

HF-430NEO Series

Analog Input/Output option

Model : P1-AG

User's Guide



NOTICE

1. Make sure that this user's guide is delivered to the end user of inverter unit.
2. Read the instruction manual and user's guide before installing or operating the inverter unit, and store it in a safe place for reference.

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Introduction

Thank you for purchasing the P1-AG: Analog Input/Output option for HF-430NEO series inverter. This instruction manual describes how to handle and maintain the P1-AG. Please read this manual carefully before using the P1-AG, and keep it handy for those who operate, maintain and inspect it.

■ User's Guide(this document)

The User's Guide provides detailed information necessary for handling the product.

Please make sure to read User's Guide for proper use.

Always use the P1-AG strictly within the range described in the User's Guide and perform proper inspection and maintenance to prevent failures or accidents.

The latest version of the User's guide can be obtained through our website.

■ Handling the inverter HF-430NEO

For handling the HF-430NEO, please make sure to read its Instruction manual and User's Guide.

■ For a proper use

Before using the inverter, please read carefully the HF-430NEO Instruction manual and User's Guide, the P1-AG User's Guide.

In Addition any personnel handling or performing maintenance of the product must read carefully the HF-430NEO Instruction manual and User's Guide, the P1-AG User's Guide.

Before any attempt to install, operate, maintain or inspect this equipment, a complete understanding of the equipment specifications, safety instructions, precautions, handling and operation instructions is required. Please follow all the specifications and instructions for a proper use. Additionally, periodically review the HF-430NEO Instruction manual and User's Guide, the P1-AG User's Guide.

■ Precautions

It is prohibited to reproduce or reform this document partially or totally in any form without the publisher's permission.

The contents of the document are subject to change without prior notice.

Any handling, maintenance or operation method NOT described on the HF-430NEO Instruction manual and User's Guide, the P1-AG User's Guide is not covered by the product warranty.

Please DO NOT perform any procedure NOT described on the HF-430NEO or the P1-AG manuals since it can be the cause of unexpected failures or accidents.

We are not responsible for any impact from operations regardless of unexpected failure or accident due to operation or handling of the product in a manner not specified on the HF-430NEO Instruction manual and User's Guide, the P1-AG User's Guide. We appreciate your understanding.

Note that, in case the HF-430NEO Instruction manual and User's Guide, the P1-AG User's Guide are enclosed, they should be delivered to the end user of the inverter. Also make sure to download and keep accessible any other related guides or instruction manuals for the end user.

■ Trademark

- CRIMPFOX® is a registered trademark of Phoenix Contact GmbH & Co. KG.
- Any other brand names and product names mentioned in this guide are trademarks or registered trademarks of their respective owners.

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Chapter 1 Safety Precautions

1.1 About this chapter

This chapter contains the information about Safety precautions during the installation, wiring, operation and inspection.

Before installation, wiring, operation, inspection, or usage please read completely and fully understand this guide.

1.2 Types of warnings

In this guide, the safety precautions as well as residual risks are categorized by degree of risk as “Danger” , “Warning” and “Caution” .

The definition of each category is described below.

Danger


This category warns the user that in case of an incorrect or improper handling, it leads to a dangerous situation that have a high risk of causing death, serious injuries and/or major property damage.

Warning


This category warns the user that in case of an incorrect or improper handling, it leads to a dangerous situation that may cause death, serious injuries and/or major property damage.

Caution

This category warns the user that in case of an incorrect or improper handling, it leads to a dangerous situation that may cause physical injuries and/or property damage.

However, any content labeled with “Caution” and depending on the case, might have a possibility of leading to a highly dangerous situation.







It is extremely important that you follow the instructions and warnings.

Furthermore, content labeled with “” must be followed and paid special attention.

1.3 Symbol explanation

In this guide, there are some explanatory notes using different symbols. Please pay attention to this content and keep in mind its information.

Symbol definition

	When handling this product, this symbol indicates danger, warning or caution about ignition, electric shock, high temperature or other dangers. Inside or near the  symbol, the specific content will be shown.	
		This symbol indicates “General hazard not specified, be cautious” .
		This symbol indicates “Electric shock hazard” .
	This symbol indicates prohibited actions “Actions that should not be done” when handling this device.	
	This symbol indicates actions that must be done based on the instructions.	

1.4 Precautions

1.4.1 Please be careful!



Danger



Caution

- If handled incorrectly or improperly, it might cause death, serious physical injuries, or damage to the inverter, motor or even the entire system.



Do

- Before installation, wiring, operation, inspection, or usage please read and fully understand this guide and other references.



Caution

- There will be additional warnings about hazards and failure causes in other chapters.



Do

- Before installation, wiring, operation, inspection, or usage please read and fully understand this guide.



Caution

- In order to explain this device details the illustrations in this guide might show this device without covers.



Do

- Before operating this device please return all the covers to the original position, and follow all the necessary regulations and instructions written in this guide.

1.4.2 Precautions during the installation !

**Danger**● **Risk of Fire!**Fire
Hazard

- DO NOT place inflammable objects nearby
- DO NOT let scraps of wire, welding sputtering, irons scraps or other objects get inside the device.



Prohibited

- Avoid installing this device in places with high temperature, high humidity, Condensation-prone conditions, dusty conditions, corrosive gas, explosive gas, flammable gas, grinding fluid mist, hydrogen sulfide or salt damage prone conditions. Additionally, it is recommended to install this device in ventilated room not exposed to direct sunlight.



Do

● **Risk of Injury!**

Injury



Prohibited

- DO NOT install or operate products with damage or missing parts.

● **Risk of an Inverter failure!**

Failure

- This device is a precision equipment, DO NOT drop it, or give it a strong shock.
- DO NOT get on (step on) or place heavy objects on this device.
- When handling the object, avoid places prone to static electricity(like carpets).



Do

- Since the human body can get charged with static electricity, as a safety measure please touch a safe metallic surface before handling this device.

1.4.3 Precautions during the wiring!

**Danger**Electric
shock
and Fire
hazard● **Risk of an electric shock and/or fire!**

- Be sure to ground the inverter.
- Entrust the wiring work only to a qualified electrician.
- Before the wiring work make sure to turn off the power supply and wait for more than 10 or 15 minutes depending on the inverter model.*



Do

- Confirm that the charge lamp is OFF and the DC voltage between terminals P and N is 45 V or less.

* For HF4322-5A5 to HF4322-022, HF4324-5A5 to HF4324-022 models the wait time is 10 minutes.

For HF4322-030 to HF4322-055, HF4324-030 to HF4324-055 models the wait time is 15 minutes.



Failure

● **Risk of inverter failure!**

Prohibited

- DO NOT pull any wire after wiring.



Electric
shock
and
injury



Do

● Risk of an electric shock and/or injury!

- Perform the wiring only after installing the inverter.



Warning



Electric
shock
and
injury



Do

● Risk of an electric shock and/or injury!

- DO NOT operate/switch any of the switches from the 4 pole DIP switch on this device.*
When this device is shipped all switches are turned off.

- If any of the switches from the 4 pole DIP switch is operated/switched, this device will not work as intended and it might be the cause of failure.

- Please handle the cables properly and DO NOT let them get damaged. Using damaged cables will not only interfere with the correct operation of this device but also might be the cause of a system failure.

* 4 pole DIP switch is implemented on the board exposed from the case of this product.



Fire
hazard



Do

● Risk of Fire!

