is OFF.	-	The AVR is operating under AVR mode.
ALARM (red)	The AVR is operating properly.	There is fault.	The voltage from main electricity supply is low or there is fault.

3.2 Inside / Rear panel

- 3.2.1 RS-232 PC: The port to connect signal to computer.
- 3.2.2 CONNECT TERMINAL: The terminal for connecting the upper deck to lower deck (Type B only).
- 3.2.3 OUTPUT TERMINAL: The terminal for connecting the wires from the equipment or loads.
- 3.2.4 INPUT TERMINAL: The terminal for connecting the wires from main electricity supply to the AVR.
- 3.2.5 PE: The connecting point to ground system.



Wise33 / Wise MP33 series AVR type A



Wise33 / Wise MP33 series AVR type B

INSTALLATION AND OPERATION

4.1 Installation

Installation of the Wise33 / Wise MP33 series AVR must be done by professional technicians only. Before installation, please read this user's guide carefully.

4.1.1 Transportation

You can move the Wise33 / Wise MP33 series AVR by forklift truck. In case that you have to lift it, please consider

4.1.1.1 The AVR must be lifted upright at all time. Do not tilt.

4.1.1.2 Do not unpack the packaging until it reaches the installation site to protect the damages during transportation.

4.1.2 Wire sizing

4.1.2.1 For safety and neatness, it is recommended to wire all wires in the conduit.

4.1.2.2 The wire size recommended in the table below is TIS no. 11-2531 PVC insulated copper wire with conductor temperature 70 degree Celsius, 700 Volts, ambient temperature 40 degree Celsius and maximum 3 wires wiring in the same conduit.

Rating	10kVA	15kVA	24kVA	30kVA	45kVA	60kVA	75kVA	90kVA	120kVA	150kVA	180kVA	210kVA	240kVA
Input wire (mm ²)	4	6	10	16	25	35	50	2 x 35	2 x 50	2 x 50	3 x 70	3 x 70	3 x 70
Output wire (mm ²)	4	6	10	16	25	35	50	2 x 35	2 x 50	2 x 50	2 x 70	3 x 70	3 x 70
Connect wire (mm ²)	-	-	-	-	25	35	50	-	-	-	-	-	-
Earth wire (mm ²)	2.5 to 4	4	4 to 6	6	10	10	16	25	25	35	35	35	35

Note: The maximum length of the wires mentioned above is 5 meters. If you need to wire longer than 5 meters, the wire size must be increased. Contact us if you need assistance.

4.1.3 Wire the upper and lower decks (Type B only).

4.1.3.1 Wire PE (Earth) terminal of the upper deck to PE (Earth) terminal of the lower deck.

4.1.3.2 Wire N2 and N3 (Neutral) terminals of the lower deck to N of the CONNECT TERMINAL of the upper deck.

4.1.3.3 Wire INPUT2 terminal of the lower deck to INPUT2 terminal of the upper deck.

4.1.3.4 Wire OUTPUT2 terminal of the lower deck to OUTPUT2 terminal of the upper deck.

4.1.3.5 Wire INPUT3 terminal of the lower deck to INPUT3 terminal of the upper deck.

4.1.3.6 Wire OUTPUT3 terminal of the lower deck to OUTPUT3 terminal of the upper deck.

4.1.4 Connect the OUTPUT terminal of the Wise33 / Wise MP33 series AVR to the loads as following:

N terminal connects to Neutral.

L1 terminal connects to R-phase or Line1 from loads.

L2 terminal connects to S-phase or Line2 from loads.

L3 terminal connects to T-phase or Line3 from loads.

4.1.5 Connect the INPUT terminal of the Wise33 / Wise MP33 series AVR to main electricity supply as following:

PE terminal connects to Ground (Earth).

N terminal connects to Neutral.

L1 terminal connects to R-phase or Line1 of main electricity supply.

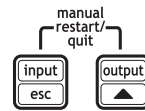
L2 terminal connects to S-phase or Line2 of main electricity supply.

L3 terminal connects to T-phase or Line3 of main electricity supply.

Caution: Before connecting INPUT terminal of the Wise33 / Wise MP33 series AVR to main electricity supply, turn off the breaker at MDB (Main Distribution Board) first.

4.2 Turn on the Wise33 / Wise MP33 series AVR

- 4.2.1 Turn off all loads that are connecting to the AVR.
- 4.2.2 Turn on the breaker at MDB, then INPUT STATUS lamp lights.
- 4.2.3 Open the door and press MAINTENANCE BYPASS/AVR SWITCH to AVR position.
- 4.2.4 Turn on the INPUT BREAKER and close the door.
- 4.2.5 If you select manual restart mode, you will hear the audible alarm. Press simultaneously once.
- 4.2.6 Turn on the loads.







4.3 Turn off the AVR

- 4.3.1 Turn off the loads.
 - 4.3.2 Open the door.
 - 4.3.3 Turn off the INPUT BREAKER and close the door.
- Note:** INPUT STATUS lamp lights due to the AVR is connecting to main electricity supply.

