

Connect Box

EN-
US



EN-US Installation and Operating Instructions



A710100016L29



AIR
TECHNIQUES equipped for life®

N1150

2203V007

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! Important information

1 About this document

These installation and operating instructions are an integral part of the unit.

 Air Techniques shall not be held liable and offers no guarantees of the safe and smooth operation of this unit if you fail to comply with notes and instructions contained in these Installation and Operating Instructions.

The German version of the installation and operating instructions is the original manual. All other languages are translations of the original manual.

1.1 Warnings and symbols

Warnings

The warning notes in this document highlight possible injury to persons or damage to machinery.

They are marked with the following warning symbols:

 General warning symbol

The warnings are structured as follows:

 **SIGNAL WORD**

Description of type and source of danger

Here you will find the possible consequences of ignoring the warning

› Follow these measures to avoid the danger.

The signal word differentiates between different levels of danger:

- **DANGER**
Direct danger of severe injury or death
- **WARNING**
Possible danger of severe injury or death
- **CAUTION**
Risk of minor injuries
- **NOTICE**
Risk of extensive material/property damage

Miscellaneous symbols

These symbols are used in the document and on or in the unit:

-  Note, e.g. specific instructions regarding the efficient use of the unit.
-  Take note of the accompanying electronic documents.
-  CE mark
-  Conformity mark of the UK and Northern Ireland
-  Distributor
-  Manufacturer
-  Serial number
-  Part number
-  Non-ionizing electromagnetic radiation
-  Dispose of correctly in accordance with EU Directive 2012/19/EU (WEEE).
-  Comply with the lower and upper temperature limits
-  Comply with the lower and upper humidity limits
-  SGS-tested product safety

1.2 Copyright information

All electronic drawings, processes, names, software, and appliances mentioned here are protected under copyright.

Printing or copying these Installation and Operating Instructions, including excerpts thereof, may only be carried out with the written approval of Air Techniques.

2 Safety

The unit has been developed and designed appropriately such that hazards are largely excluded if the unit is used in accordance with its Normal Use.

Nevertheless, residual hazards may remain. You should therefore observe the following notes.

2.1 Unauthorized modification

Pursuant to Part 15.21 of the FCC rules, any changes or modifications to this equipment not expressly approved by the manufacturer may cause, harmful interference and void the FCC authorization to operate this equipment.

2.2 Intended use

The device is designed exclusively for measurement, analysis and transmission of device data of practice supply units in the field of dentistry.

2.3 Normal use

The Connect Box may only be used in combination with practice supply units that meet the specified requirements in terms of rated voltage and rated current.

Compliance with the manufacturer information regarding installation, maintenance and service is required.

2.4 Improper use

Any other usage or usage beyond this scope is deemed to be improper. The manufacturer accepts no liability for damages resulting from this. In these cases the user/operator will bear the sole risk.

This unit must not be used in operating theaters or similar rooms, in which hazards may arise from the combustion of flammable materials.

2.5 Systems, connection with other devices

Additional devices connected to medical electrical devices must be proven to conform with their corresponding IEC or ISO standards.

Anyone connecting additional devices to medical electrical devices is a system configurator and is therefore responsible for ensuring that the system meets the standard requirements for systems. It shall be noted that local laws take precedence over the requirements outlined above.

2.6 General safety information

- › Comply with the guidelines, laws, rules and regulations applicable at the site of operation when you use this unit.
- › Prior to each use, check the function and proper condition of the device.
- › Do not convert or modify the unit.
- › Comply with the Installation and Operating Instructions.
- › Make the Installation and Operating Instructions always available to the operator in the vicinity of the device.

2.7 Specialist personnel

Operation

Persons operating the unit must ensure safe and correct handling based on their training and knowledge.

- › Instruct or have every user instructed in handling the unit.

Units for commercial use may not be operated or used by:

- People lacking the necessary experience and knowledge
- People with reduced physical, sensory or mental capabilities
- Children

Installation and repairs

- › All installation, resetting, alteration, expansion, and repair work must be carried out either by Air Techniques personnel or by a suitably qualified person approved by Air Techniques.

2.8 Protection from electric shock

- › When working on the units observe all the relevant electrical safety regulations.
- › Immediately replace any damaged cables or plugs.
- › Make sure that the connection point is free of voltage when you connect the unit to the power supply.
- › The connection to the power supply may only be established by a qualified electrician.