- Please tighten the screws and bolts with the specified torque.
(Please refer to the inverter user's guide)

- Verify that none of the screws and bolts are loose.
- Make sure that the inverter and this device are fixed together with the securing screw.
- Make sure that the connectors are properly fixed.

1.4.4 Precautions during operation and trial operation!



Danger



Electric
shock
and Fire
hazard



Prohibited

● Risk of an electric shock or fire!

- DO NOT touch the inside of this device, check the signal, do any wiring or plug/unplug the connectors while it energized.
- DO NOT insert any stick or rod like objects inside this device while it is energized.



Injury
and Fire
hazard



Prohibited

● Risk of an injury and/or fire!

- DO NOT touch the inside of this device or the inverter while they are energized.



● **Risk of an electric shock!**

Electric shock



Prohibited

- Make sure to fasten all the screws of this device before turning it on. DO NOT detach this device while it is energized or the inverter capacitors are still charged.
- Additionally DO NOT touch the inside of the inverter while the inverter capacitors are still charged.
- DO NOT touch this device with wet hands.



Warning



● **Risk of an injury and/or device damage!**

Injury or device Damage



Do

- By using this device it becomes easier to change the settings and the output frequency of the inverter. When changing the settings or the output frequency of the inverter please make sure that it is within the supported range by the gear motor and/or the equipment.
- In case this device is being used to make the inverter produce high frequency outputs for a motor or other equipment, make sure with the respective manufacturer that the motor or the equipment can tolerate the high frequency output given by the inverter.
- During operation verify the motor rotation direction, and that there are no irregular sounds or vibrations.

1.4.5 Precautions during Maintenance/ Inspection!



Danger



● **Risk of an electric shock!**

Electric shock



Do

- Before the wiring work make sure to turn off the power supply and wait for more than 10 or 15 minutes depending on the inverter model.*
(Confirm that the charge lamp is OFF and the DC voltage between terminals P and N is 45 V or less.)



Prohibited

- Entrust the maintenance, inspection and/or part replacement only to a specialized personnel.
(Be sure to remove wristwatches and metal accessories, e.g., bracelets, before maintenance and inspection work and use insulated tools for the work).

* For HF4322-5A5 to HF4322-022, HF4324-5A5 to HF4324-022 models the wait time is 10 minutes.
For HF4322-030 to HF4322-055, HF4324-030 to HF4324-055 models the wait time is 15 minutes.

1.4.6 Precautions for disposal!



Danger

- Risk of an injury and/or an explosion!



Injury and
explosion
hazard

- Outsource to a qualified industrial waste disposal contractor when discarding this device.
Disposing of this device on your own may result in the production of poisonous gas
- Contact your sales agent if you need to get this device fixed.



Do

- A qualified waste disposer includes industrial waste collector/transporter and industrial waste disposal operator. Follow all laws and decrees related to procedures of waste management and public cleansing when disposing of this device.

1.4.7 Other Precautions



Danger



Electric
shock
injury
and Fire
hazard

- Risk of an injury, an electric shock and/or fire!

- DO NOT modify this device.



Prohibited

* In addition to the precautions described above, there are other precautions described in the chapter 8 of the inverter user's guide. Please read and follow those precautions as well.

2

Chapter 2 Overview

2.1 About this chapter

This chapter specifies the devices that this guide will describe. Additionally, it contains information necessary to clearly understand this guide, the objectives of this guide.

2.2 Applicable devices

The contents of this guide will apply to the P1-AG device. For information about the inverter please refer to the HF-430NEO user's guide or the instruction manual.

2.3 Before reading this guide

This guide is aimed for people who purchase, handle, install or connect control equipment, design systems or manage factories.

This guide units are based on the SI system.

2.4 Guide objectives

The objectives of this guide are:

- explain how to wire and connect the device.
- explain how to set the necessary parameters.

2.5 Guide outline

This guide has the following structure.

- **The chapter 1: Safety Precautions**

"Safety Precautions" contains the safety instructions for installing, wiring, operating, maintaining and inspecting this device.

- **The chapter 2: Overview**

"Overview" contains information necessary to clearly understand this guide.

- **The chapter 3: P1-AG**

"About the P1-AG" contains the explanation about this device appearance and general features.

- **The chapter 4: Enclosed Items**

"Enclosed Items" contains information about the items included with this device.

- **The chapter 5: Installation and Wiring**

"Installation and Wiring" contains information for installing and wiring this device on the inverter.

- **The chapter 6: Function of Analog Input/Output**

"Function of Analog Input/Output" contains the explanation of the inverter parameters that relate with this device.

- **Chapter 7: Troubleshooting**

"Troubleshooting" contains the explanation of inverter error (trip) status and its trouble shooting while in use this device.

- **Chapter 8: Specifications**

"Specifications" contains the specifications of this device.

3

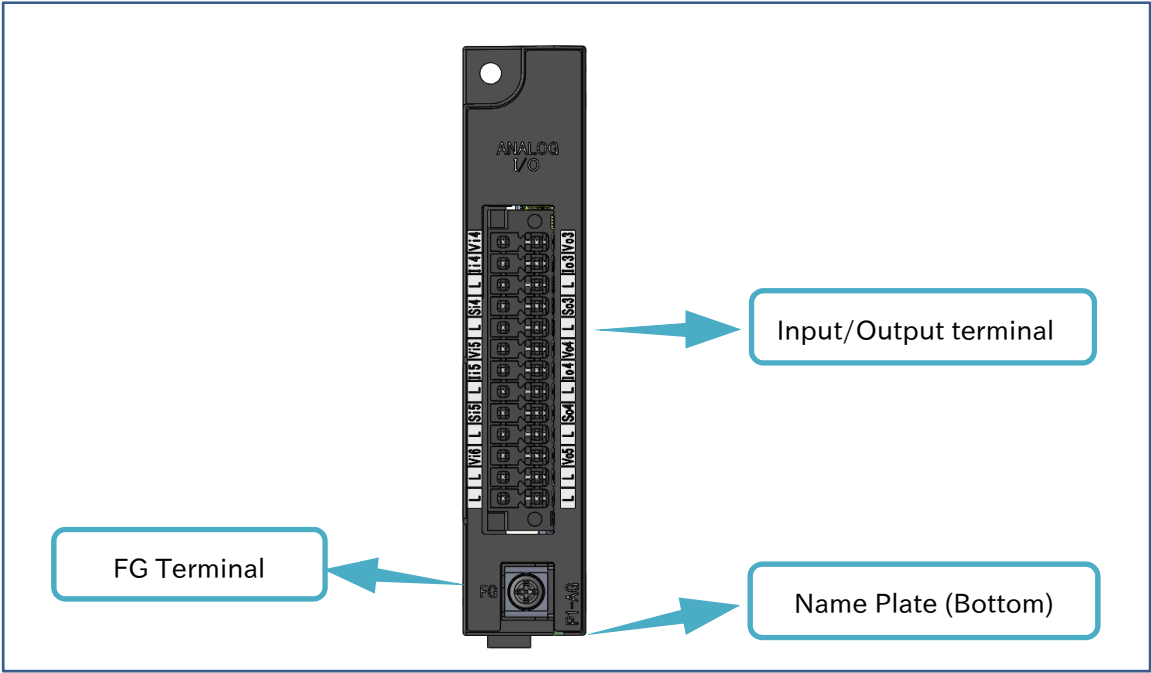
Chapter 3 P1-AG

3.1 About this chapter

This chapter contains the explanation about this device external features and information on the name plate.

