Sumitomo Drive Technologies

HF-430NEO Series

Screw type terminal option
Model : HF-TM2

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.

Introduction

Thank you for purchasing the HF-TM2: Screw type terminal option for HF-430NEO series inverter.
This instruction manual describes how to handle and maintain the HF-TM2. Please read this manual carefully before using the HF-TM2, 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 HF-TM2 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 HF-TM2 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 HF-TM2 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 HF-TM2 User's Guide.

■Precautions

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 HF-TM2 User's Guide is not covered by the product warranty.
Please DO NOT perform any procedure NOT described on the HF-430NEO or the HF-TM2 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 HF-TM2 User's Guide. We appreciate your understanding.
Note that, in case the HF-430NEO Instruction manual and User's Guide, the HF-TM2 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.

Table of Contents

Chapter 1 Safety Precautions

1

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 itsinformation.

Symbol definition

<table>
<tr><td rowspan="3">  </td><td colspan="2">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.</td></tr>
<tr><td>  </td><td>This symbol indicates “General hazard not specified, be cautious”.</td></tr>
<tr><td>  </td><td>This symbol indicates “Electric shock hazard”.</td></tr>
<tr><td>  </td><td colspan="2">This symbol indicates prohibited actions “Actions that should not be done” when handling this device.</td></tr>
<tr><td>  </td><td colspan="2">This symbol indicates actions that must be done based on the instructions.</td></tr>
</table>

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

● Risk of an electric shock and/or fire!

Electric shock and Fire hazard
- 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. Note:

Do

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

Note: 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.

● Risk of inverter failure!

Failure

Prohibited
- DO NOT pull any wire after wiring.
- Be sure to operate the switch of HF-TM2 after power off.
- Be sure to fix on the wiring and avoid extra burden to the connector and terminal.

● **Risk of an electric shock and/or fire!**

・Perform the wiring only after installing the inverter.

Warning

● **Risk of Fire!**

・Tighten each screw to the specified torque.
・No screw must be left loose.

・Make sure that the inverter and HF-TM2 are fixed together with the securing screw.
・Make sure that the connector is properly fixed.

● **Risk of an electric shock and injury!**

・Be sure to operate the switch of HF-TM2 after power off.
・Be sure to handle the cables properly and do not let them get damaged.
・Be sure to fix on the wiring, and avoid extra burden to the connector and terminal.

1.4.4 Precautions during operation and trial operation!

Danger

● **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 sick or rod like objects inside this device while it is energized.

● **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!**

・Be sure to screw HF-TM2 before turning on the inverter power.
・Do not disconnect HF-TM2 while power is being supplied to the inverter or voltage remains inside.

・Do not operate switches with wet hands.

Warning

● **Risk of injury and damage to machine**

・The inverter easily allows you to control the speed of operating motor.
Confirm the capacity and ratings of the motor or machine before operating.

・When you run the motor at a high frequency, check and confirm to each manufactures of a permitting revolution of the respective motor and machine.
・Check the rotate motor direction, abnormal sound, and vibrations while operating.

1.4.5 Precautions during Maintenance/ Inspection!

Danger

● **Risk of an electric shock!**

・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. Note:

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

・Commit only a designated person to maintenance, inspection, and the replacement of parts.

(Be sure to remove wristwatches and metal accessories, e.g., bracelets, before maintenance and inspection work and to use insulated tools for the work.)

Note: 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!**

・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.

・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

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

・DO NOT modify HF-TM2.

Note: 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.

Chapter 2 Overview

2

2.1 About this chapter

This chapter includes explanations of applicable products, knowledge required for reading the guide, those who should read the guide, and the purpose, overview and glossary of the Guide

2.2 Applicable devices

The contents of this guide are applicable to HF-TM2. Refer to the corresponding instruction guides for other products and optional parts.

2.3 Before reading this guide

The Guide is meant to be read by those who have knowledge of electricity (certified electrician or equivalent) and those who are in charge of introduction, installation or connection of control equipment, system design and workplace management. This guide is written in SI units.