2.9 FCC note

This device has been tested and complies with the limits for a class B digital device as set out in part 15 of the FCC regulations. These limits are designed to provide adequate protection against harmful interference in residential environments. This device generates, uses, and can emit high-frequency energy, and it can cause harmful interference to wireless communication systems if it is not installed and used in accordance with the instructions. However, this statement does not offer a guarantee that no interference will occur in a certain installation. If this device causes harmful interference to radio or TV reception (this can be tested by switching the device off and back on again), users are recommended to attempt to eliminate the interference by taking one or more of the following measures:

- › Realign or reposition the reception aerial.
- › Increase the distance between the device and the receiver.
- › To meet FCC requirements on HF exposure compliance, a safety distance of at least 20 cm must be maintained between the device's internal aerial and all persons.
- › Connect the device to a power outlet on a different circuit to the one the receiver is connected to.
- › Consult a dealer or experienced radio/TV technician.

2.10 Transport

Only the original packaging ensures optimum protection for the unit during transport. If necessary, the original packaging for this unit can be ordered from Air Techniques.



Air Techniques cannot be held responsible for any damage resulting from transport in unsuitable packaging, even during the warranty period.

- › Only transport the unit in its original packaging.
- › Keep all packaging away from children.

2.11 Disposal

Europe

Device



Dispose of the unit correctly. Within the European Union, the unit must be disposed of in accordance with EU Directive 2012/19/EU (WEEE).

- › If you have any questions about the correct disposal of parts, please contact your dental trade supplier.

Rest of world

Devices and electronic components must be disposed of by a suitable disposal and recycling facility. It must be ensured that the items are disposed of in accordance with the locally applicable legislation at national/regional/local level.



3 Overview

3.1 Scope of delivery

The following items are included in the scope of delivery (possible variations due to country-specific requirements and/or import regulations):

Connect Box **N1110**

- Network cable (16.4 ft / 5 m)
- Mounting hardware
- Short description

4 Technical data

Electrical data		1~	3~
Nominal Voltage	V	100 - 240	200 - 400
Mains frequency	Hz	50 / 60	
Max. connected current	A	≤ 28	≤ 24
Max. wire cross-section	mm ²	6 AWG10	
Diameter of connection cable	in (mm)	0.31 - 0.51 (8 - 13)	
Type of protection		IP 20	
Protection class		I	

Sensor characteristics

Measuring accuracy: voltage	%	±5	
Measuring accuracy: current	%	±3	
Measuring accuracy: temperature	F (°C)	±7.2 (±4)	
Response time of temperature measurement	h	3	

General technical data

Weight	lb (kg)	1.37 (0.62)	
Dimensions (H x W x D)	in (cm)	8.7 x 7.9 x 2 (22 x 20 x 5)	

Network connection

LAN technology		Ethernet	
Standard		IEEE 802.3u	
Data rate	Mbit/s	100	
Connector		RJ45	
Type of connection		Auto MDI-X	
Type of cable		≥ CAT5	

Network connection Wi-Fi

LAN technology		Wi-Fi	
Protocol		IEEE 802.11 b/g/n	
Data Rate	Mbit/s	150	
Frequency	GHz	2.4	

Ambient conditions during storage and transport

Temperature	F (°C)	-0.4 to +150.8 (-18 to +66)	
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Ambient conditions during storage and transport

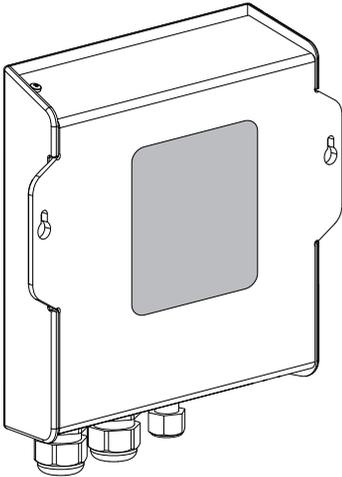
Relative humidity	%	max. 95
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Ambient conditions during operation

Temperature	F (°C)	+50 to +104 (+10 to +40)
Relative humidity	%	max. 90
Air pressure	hPa	690 - 1030
Height above sea level	ft (m)	6562 (< 2000)

4.1 Model identification plate

The type plate is located on the rear of the device.

**4.2 Conformity assessment**

This device has been subjected to conformity acceptance testing in accordance with the current relevant guidelines of the European Union. This equipment conforms to all relevant requirements.