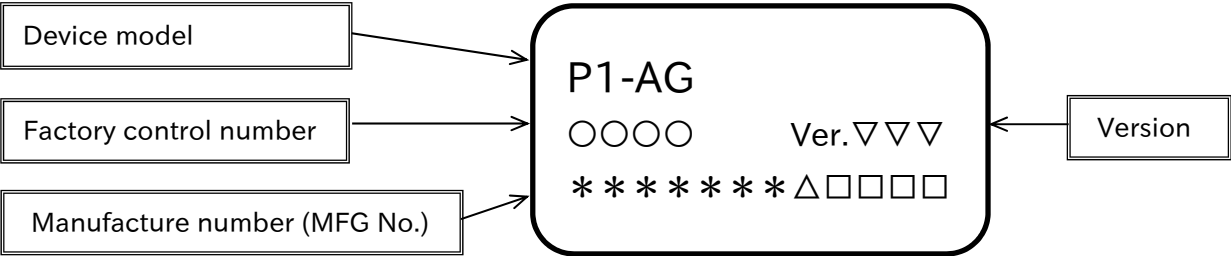
3.2 P1-AG appearance and nomenclature

An external view of this device is shown below.
For installing this device, connectors and other parts refer to the chapter 5 "Installation and Wiring".



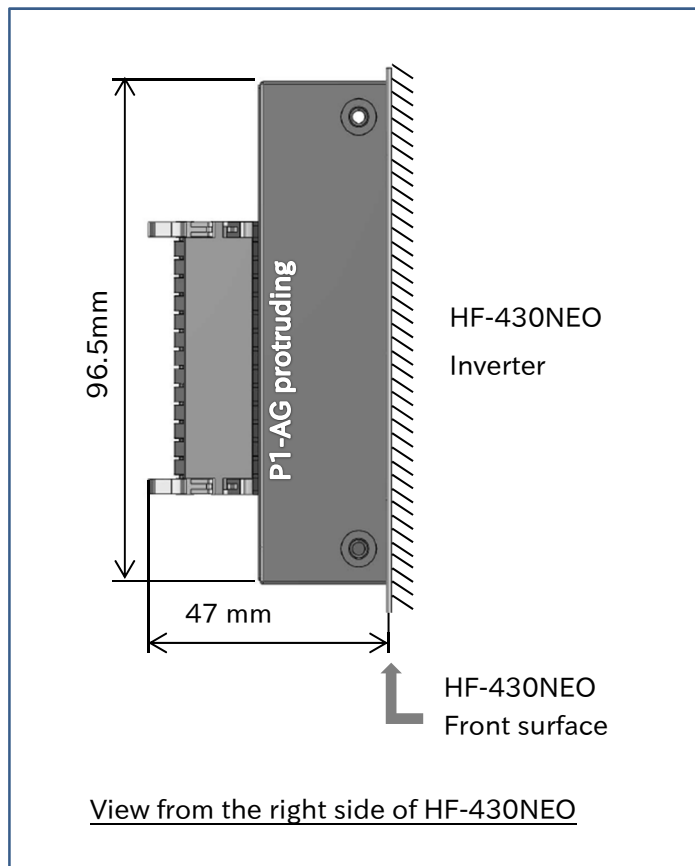
3.3 Name plate

The P1-AG name plate gives the following information.



3.4 Dimensions after installed

The dimensions of this device after it is installed on the HF-430NEO are shown in the image below. As shown on the image a part of this device will stand out from the HF-430NEO. Please be cautious when installing the P1-AG.



4

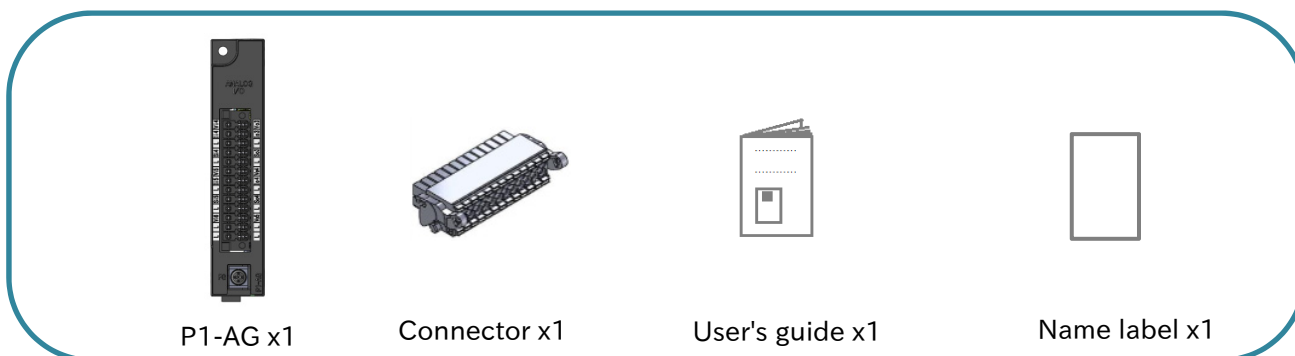
Chapter 4 Enclosed Items

4.1 About this chapter

This chapter contains information about the items enclosed with the P1-AG. Additionally, it is explained how to inspect and verify this product after its purchase.

4.2 About the enclosed items

- Enclosed items



Contact your sales agent immediately in case there are defects or imperfections.

4.3 Verification after the purchase

4.3.1 Verification when unpacking

- Please verify the items written on the right when unpacking.
- In case there is any doubt or trouble with the product please contact your sales agent as soon as possible.



Check that the items were not smashed or damaged during the delivery.



Check that
there is a P1-AG,
there is a connector,
there is a User's Guides,
there is a name label,
when unpacking.



Please check again that your order match with the name plate of the device.