2.4 Guide objectives

The Guide is meant to provide necessary information for the following:

- Installation and wiring of the product;
- Parameter setting;

2.5 Guide outline

The guide consists of the following chapters:

- **Safety Precautions (Chapter 1)** includes safety instructions for installation, wiring, operation, maintenance and inspection the product.
- **Overview (Chapter 2)** includes explanation of those who should read the guide and purpose of the guide.
- **Enclosed Items (Chapter 3)** explains items included in the product package.
- **Installation and Wiring (Chapter 4)** explains how to install and wire the product.
- **Precaution for using HF-TM2 (Chapter 5)** includes the information about the specific precaution and the affected parameters at using HF-TM2.

Chapter 3 Enclosed Items

3

3.1 About this chapter

This chapter describes bundled items that need to be checked upon purchase.

3.2 About the enclosed items

The following items are included in the package.

HF-TM2 x1

User's guide x1

3.3 Verification after the purchase

- 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 HF-TM2,
there is a User's Guides,
when unpacking.

Chapter 4 Installation and Wiring

4

4.1 About this chapter

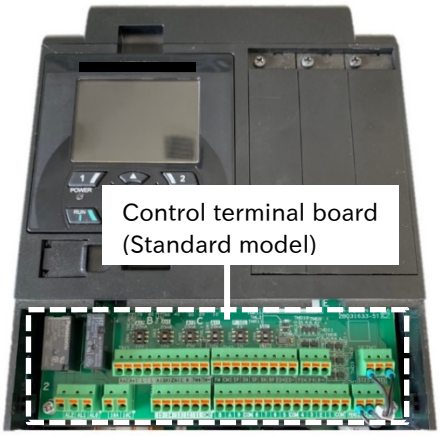
This chapter describes installation of HF-TM2 and wiring to HF-TM2.

4.2 Installation of HF-TM2

Installation procedure

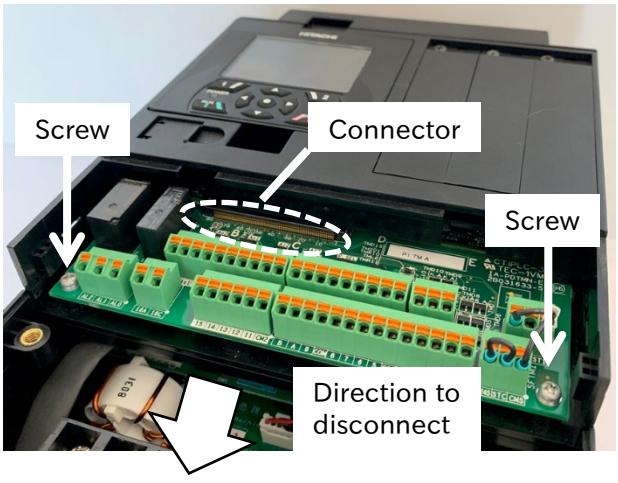
① Remove the terminal cover of HF-430NEO and confirm the control terminal like the following picture (Fig. 1). Regarding the detail, they are written in user’ s guide of HF-430NEO.

Fig. 1



② Remove the 2 screws and disconnect the connector between standard control terminal board and logic board to the direction of the arrow (Fig.2).

Fig. 2

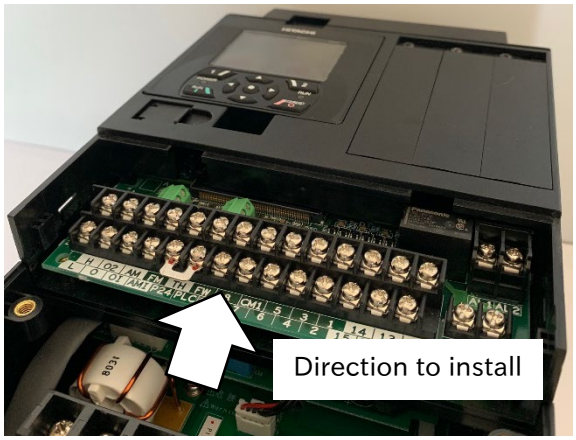


③ The following picture (Fig. 3) shows the terminal space after removing the standard control terminal board.

Fig.3

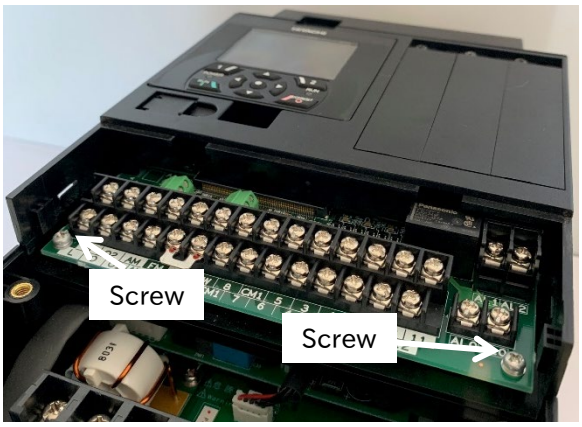
④ Align the connector of logic board with the connector of HF-TM2.
And then connect HF-TM2 to the direction of the arrow (Fig.4).