4.4 Operation when the AVR has faults (Maintenance bypass)


- 4.4.1 Turn off the loads.
- 4.4.2 Open the door and turn off INPUT BREAKER.
- 4.4.3 Press MAINTENANCE BYPASS/AVR SWITCH to MAINTENANCE BYPASS position, and then close the door.
- 4.4.4 Turn on the loads. They are now taking power directly from main electricity supply.

DATA DISPLAY

You can check electrical data by pressing , ,  and .

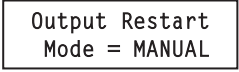
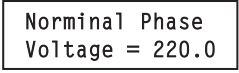
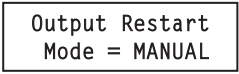
5.1  is to display input electrical data such as input voltage and frequency.

Press once	Shows input voltage of each phase (Line-Neutral).	<table border="1"><tr><td>IN</td><td>L1</td><td>L2</td><td>L3</td></tr><tr><td>V</td><td>220</td><td>220</td><td>220</td></tr></table>	IN	L1	L2	L3	V	220	220	220
IN	L1	L2	L3							
V	220	220	220							
Press twice	Shows input voltage of each phase (Line-Line).	<table border="1"><tr><td>L1-2</td><td>L2-3</td><td>L3-1</td></tr><tr><td>V</td><td>380</td><td>380</td><td>380</td></tr></table>	L1-2	L2-3	L3-1	V	380	380	380	
L1-2	L2-3	L3-1								
V	380	380	380							
Press 3 times	Shows frequency of each phase.	<table border="1"><tr><td>FREQ(1 2 3)(Hz)</td></tr><tr><td>50.0 50.0 50.0</td></tr></table>	FREQ(1 2 3)(Hz)	50.0 50.0 50.0						
FREQ(1 2 3)(Hz)										
50.0 50.0 50.0										
Press 4 times	Returns to the first screen.	<table border="1"><tr><td>IN</td><td>L1</td><td>L2</td><td>L3</td></tr><tr><td>V</td><td>220</td><td>220</td><td>220</td></tr></table>	IN	L1	L2	L3	V	220	220	220
IN	L1	L2	L3							
V	220	220	220							


5.2  is to display output electrical data such as output voltage, output frequency and load percentage.


Press once	Shows output voltage of each phase (Line-Neutral).	<table border="1"><tr><td>OP</td><td>L1</td><td>L2</td><td>L3</td></tr><tr><td>V</td><td>220</td><td>220</td><td>220</td></tr></table>	OP	L1	L2	L3	V	220	220	220
OP	L1	L2	L3							
V	220	220	220							
Press twice	Shows output voltage of each phase (Line-Line).	<table border="1"><tr><td>O</td><td>L1-2</td><td>L2-3</td><td>L3-1</td></tr><tr><td>V</td><td>380</td><td>380</td><td>380</td></tr></table>	O	L1-2	L2-3	L3-1	V	380	380	380
O	L1-2	L2-3	L3-1							
V	380	380	380							
Press 3 times	Shows output current of each phase (Line-Neutral).	<table border="1"><tr><td>OP</td><td>L1</td><td>L2</td><td>L3</td></tr><tr><td>A</td><td>15</td><td>17</td><td>16</td></tr></table>	OP	L1	L2	L3	A	15	17	16
OP	L1	L2	L3							
A	15	17	16							
Press 4 times	Shows load percentage of each phase.	<table border="1"><tr><td>LOAD</td><td>L1</td><td>L2</td><td>L3</td></tr><tr><td>%</td><td>10</td><td>12</td><td>11</td></tr></table>	LOAD	L1	L2	L3	%	10	12	11
LOAD	L1	L2	L3							
%	10	12	11							
Press 5 times	Returns to the first screen.	<table border="1"><tr><td>OP</td><td>L1</td><td>L2</td><td>L3</td></tr><tr><td>V</td><td>220</td><td>220</td><td>220</td></tr></table>	OP	L1	L2	L3	V	220	220	220
OP	L1	L2	L3							
V	220	220	220							

5.3  is to display nominal phase voltage and output restart mode.

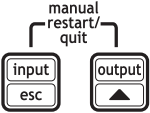
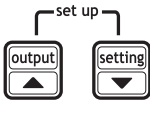
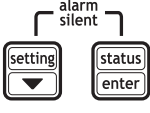
Press once	Shows output restart mode.	
Press twice	Shows nominal phase voltage.	
Press 3 times	Returns to the first screen.	

5.4  is to display system status such as operating status.



Press once	Shows present operating status.	
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Note: When you hear the audible alarm, you can press  until you notice the fault shown on the LCD. Press this button until the display returns to the first screen. See more information in Section TROUBLESHOOTING.