5

Chapter 5 Installation and Wiring

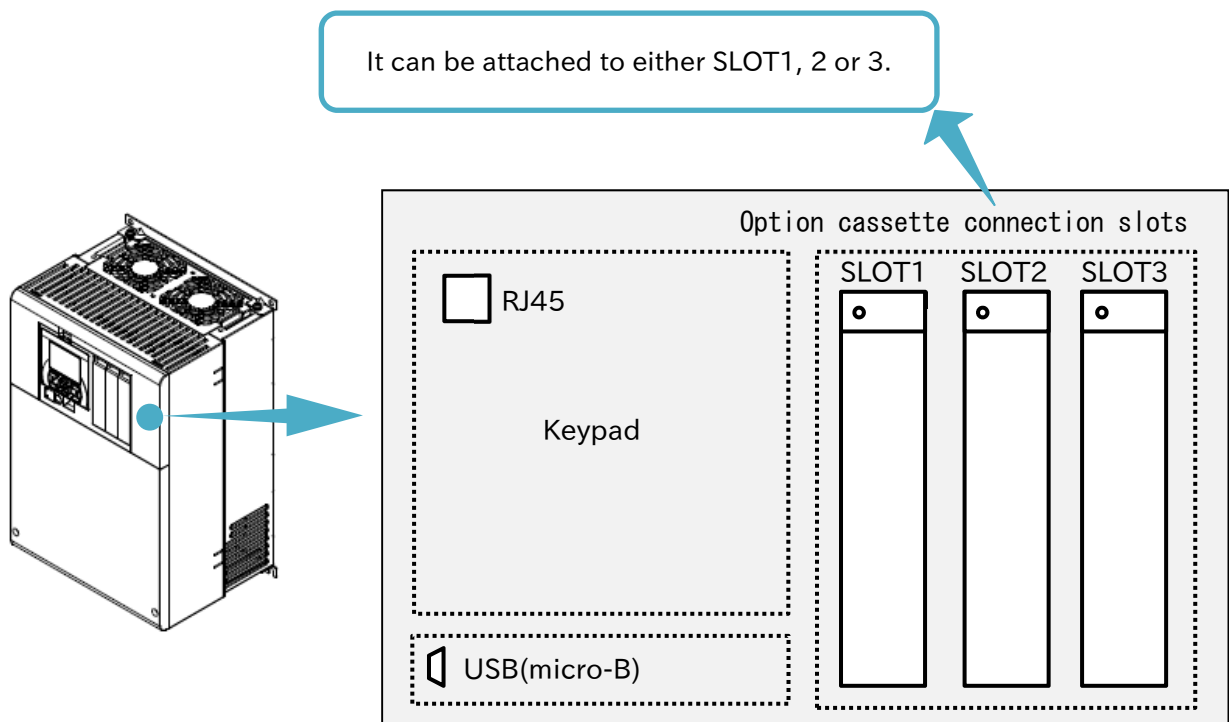
5.1 About this chapter

This chapter contains information for installing and wiring this device on the HF-430NEO. For information about the HF-430NEO installation, please refer to the HF-430NEO user's guide. Additionally, when doing any work or operation, always follow the safety instructions and cautions given in the chapter 1.

5.2 Installation

5.2.1 Installation

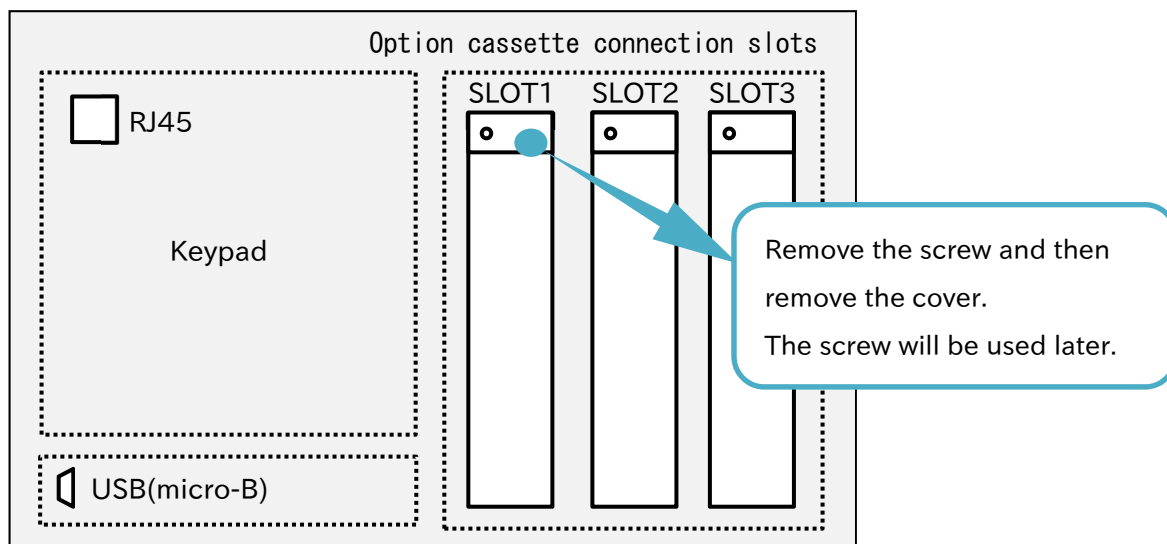
The P1-AG can be attached to any of the 3 option slots of HF-430NEO inverter.



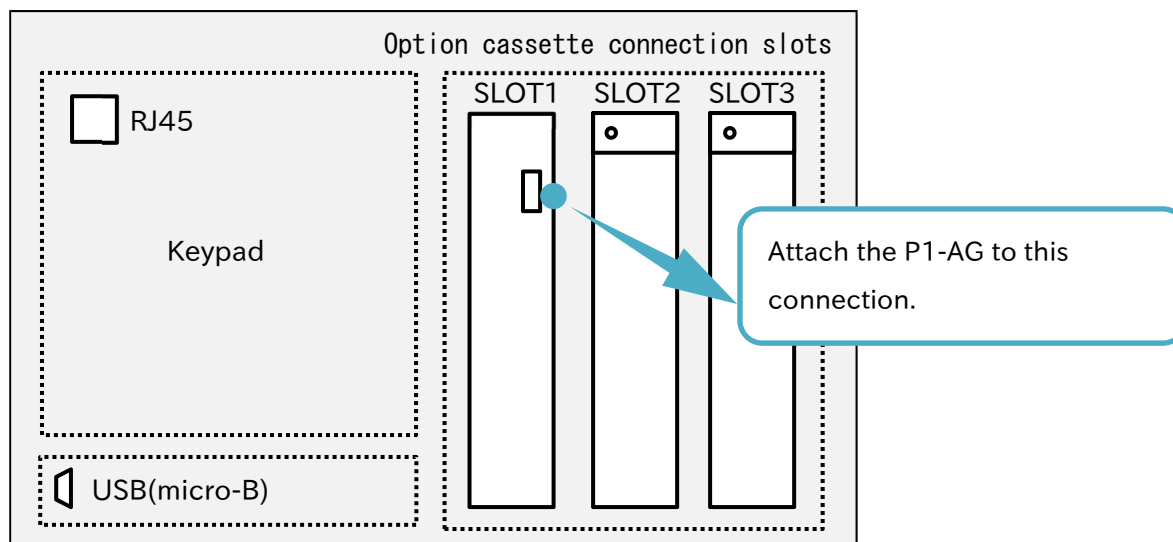
5.2.2 How to install

For explanation purposes, it will be assumed that the P1-AG is going to be installed in the SLOT1.

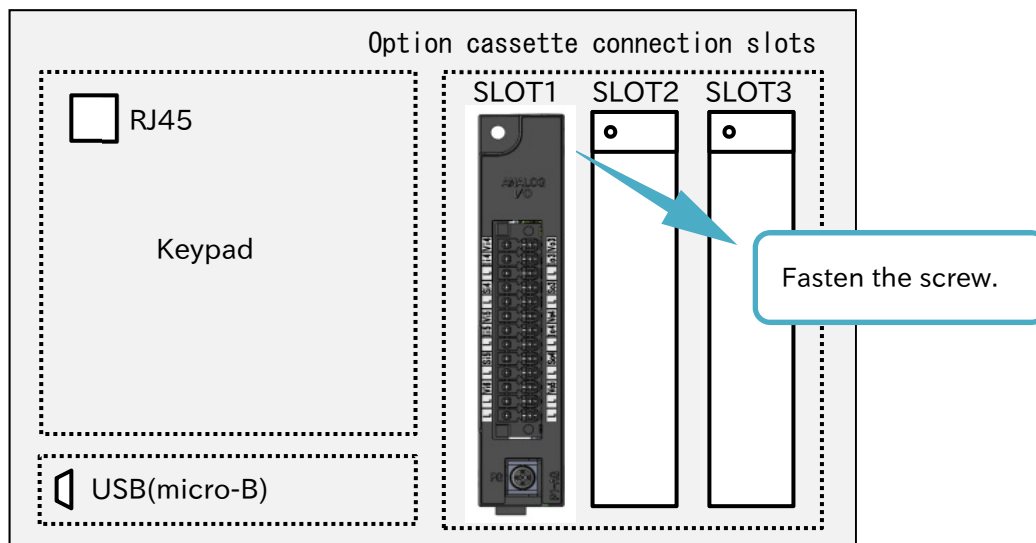
- (1) Remove the cover of the option cassette connection slot. Despite the removed cover will no longer be needed, it is recommended to keep it in a safe place. However the screw that secured the cover will be used to secure the P1-AG.