Fig.4



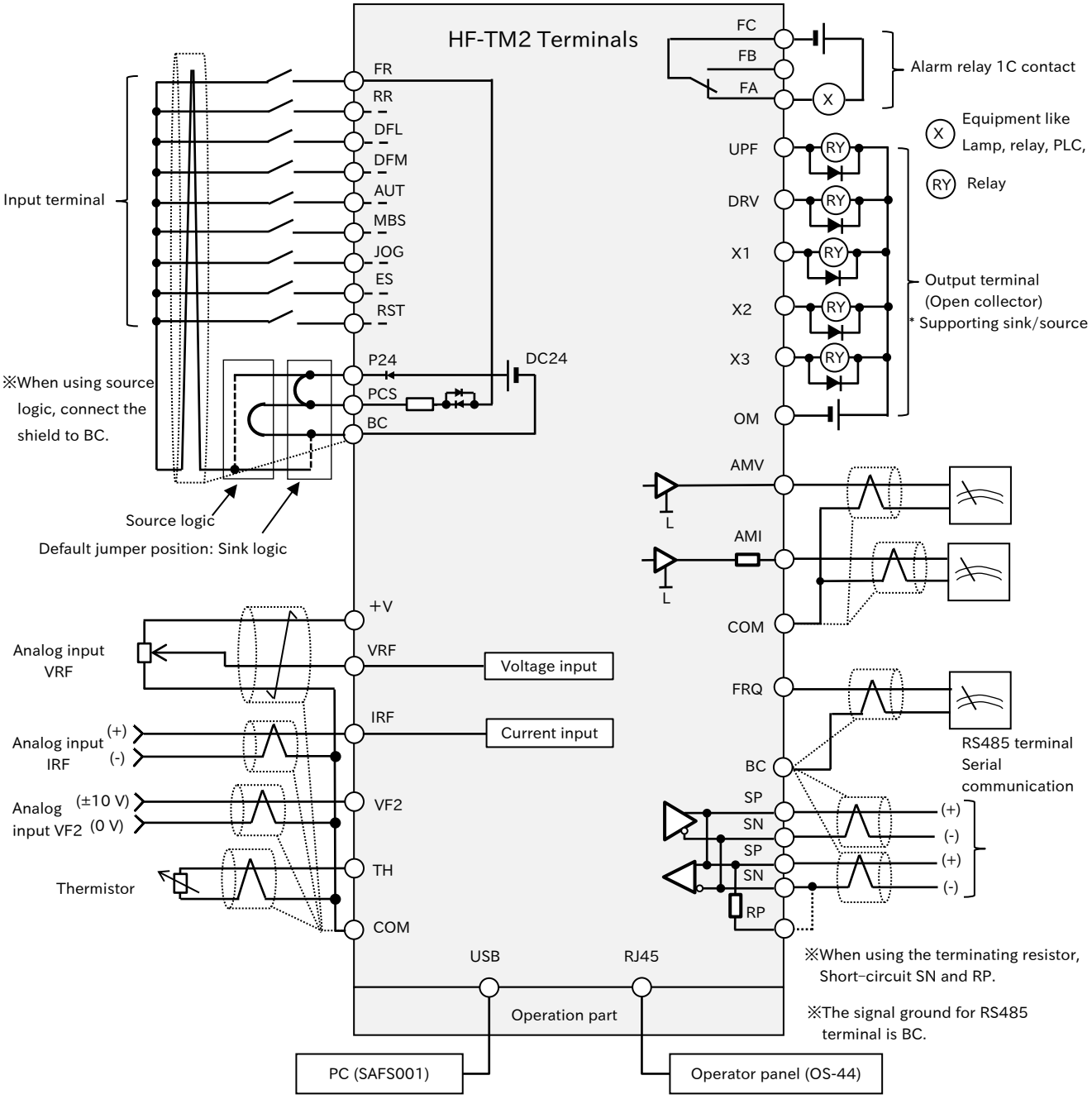
⑤ Fix HF-TM2 with the 2 screws.