4.3 Approvals

FCC ID

2AC7Z-ESP32WROVER

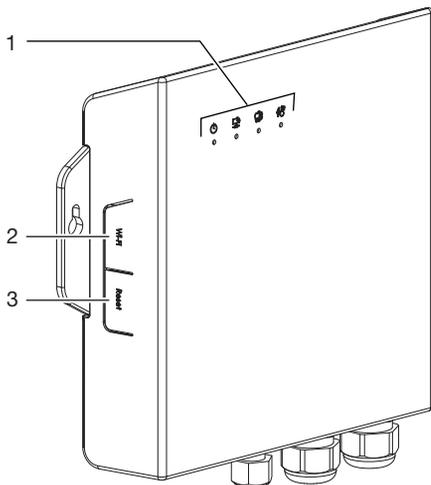
5 Function

The Connect Box monitors practice supply units, such as compressors, suction units or amalgam separators, possessing no integrated monitoring electronics. It measures voltage, current and room temperature. This is used to determine data of the practice supply unit (e.g. average duty cycle) and transmit such data via Ethernet or Wi-Fi to the Vision Monitor software.

The device has an integrated microphone for monitoring of the machine noises. But the microphone is not activated. No noises are recorded or analyzed.

The Connect Box is suitable for use in combination with medical devices.

5.1 Display / operation



- 1 LEDs
- 2 Wi-Fi button
- 3 Reset button

The status of the Connect Box and connected practice supply unit is indicated by the LEDs.

LED	Status	Meaning
 Power		on
		starts up
		Reset to factory settings
		System error

LED	Status	Meaning
 Network		Connected to local Vision Monitor
		Connected directly to Cloud
		Not connected
		Wi-Fi configuration mode
		Connected to network
 Practice supply unit		Practice supply unit switched off
		Practice supply unit switched on
		Practice supply unit not configured
		Practice supply unit warning message
		Imminent maintenance
		Practice supply unit error message
 Environment		Ambient conditions ok
		Ambient conditions not configured
		Warning ambient conditions (voltage/temperature)
		Critical ambient conditions (voltage/temperature)

Legend:

	LED off
	LED on
	LED flashing



6 Installation

6.1 Mounting the unit on the wall

The Connect Box is to be wall mounted in the same room as the practice supply unit to be connected to the Connect Box.

The Connect Box must be positioned appropriately such that individuals can keep a minimum distance of 8 inch (20 cm) during installation and operation of the unit.



Use suitable mounting hardware for the mounting location.

- › Position the Connect Box and mark the drill holes on the wall.
- › Drill the holes.
- › Install anchors and screws appropriately to allow the Connect Box to be hooked into them.

6.2 Electrical connection

Combining devices safely

Take care when connecting units together or to parts of other systems as there is always an element of risk (e.g. due to leakage currents).

- › Connect units only if there is no hazard for the operator or environment.
- › Only connect units when it is safe to do so and when there is no risk of damage or harm to the surroundings.
- › If it is not completely clear from the data sheet of the unit that such connections can be safely made or if you are in any doubt, always get a suitably qualified person (e.g. the relevant manufacturer) to verify that the setup is safe.

Electrical safety when making connections



DANGER

Danger to life from electric shock

Potentially fatal voltage is applied at the connection point of the power grid.

- › Make sure that the connection point is free of voltage.
 - › The connection to the power supply may only be established by a qualified electrician.
- › Make sure that none of the electrical cables leading to the unit are under any mechanical tension.
 - › Before start-up, check the mains voltage against the voltage indicated on the type plate (see also "4 Technical data").
 - › Units with a power plug: Connect the unit to a correctly installed power outlet only.
 - › Permanently connected units: Install an all-pole disconnect facility (all-pole disconnect switch) with a contact opening width >3 mm in the electrical connection to the mains power supply. It must be possible to secure the disconnect switch so that it cannot be inadvertently switched back on again.
- Make sure that the electrical connections to the mains power supply are established in accordance with current valid national and local regulations and standards governing the installation of low voltage units in medical facilities.

Information about electrical connections

Electrical fusing

LS switch based on wire cross-section listed in IEC 60898.

Electrical connection plan

 Note the following when you connect the unit:
 The protective conductor must always be longer than the live conductor.
 Use appropriate wire end ferrules when you connect the wires.



Connecting suction units to the control box, the Connect Box must be connected between the mains connection and the control box.