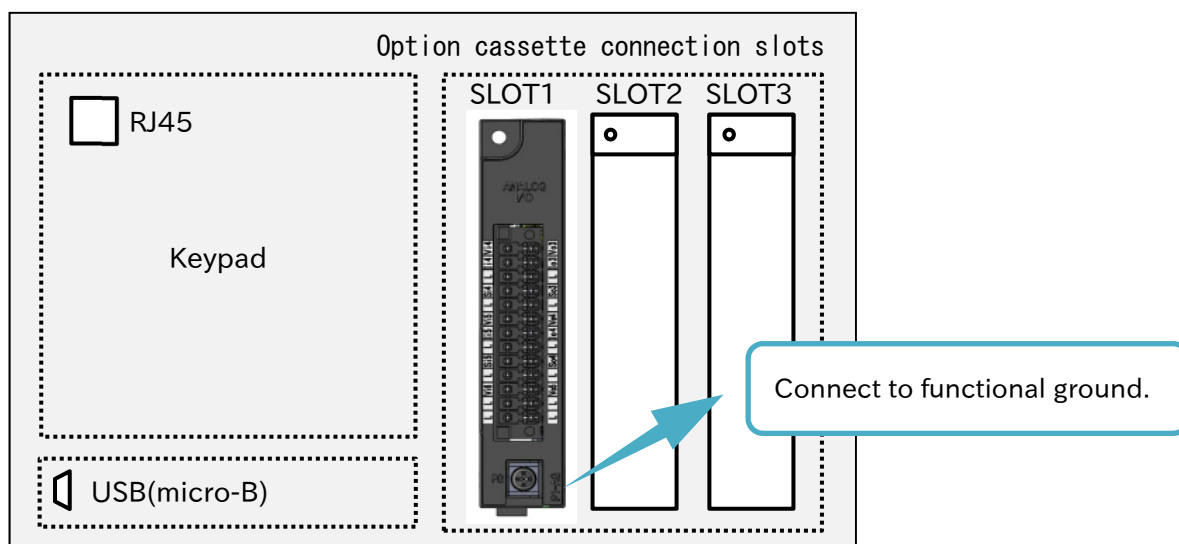
- (2) Attach the P1-AG. The slots 2 and 3 have one more connection in the lower side. However, the P1-AG will not need that connection.



(3) Secure the P1-AG with the screw removed in procedure (1).



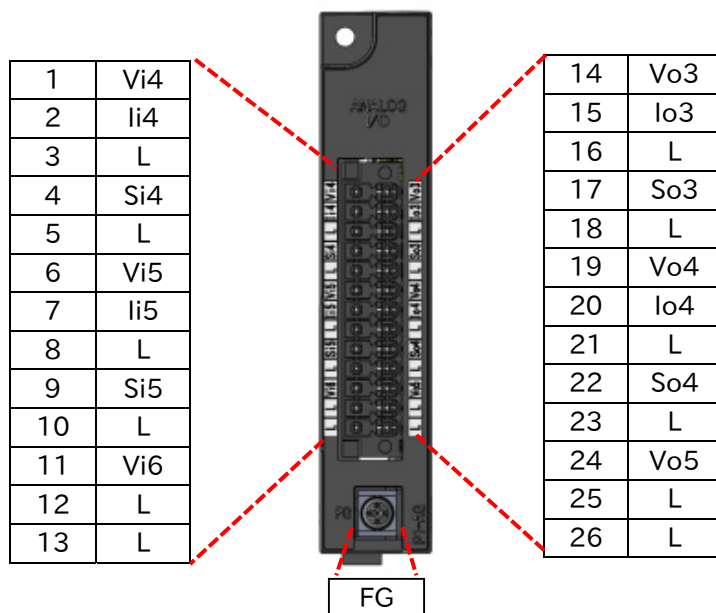
(4) Connect the FG terminal to functional ground.



5.3 Terminal block and wiring

Terminal arrangement, symbols and specifications of P1-AG are shown the followings.

■ Terminal arrangement



■ Terminal specifications

Terminal Name		Symbol	Description	Electrical Characteristic
Analog Input	Analog Input Terminal 4	Vi4	Voltage input 4: 0 to 10V	Input impedance: 10k Ω (approximately) Allowable range of input: -0.3 to 12V
		Ii4	Current input 4: 0 to 20mA	Input impedance: 100 Ω (approximately) Allowable range of input: 0 to 24mA
	Analog Input 4 Switch	Si4	Select input 4: voltage or current	Shorted Si4 to L: Vi4 enabled(initial condition) Opened Si4: Ii4 enabled
	Analog Input Terminal 5	Vi5	Voltage input 5: 0 to 10V	Input impedance: 10k Ω (approximately) Allowable range of input: -0.3 to 12V
		Ii5	Current input 5: 0 to 20mA	Input impedance: 100 Ω (approximately) Allowable range of input: 0 to 24mA
	Analog Input 5 Switch	Si5	Select input 5: voltage or current	Shorted Si5 to L: Vi5 enabled(initial condition) Opened Si5: Ii5 enabled
Analog Output	Analog Input Terminal 6	Vi6	Voltage 6: -10 to 10V	Input impedance: 10k Ω (approximately), allowable range of input: -12 to 12V
	Analog Output Terminal 3	Vo3	Voltage output 3: 0 to 10V	Maximum output current: 2mA Allowable range: 0 to 10V($\pm 10\%$ accuracy)
		Io3	Current output 3: 0 to 20mA	Allowable load impedance: 250 Ω or less Allowable range : 0 to 20mA($\pm 20\%$ accuracy)
	Analog Output 3 Switch	So3	Select output 3: voltage or current	Shorted So3 to L: Vo3 enabled(initial condition) Opened So3: Io3 enabled
	Analog Output Terminal 4	Vo4	Voltage: 0 to 10V	Maximum output current: 2mA Allowable range: 0 to 10V($\pm 10\%$ accuracy)
		Io4	Current: 0 to 20mA	Allowable load impedance: 250 Ω or less Allowable range : 0 to 20mA($\pm 20\%$ accuracy)
	Analog Output 4 Switch	So4	Select output 4: voltage or current	Shorted So4 to L: Vo4 enabled(initial condition) Opened So4: Io4 enabled
	Analog Output Terminal 5	Vo5	Voltage output 5: -10 to 10V	Maximum output current: ± 2 mA Allowable range: -10 to 10V($\pm 10\%$ accuracy)
Input/Output Common		L	Reference potential(signal ground)	
Functional Ground		FG	Connect to the functional ground (the screw size: M3)	

It cannot work the following terminal combinations simultaneously.

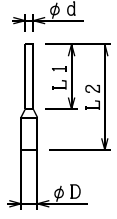
- Combination of Vi4 and Ii4 terminal : Combination of Vi5 and Ii5 terminal

Besides, redundant terminals need to be opened, do not wire or connect them.

- Combination of Vo3 and Io3 terminal : Combination of Vo4 and Io4 terminal

■ Recommendation terminals

In order to make convenience to wiring and improve the connection, it's recommended to use the ferrule terminals with the following specifications for signal wire.