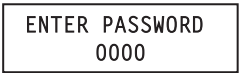



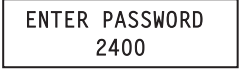

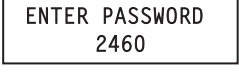

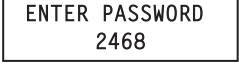





5.5 Press 2 buttons simultaneously

	Press to start the AVR (for manual restart mode only) or return to main menu during setting.
	Press to access password input screen.
	Press to mute the alarm.


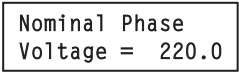











SETTING

To return to main menu, press   simultaneously once or wait for 30 seconds.

6.1 Input password to access to setting menu



- 6.1.1 Press   simultaneously once to enter password input screen. 
 (The password of the following sample is 2468.)
- 6.1.2 Press  twice to input the first digit of the password. 
 (Refer to the above sample, it is 2.)
- 6.1.3 Press  4 times to input the second digit of the password. 
 (Refer to the above sample, it is 4.)
- 6.1.4 Press  6 times to input the third digit of the password. 
 (Refer to the above sample, it is 6.)
- 6.1.5 Press  8 times to input the last digit of the password. 
 (Refer to the above sample, it is 8.)
- 6.1.6 Press   simultaneously once to confirm password entry. 
- 6.1.7 Now, you reach main setting menu. Press   to select setting item.

6.2 System control setting

- 6.2.1 Press  once to enter system control setting screen. This screen displays the value of the nominal phase voltage of each Phase-Neutral. 
- 6.2.2 Press  once to edit the nominal voltage. The voltage value blinks.
- Note: Press  or  to change the voltage value. Then press  to confirm the new setting or press  to cancel the change and return to main menu.
- 6.2.3 Press  once to enter restart mode setting screen. 
- Note: Press  or  to change the restart mode. Then press  to confirm the new setting or press  to cancel the change and return to main menu.

6.3 Alarm Mute


If there are any faults, the AVR will display fault message on the LCD and alarm. You can mute the alarm

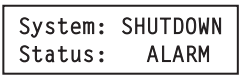

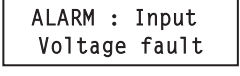
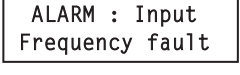
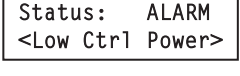

by pressing   simultaneously once.
alarm silent





Note: For Technical Setup Require Key setting, it is for technician only.

TROUBLESHOOTING

If the Wise33 / Wise MP33 series AVR does not operate properly and you cannot solve the problems using this troubleshooting information in this user's guide, please contact your Leonics local distributors, Leonics Service Center, send e-mail to support@leonics.com or visit www.leonics.com.

You can access the screen to view the fault by pressing  until you notice the fault shown on the LCD. Press this button until the display returns to the first screen.

Item	Message on the LCD screen	Causes	Solutions
7.1		The AVR shuts itself down due to fault.	Find out the cause and solve. The AVR will restart automatically when it returns to normal (for automatic restart mode only).
7.2		The output voltage is fault.	Turn off the AVR and check the wiring at the behind whether it is correct. Turn on the AVR again. The AVR will restart automatically when it returns to normal.
7.3		The input voltage is fault.	Turn off the AVR and check the wiring at the behind whether it is correct. Turn on the AVR again. The AVR will restart automatically when it returns to normal.
7.4		The input frequency is fault.	Turn off the AVR and check the wiring at the behind whether it is correct. Turn on the AVR again. The AVR will restart automatically when it returns to normal.
7.5		The voltage of main electricity supply is low.	The AVR will restart automatically when it returns to normal.
7.6		There is fault.	Contact Leonics local distributors, Leonics Service Center, send e-mail to support@leonics.com or visit www.leonics.com.

Item	Message on the LCD screen	Causes	Solutions
7.7	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">ALARM : WAIT MANUAL RESTART</div>	The AVR is waiting for restart command (for manual restart mode only).	<p>Press   simultaneously once. AVR will restart when it detects no fault.</p> <p style="text-align: center; font-size: small;">manual restart/quit</p>
7.8	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">ALARM : SYSTEM High temperature</div>	The internal temperature is extremely high.	<ul style="list-style-type: none"> - Check the AVR ventilation whether anything is blocking. - Disconnect some loads due to the AVR is overload.
7.9	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">System: ALARM Over temperature</div>	The internal temperature is higher than the set point.	<ul style="list-style-type: none"> - Check the AVR ventilation whether anything is blocking. - Disconnect some loads due to the AVR is overload.
7.10	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">ALARM : System Overload</div>	The AVR is overload.	Disconnect some loads until the load level shows less than 100%.
7.11	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">ALARM : Overload Stop warning</div>	The AVR is going to shut down due to overload.	Disconnect some loads until the load level shows less than 100%.
7.12	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">System: ALARM Overload timeout</div>	The AVR shuts itself down due to running overload for long time.	<p>Disconnect some loads until the load level shows less than 100% and wait for 11 minutes. The AVR will restart automatically (for automatic restart mode) or press   simultaneously once (for manual restart mode).</p> <p style="text-align: center; font-size: small;">manual restart/quit</p>