If additional consumers are connected to the control box, their currents must be considered in the configuration in Vision Monitor.

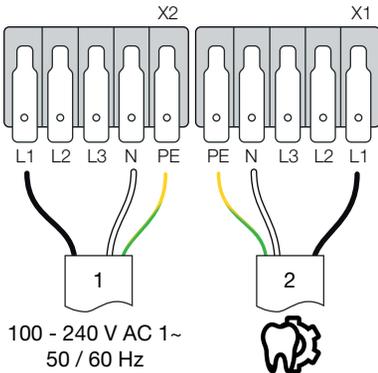


Fig. 1: Connection plan Connect Box single-phase

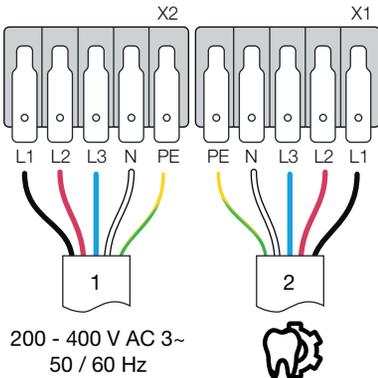


Fig. 2: Connection plan Connect Box three-phase

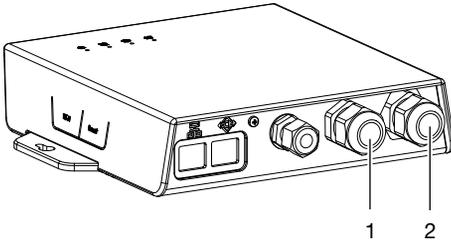
Connecting cable

The wire cross-section depends on the connected current, cable length and ambient temperatures of the units to be connected. See also "4 Technical data".

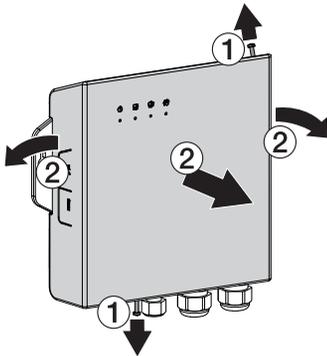
For information regarding the connected current (current consumption of the device to be connected), see Technical Data of the device.

The connecting cables are possible:

Type of connecting cable	Identification symbol	
	IEC	CENELEC
PVC-insulated cables		
Lightweight PVC hose line	60227 IEC 52	H03VV-F
PVC hose line	60227 IEC 53	H05VV-F
Heat resistant lightweight PVC hose line	60227 IEC 56	H03V2V2-F
Heat resistant PVC hose line	60227 IEC 57	H05V2V2-F
Rubber-insulated lines		
Rubber hose line	60245 IEC 53	H05RR-F
Rubber hose line with polychloroprene jacket	60245 IEC 57	H05RN-F
High flexibility lines		
Cross-linked PVC hose line	60245 IEC 88	–

Fixed connection

- 1 Mains AC power connection
 - 2 Connection to the practice supply unit
- › Remove the screws on the top and bottom of the unit.
 - › Slightly bend the sides of the housing cover and pull the housing cover off towards the front.

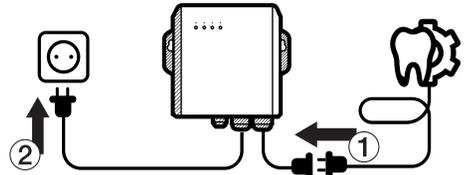


- › Connecting cable dimensions, see "Connecting cable".
- › Connect the Connect Box as per the connection plan, see "Electrical connection plan".
- › Reattach the housing cover and affix it with the screws.

Electrical connection using a mains plug

 Use plugs and sockets in accordance with IEC 60083, IEC 309 or IEC 603203.

- › Connect a cable with plug and a cable with socket to the Connect Box. Comply with the connecting plan and cable cross-section (see "Information about electrical connections"). Cables are not included. They must comply with equipment rated voltage and current.
- › Connect the plug of the practice supply unit to the power socket of the Connect Box.
- › Connect the plug of the Connect Box to a power outlet.



The **Power**   LED flashes in blue while the Connect Box starts up.

The **Power**   LED glowing blue indicates that the Connect Box is switched on.

7 Commissioning and first start-up

7.1 Commissioning tests

- › Carry out the electrical safety check according to national law (e. g. housing leakage current).
- › Document the results.