Wire diameter [mm ²] (AWG)	Ferrule terminal model *1)	L1[mm]	L2[mm]	φ d[mm]	φ D[mm]	
0.25 (24)	AI 0,25-10 YE	10.0	14.5	0.8	2.0	
0.34 (22)	AI 0,34-10 TQ	10.0	14.5	0.8	2.0	
0.5 (20)	AI 0,5-10 WH	10.0	16.0	1.1	2.5	
0.75 (18)	AI 0,75-10 GY	10.0	16.0	1.3	3.4	

*1) Manufacturer:

PHOENIX CONTACT GmbH & Co. KG

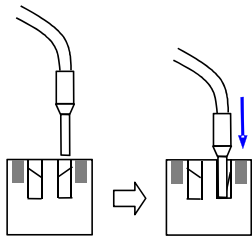
Crimping tool: CRIMPFOX® 6

Note that these specifications are different from the recommended ferrule terminals for the inverter.

■ Wiring

Inserting the wire:

- ① Inserting the ferrule terminal into the P1-AG connector. It will be easy to insert without any tools if use the recommendation ferrule terminals. *2)

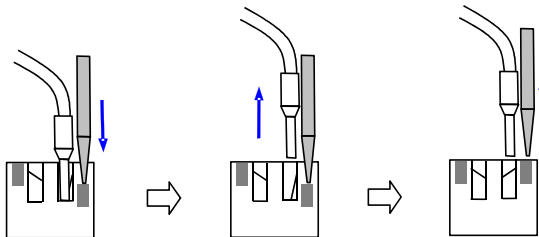


Inserting wire

*2) In case not using the recommendation ferrule terminal, please insert it with a flat head screwdriver in the reverse order of removal method.

Pulling out the wire:

- ① Pressing the grey part *3) on P1-AG connector with flat screwdriver (width 2.5mm or less) to open the wire port.
② Pulling out the wire or the ferrule terminal while pressing the flat screwdriver.
③ Pulling out the flat screwdriver.



Pressing the grey part *3) with flat screwdriver

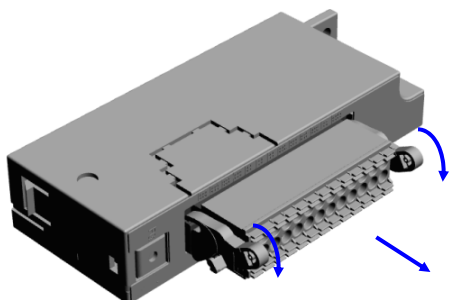
Pulling out the wire or the ferrule terminal

Pulling out the flat screwdriver

*3) It is orange of the actual color that grey part on the connector.

■ Detaching the connector

Pulling down the latch lever in the arrow direction as shown below, then pulling out the connector.



Pulling down the latch lever

Pulling out the connector

6

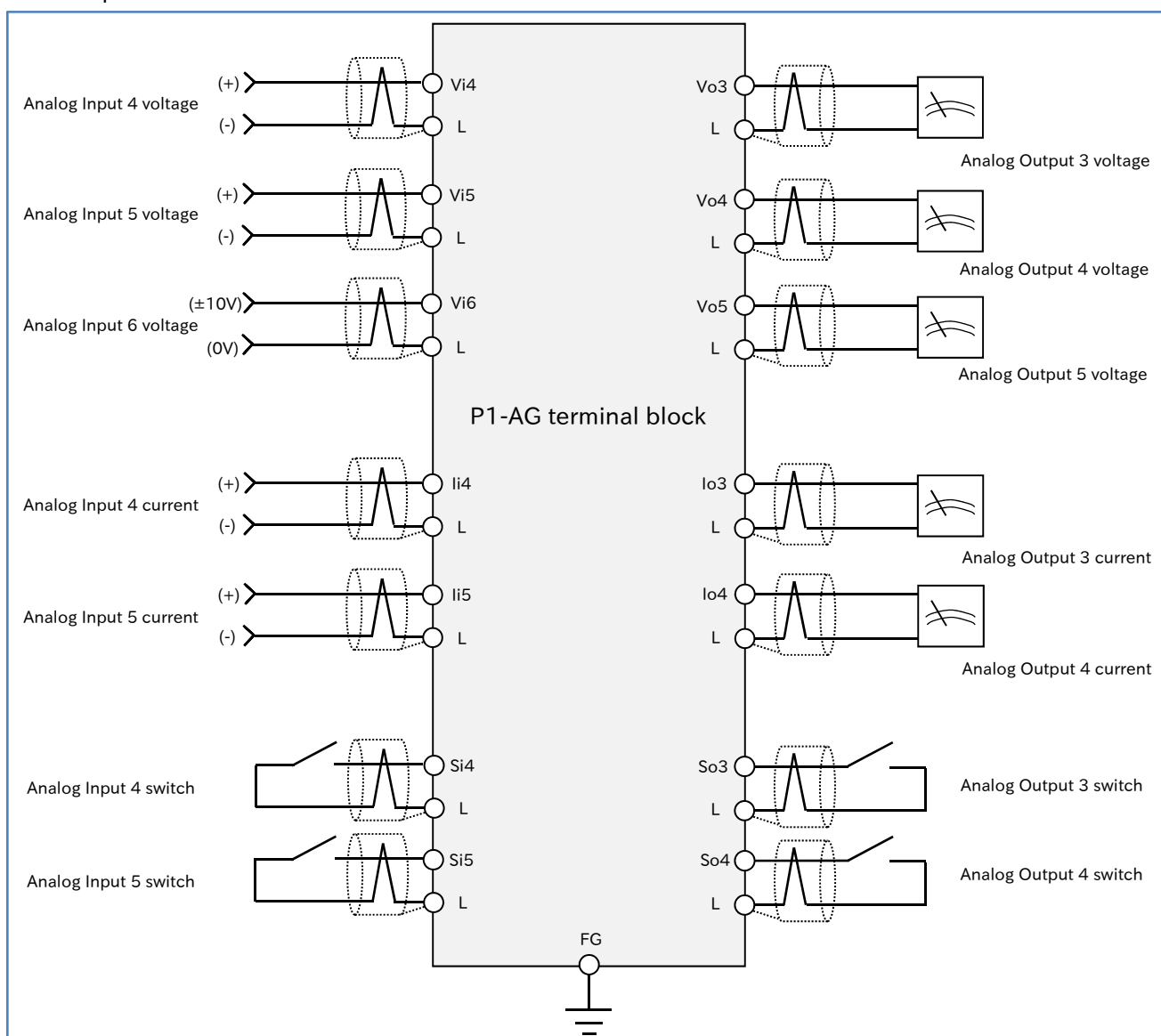
Chapter 6 Function of Analog Input/Output

6.1 About this chapter

This chapter contains the information about the inverter setting parameters related to this product.

6.2 Terminal connection

An example of terminal connection of P1-AG is as follows.



- Wiring the P1-AG, make sure that use the twisted pair cable with shield. In case of improper wiring, the inverter may malfunction caused by external noise. Make sure that the shield is wired to L terminal or Ground terminal of the inverter. Additionally, do not be multipoint ground.
- Make sure that length of wiring to P1-AG must be 20 m or less. In case the length is more than 20 m, the inverter may malfunction caused by external noise.
- Make sure of wiring the FG terminal to functional ground.

6.3 List of parameters related to the P1-AG

The following table shows the inverter setting parameters related to this product. For information about actual usage, please refer to the HF-430NEO User's guide.

■ Parameter

Code	Parameter name
dA-60	Analog input/output status monitor
dA-64	Analog input [Ai4] monitor
dA-65	Analog input [Ai5] monitor
dA-66	Analog input [Ai6] monitor
dA-81	Option slot-1 status
dA-82	Option slot-2 status
dA-83	Option slot-3 status
db-21	Reserved
db-22	
db-23	
AA101	Main speed input source selection, 1st-motor
AA201	Main speed input source selection, 2nd-motor
AA102	Sub speed input source selection, 1st-motor
AA202	Sub speed input source selection, 2nd-motor
Ad-01	Torque reference input source selection
Ad-11	Torque bias input source selection
Ad-40	Speed limit input source selection at torque control
AH-07	PID1 set-point 1 input source selection
AH-42	PID1 set-point 2 input source selection
AH-46	PID1 set-point 3 input source selection
AH-51	PID1 feedback 1 input source selection
AH-52	PID1 feedback 2 input source selection
AH-53	PID1 feedback 3 input source selection
AH-70	PID1 feed-forward input source selection
AJ-07	PID2 set-point input source selection
AJ-12	PID2 feedback input source selection
AJ-27	PID3 set-point input source selection
AJ-32	PID3 feedback input source selection
AJ-47	PID4 set-point input source selection
AJ-52	PID4 feedback input source selection
bA101	Upper frequency limit source selection, 1st-motor
bA201	Upper frequency limit source selection, 2nd-motor
bA110	Torque limit selection, 1st-motor
bA210	Torque limit selection, 2nd-motor
CA-70	Speed command selection when [F-OP] is active.
CC-01	Output terminal [UPF] function
CC-02	Output terminal [DRV] function
CC-03	Output terminal [X1] function
CC-04	Output terminal [X2] function
CC-05	Output terminal [X3] function
CC-06	Output terminal [RL] function
CC-07	Output terminal [FL] function
oA-10	Operation selection at an option error (SLOT-1)
oA-20	Operation selection at an option error (SLOT-2)
oA-30	Operation selection at an option error (SLOT-3)
oE-01	[Ai4] Filter time constant
oE-03	[Ai4] Start value
oE-04	[Ai4] End value
oE-05	[Ai4] Start rate
oE-06	[Ai4] End rate
oE-07	[Ai4] Start point selection
oE-11	[Ai5] Filter time constant
oE-13	[Ai5] Start value

Code	Parameter name
oE-14	[Ai5] End value
oE-15	[Ai5] Start rate
oE-16	[Ai5] End rate
oE-17	[Ai5] Start point selection
oE-21	[Ai6] Filter time constant
oE-23	[Ai6] Start value
oE-24	[Ai6] End value
oE-25	[Ai6] Start rate
oE-26	[Ai6] End rate
oE-28	[Ai4] Voltage/Current bias adjustment
oE-29	[Ai4] Voltage/Current gain adjustment
oE-30	[Ai5] Voltage/Current bias adjustment
oE-31	[Ai5] Voltage/Current gain adjustment
oE-32	[Ai6] Voltage bias adjustment
oE-33	[Ai6] Voltage gain adjustment
oE-35	[Ai4] Window comparator upper limit
oE-36	[Ai4] Window comparator lower limit
oE-37	[Ai4] Window comparator hysteresis width
oE-38	[Ai5] Window comparator upper limit
oE-39	[Ai5] Window comparator lower limit
oE-40	[Ai5] Window comparator hysteresis width
oE-41	[Ai6] Window comparator upper limit
oE-42	[Ai6] Window comparator lower limit
oE-43	[Ai6] Window comparator hysteresis width
oE-44	[Ai4] Operation level at disconnection
oE-45	[Ai4] Operation level selection at disconnection
oE-46	[Ai5] Operation level at disconnection
oE-47	[Ai5] Operation level selection at disconnection
oE-48	[Ai6] Operation level at disconnection
oE-49	[Ai6] Operation level selection at disconnection
oE-50	[Ao3] Output monitor selection
oE-51	[Ao4] Output monitor selection
oE-52	[Ao5] Output monitor selection
oE-56	[Ao3] Output filter time constant
oE-57	[Ao3] Data type selection
oE-58	[Ao3] Bias adjustment
oE-59	[Ao3] Gain adjustment
oE-60	Adjustment mode [Ao3] output level
oE-61	[Ao4] Output filter time constant
oE-62	[Ao4] Data type selection
oE-63	[Ao4] Bias adjustment
oE-64	[Ao4] Gain adjustment
oE-65	Adjustment mode [Ao4] output level
oE-66	[Ao5] Output filter time constant
oE-67	[Ao5] Data type selection
oE-68	[Ao5] Bias adjustment
oE-69	[Ao5] Gain adjustment
oE-70	Adjustment mode [Ao5] output level
PA-22	Output selection for the current monitor
PA-24	Output selection for the DC voltage monitor
PA-26	Output selection for the output voltage monitor
PA-28	Output selection for the torque monitor
PA-30	Output selection for the frequency matching

7

Chapter 7 Troubleshooting

7.1 About this chapter

This chapter contains the troubleshooting of cases such as errors detected by the protection function, warnings given by the warning function, or some cases in which the device is not working properly.

When the device is not working properly or there is any trouble, read this chapter before trying to solve the problem. Use the following sections as a reference when dealing with these situations.

7.2 Self-diagnosis

The inverter tripped.



It is displaying an error. → Refer to this guide page 7-1 「7.3 Inverter troubleshooting」



Please contact your supplier.

Before contacting the technical service, please confirm the items on the right.

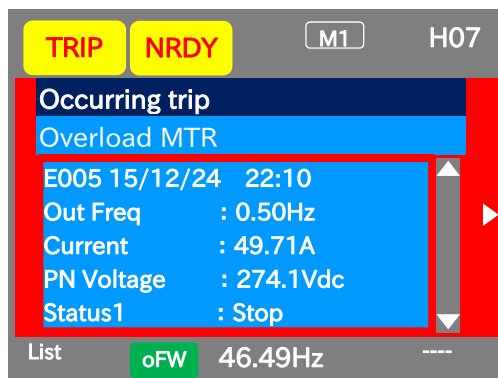
- (1) Inverter model,
- (2) Inverter manufacture number (MFG No.)
- (3) Option device model (P1-AG)
- (4) P1-AG manufacture number (MFG No.)
- (5) Date of purchase
- (6) Inquiry contents

For information about how to check the (1) and (2) refer to the HF-430NEO user's guide.

For information about how to check the (3) and (4) refer to the chapter 3 in this guide.

7.3 Inverter troubleshooting

In case the some error was detected by the inverter, it stops the motor (trip) and gives a notice with the respective error code. When the trip occurs, the inverter display shows following screen.



The number of E005 in the above is an error code. Abnormality related to this device and its solutions are shown the following.

■ Abnormality and its solutions related with this product.

E060 / E069

Option 1 Error 0 / 9

E070 / E079

Option 2 Error 0 / 9

E080 / E089

Option 3 Error 0 / 9

When a communication error occurring between the P1-AG and the inverter, the inverter trips with those codes.

In case the communication error detected by the P1-AG, "E060, E070, or E080" is shown as the error code. Additionally, in case the communication error detected by the inverter, "E069, E079, or E089" is shown as the error code.