The Connect Box can be used for monitoring of medical devices that were developed in compliance with IEC 60601-1. In this case, the leakage current of the system (Connect Box + monitored unit) must not exceed the required limits.

Max. ground leakage current of the Connect Box without unit: 0,4 mA

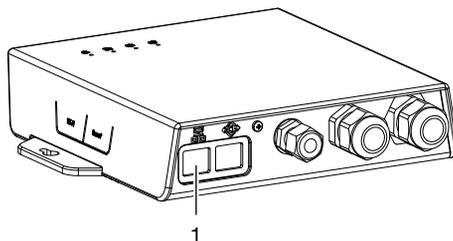
7.2 Network connection

The network connection can be established via Wi-Fi or a network cable.

The network connection is used to exchange information between the unit and the software installed on a computer, in order to:

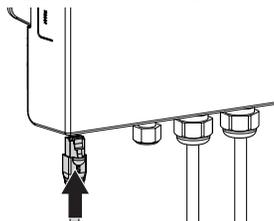
- Display parameters
- Indicate messages and error situations
- Transmit data for archiving
- Provide documents concerning the devices

Connecting the unit via the network cable



1 Network connection

- › Use the network cable to connect the Connect Box to the network.



The LED **Network**   flashes red
 The **Network**   being yellow indicates that the Connect Box is connected to the network.

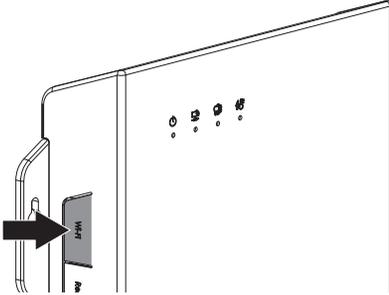
Connecting the unit to Wi-Fi

Connection of the device to the Wi-Fi requires an Wi-Fi-enabled computer or mobile device (e.g. tablet, smart-phone).



The connected practice supply unit can be configured during the configuration of the Wi-Fi. However, we recommend setting the parameters of the practice supply unit in the software, see "7.3 Configuring the unit".

- › Press the *Wi-Fi* button.



The **Network**   LED of the Connect Box flashes yellow.

- › Open the Wi-Fi settings on the computer or mobile device.
- › Connect the computer or mobile device to the Wi-Fi of the Connect Box *VSM*....
- › Open the page of the Connect Box in the web browser: <http://192.168.4.1>
- › Enter the SSID and password of the Wi-Fi router, possibly request the Wi-Fi settings from the network administrator.
- › Optionally, set the parameters in accordance with the parameter list, see "7.3 Configuring the unit".

Result:

Once the Wi-Fi connection is established, the **Network**   LED lights up yellow.

7.3 Configuring the unit

We recommend configuration in the Vision Monitor software.

Alternatively, the configuration can just as well be set directly on the Connect Box, see "Configuring the device directly (optional)".

During the configuration, the parameters of the connected practice supply unit are set.

The parameter list for the practice supply units is available on the Internet:

<https://www.airtechniques.com/en/connectbox-parameterlist/>



It is also possible to connect devices from third-party suppliers to the Connect Box. However, with regard to the monitoring of devices from third-party suppliers, Air Techniques accepts no liability for damage resulting from incorrect warning or alarm messages of the Connect Box.

Requirements:

- ✓ Connect Box connected to network.
- › Start Vision Monitor.
- › Configure the Connect Box based on the parameter list, also refer to the Vision Monitor manual.

Result:

Connect Box is configured.

The **Ambient**  and **Practice supply unit**  LEDs cease to flash and show the current status (see "5.1 Display / operation").

The configuration can be changed at any time.

Configuring the device directly (optional)

For direct configuration, a computer or mobile device in the network is required.

- › Open the site of the Connect Box in the web browser of the computer or mobile device:
http://192.168.4.1
- › Set parameters in accordance with the parameter list.

Result:

Connect Box is configured.

The *Ambient*  and *Practice supply unit* 

LEDs cease to flash and show the current status (see "5.1 Display / operation").

The configuration can be changed at any time.

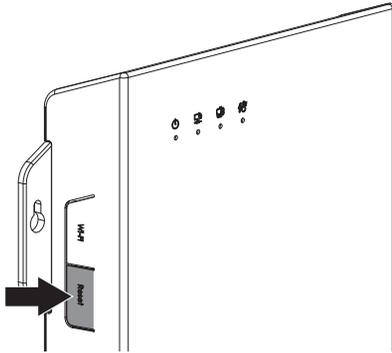
 Usage

8 Operation

8.1 Restart Connect Box

The firmware of Connect Box can be restarted. This resets the warning and error messages.