Those error codes "E06*", E07*", or E08*" depend on the slot in which the P1-AG is attached.

Issue▶	Possible cause▶	Possible solution
An error occurred in the communication between the P1-AG and the inverter.	<ul style="list-style-type: none"> • The P1-AG is not correctly attached. 	<ul style="list-style-type: none"> • Refer to the chapter 5.3 "Installation", attach the P1-AG again.
	<ul style="list-style-type: none"> • There is an intruding object in between the P1-AG and the inverter connector. 	<ul style="list-style-type: none"> • Remove the intruding object.

E068 Option 1 Error 8

E078 Option 2 Error 8

E088 Option 3 Error 8

In case the P1-AG is attached to the unsupported inverter, "E068, E078, or E088" is shown as the error code.

Those error codes "E06*", E07*", or E08*" depend on the slot in which the P1-AG is attached.

Issue▶	Possible cause▶	Possible solution
An error occurred as soon as the inverter powered on.	<ul style="list-style-type: none"> • The P1-AG is attached to the unsupported inverter. 	<ul style="list-style-type: none"> • Refer to the chapter 5.2 "Supported inverters", attach the P1-AG to the supported inverter.

7.4 Any other troubles

In case the P1-AG does not work properly without any error codes of the inverter, refer to the following solutions.

Issue▶	Possible cause▶	Possible solution
The function of analog input/output does not work properly.	• The P1-AG is not correctly attached.	• When a communication error occurring between the P1-AG and the inverter, the P1-AG outputs 0V or 0mA in analog output terminals. Refer to the chapter 5.3 "Installation", attach the P1-AG again.
	• There is something wrong with the wiring.	• Refer to the chapter 5.4 "Terminal Block and Wiring", wire the P1-AG again.

8

Chapter 8 Specifications

8.1 About this chapter

This chapter contains information about the P1-AG specifications.

8.2 Device specifications

■ Specifications

Item		Specification	
Model		P1-AG	
Weight		170 g	
Environment	Ambient operating temperature	-10 to 50℃	No icing or condensation conditions.
	Ambient operating humidity	20 to 90%RH	
	Storage temperature *1)	-20 to 65℃	
	Vibration resistance	5.9 m/s2(0.6G), 10 to 55 Hz	
	Conformance to EMC and electrical safety standards	IEC/EN61800-3 Second environment, Category C3 IEC/EN61800-5-1 SELV	
	Enclosure rating	IP00	
Interface	Analog input	-10 to 10 V voltage input: 1 terminal	
		0 to 10 V voltage input: 2 terminals	
		0 to 20 mA current input: 2 terminals	
	Analog output	-10 to 10 V voltage output: one terminal	
		0 to 10 V voltage output: 2 terminals	
		0 to 20 mA current output: 2 terminals	
Analog input/output switch	0 to 10 V voltage/0 to 20 mA current input: 2 terminals 0 to 10 V voltage/0 to 20 mA current output: 2 terminals		
Analog ground common	Reference potential(signal ground): 12 terminals		

*1) "Storage temperature" is the temperature during transportation.

When handling analog input/output signals, you need to use appropriate power supply for P1-AG and its peripherals.

Warranty

Warranty period	The warranty shall be 18 months from date of shipment or 12 months after initial operation, whichever is shorter.
Warranty condition	<p>In the event that any problem or damage to the Product arises during the "Warranty Period" from defects in the Product whenever the Product is properly installed and combined with the Buyer's equipment or machines maintained as specified in the maintenance manual, and properly operated under the conditions described in the catalog or as otherwise agreed upon in writing between the Seller and Buyer or its customers; the Seller will provide, at its sole discretion, appropriate repair or replacement of the Product without charge at a designated facility, except as stipulated in the "Warranty Exclusions" as described below.</p> <p>However, if the Product is installed or integrated into the Buyer's equipment or machines, the Seller shall not reimburse the cost of: removal or re-installation of the Product or other incidental costs related thereto, any lost opportunity, any profit loss or other incidental or consequential losses or damages incurred by the Buyer or its customers.</p>
Warranty exclusion	<p>Notwithstanding the above warranty, the warranty as set forth herein shall not apply to any problem or damage to the Product that is caused by:</p> <ol style="list-style-type: none"> 1. Installation, connection, combination or integration of the Product in or to the other equipment or machine that rendered by any person or entity other than the Seller. 2. Insufficient maintenance or improper operation by the Buyer or its customers such that the Product is not maintained in accordance with the maintenance manual provided or designated by the Seller; 3. Improper use or operation of the Product by the Buyer or its customers that is not informed to the Seller, including, without limitation, the Buyer's or its customers' operation of the Product not in conformity with the specifications; 4. Any problem or damage on any equipment or machine to which the Product is installed, connected or combined or any specifications particular to the buyer or its customers; 5. Any changes, modifications, improvements or alterations to the Product or those functions that are rendered on the Product by any person or entity other than the Seller; 6. Any parts in the Product that are supplied or designated by the Buyer or its customers; 7. Earthquake, fire, flood, salt air, gas, lightning, acts of God or any other reasons beyond the control of the Seller; 8. Normal wear and tear, or deterioration of the Product's parts, such as the cooling fan bearings; 9. Any other troubles, problems or damage to the Product that are not attributable to the Seller.
Others	The Seller will not be responsibility for the installation and removal of the inverter. Any inverter transportation cost shall be born by both Seller and Buyer.

Worldwide Locations

U.S.A

Sumitomo Machinery Corporation of America (SMA)
1453 Cornwall Blvd. Chesapeake, VA 23323, U.S.A.
TEL (1)757-485-3355 FAX (1)757-485-7490

Canada

SM Cyclo of Canada, Ltd. (SMC)
1453 Cornwall Road, Oakville, Canada ON L6J 7T5
TEL (1)905-469-1050 FAX (1)905-469-1055

Mexico

SM Cyclo de Mexico, S.A. de C.V. (SMME)
Av. Desarrollo 541, Col. Finsa, Guadalupe,
Nuevo León, México, CP67132
TEL (52)81-8144-5130 FAX (52)81-8144-5130

Brazil

Sumitomo Industrias Pesadas do Brasil Ltda. (SHIB)
Rodovia do Acucar (SP-075) Km 26
Itu, Sao Paulo, Brasil
TEL (55)11-4886-1000 FAX (55)11-4886-1000

Chile

SM-Cyclo de Chile Ltda. (SMCH)
Camino Lo Echevers 550, Bodegas 5 y 6,
Quilicura, Región Metropolitana, Chile
TEL (56)2-892-7000 FAX (56)2-892-7001

Argentina

SM-Cyclo de Argentina S.A. (SMAR)
Ing Delpini 2230, B1615KGB Grand Bourg,
Malvinas Argentinas, Buenos Aires, Argentina
TEL (54)3327-45-4095 FAX (54)3327-45-4099

Guatemala

SM Cyclo de Guatemala Ensambladora, Ltda. (SMGT)
Parque Industrial Unisur, 0 Calle B 19-50 Zona 3,
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TEL (502)6648-0500 FAX (502)6631-9171

Colombia

SM Cyclo Colombia, S.A.S. (SMCO)
Parque Industrial Celta, Km 7.0 Autopista Medellín,
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TEL (57)1-826-9766

Peru

SM Cyclo de Perú, S.A.C (SMPE)
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Specifications, dimensions, and other items are subject to change without prior notice.



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No.DM3412E-1.0

EA10 Printed 2020.03