› Press the *Reset* button.

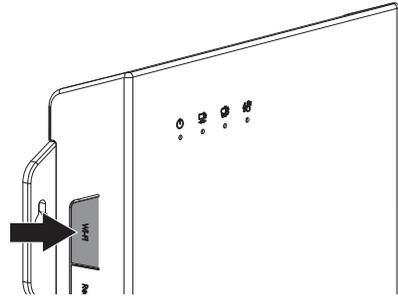


The *Power*   LED flashes blue. Connect Box starts up.
When Connect Box is on again, the *Power*   LED is blue.

8.2 Re-setting Connect Box to factory settings

Resetting to factory settings resets all settings of Connect Box.

› Press the *Wi-Fi* button for 10 seconds.



The *Power*   LED flashes yellow. The *Network*   LED flashes red.

When Connect Box is connected to the network by the network cable, the *Network*   LED soon is yellow again.

If Connect Box is connected to the network via Wi-Fi, the connection must be reestablished, see "7.3 Configuring the unit".

When the *Power*   LED is blue, Connect Box is reset to factory settings.

The LEDs *Practice supply unit*   and *Ambient*   flash blue.

The Connect Box can now be reconfigured, see "7.3 Configuring the unit".

? Troubleshooting

9 Tips for operators and service technicians



Any repairs above and beyond routine maintenance may only be done by suitably qualified personnel or by one of our service technicians.



Prior to working on the unit or in case of danger, disconnect it from the mains.

If there is an error or a warning message, the corresponding LED on the Connect Box is on or flashes.



LED on



LED flashing

More information is displayed in the Vision Monitor software.

Error	Possible cause	Remedy
● Device current too high 0x3A02000B	The device current being too high is a sign of wear.	› Inform your Service Technician.
● Device current too low 0x3A02000C	Practice supply unit does not work as expected.	› Inform your Service Technician.
● Line voltage too low 0x3A03000C (L1) 0x3A04000C (L2) 0x3A05000C (L3)	Line voltage far below valid tolerance. Faulty electrical installation. The line voltage being too low can damage the unit and reduce the performance.	› Have the installation checked by an electrician.
● Line voltage too high 0x3A03000B (L1) 0x3A04000B (L2) 0x3A05000B (L3)	Line voltage far higher than the valid tolerance. Faulty electrical installation. The line voltage being too high can damage the unit.	› Have the installation checked by an electrician.
● Device load too high 0x3A01000B	Device load higher than intended. Evidence of equipment damage.	› Inform your Service Technician.
● Ambient temperature too low 0x30060012	Ambient temperature is lower than the permitted ambient temperature of the device. The ambient temperature being too low can damage the unit.	› Heat the equipment room.
● Ambient temperature too high 0x30060011	The ambient temperature is higher than the permitted ambient temperature of the device. The ambient temperature being too high damages the unit.	› Improve the ventilation of the equipment room.

Error	Possible cause	Remedy
 ● Ambient temperature high 0x40060011	The ambient temperature is high. The ambient temperature being too high damages the unit.	› Improve the ventilation of the equipment room.
 ● Ambient temperature low 0x40060012	The ambient temperature is low. A heated room would promote optimal operation.	› Heat the equipment room.
 ● Line voltage high 0x4A03000B (L1) 0x4A04000B (L2) 0x4A05000B (L3)	The line voltage is higher than the valid tolerance. The electrical installation may be faulty. The line voltage being too high can damage the unit.	› If the line voltage continues to be high, have the installation checked by an electrician.
 ● Line voltage low 0x4A03000C (L1) 0x4A04000C (L2) 0x4A05000C (L3)	The line voltage is lower than the valid tolerance. The electrical installation may be faulty. The line voltage being too low can damage the unit and reduce the performance.	› If the line voltage continues to be low, have the installation checked by an electrician.
 ● Device current high 0x4A02000B	The device current is higher than expected.	› If the device current continues to be high or increases even more, notify a service technician.
 ● Device current low 0x4A02000C	Device current is lower than expected.	› If the device current continues to be low or decreases even more, notify a service technician.
 ● Unit needs maintenance 0x51230013	Maintenance interval expired.	› Perform maintenance according to the operating instructions.



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