Fig.5



4.3 Wiring of HF-TM2

■Outline of control circuit



Precaution at wiring to HF-TM2

- COM and BC are common terminals for input and output signals, and they are insulated from one another.
  Do not make these common terminals shorted or grounded.
- Do not make them grounded via an external device.

- Separate the wiring to HF-TM2 from that of the main circuit line (power line) or relay control circuit. If it is unavoidable to do so, make them positioned at right angles to each other. Otherwise, the inverter may malfunction.
- Although the control circuit terminal block has two lines, you can easily perform wiring by starting from the lower terminals. Make setting to perform wiring from the lower area.

- When wiring between analog inputs, make sure to check that they are at the desired input (voltage or current).
- Input of erroneous voltage or current caused by input of a value outside the specification range (using P24 terminal (24V) instead of +V terminal (10V)), incorrect wiring (wires are installed in reverse orientation and input of voltage/current is reversed, short circuit occurs between +V and COM, wiring of a knob causes short circuit between +V and COM at 0Ω, etc.) may cause failure.

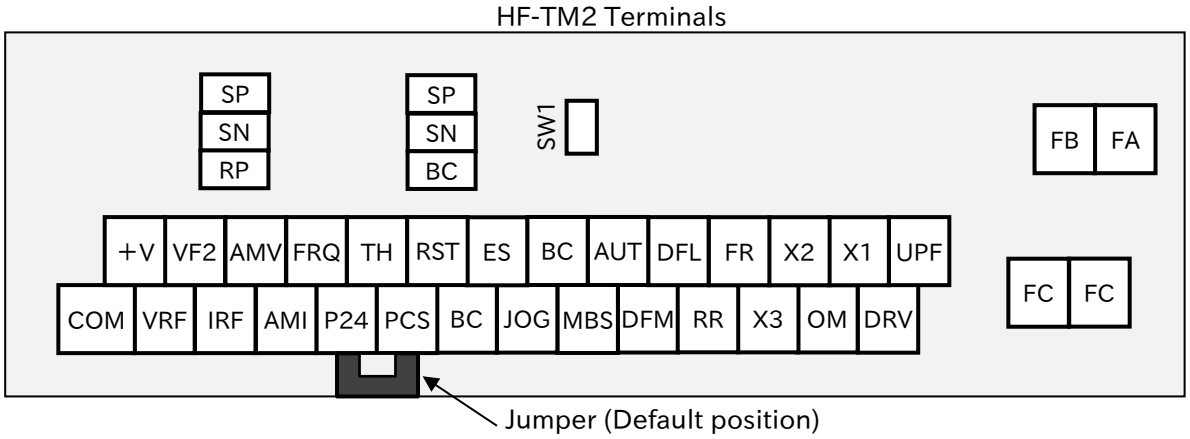
- For wiring to the control circuit terminal block, use twisted shield wires (Recommended diameter is 0.75mm^2), and connect the shield films to each common terminal.
  Recommended tightening torque is 0.5 to 0.7 N·m (for M3 screw terminal) or 0.22 to 0.25 N·m (for spring clamp terminal).

- The wiring length to HF-TM2 shall be within 20m. If the connecting wire exceeds 20m, you may not be able to get sufficient characteristics due to effects of voltage drop.
  If it is unavoidable to set the length to more than 20m, use an insulation signal converter or etc., and check that there is no problem with operation.

- After wiring, lightly pull the wires to check that wires are securely connected.

- For output terminals and relay output terminals, install a diode for preventing counter-electromotive force.
  Otherwise, counter-electromotive force is applied, which may cause failure.

4.4 HF-TM2 Terminal arrangement



Logic of input terminals

In the factory setting, the logic for input terminals is the sink logic.
To switch the input control logic to the source logic, remove the jumper connecting terminals P24 and PCS on the control circuit block, and then connect terminals PCS and BC with the jumper.

■Input terminals (M3 screw terminal)

- Regarding to the default setting of parameters for each terminal function, refer to the user's guide for HF-430NEO.
- Refer to "4.3 Wiring of HF-TM2" as wiring sample.
- All of terminal "CM1" has same electrical potential.
- The logic for input terminals (Sink/Source) can be switched by the connection of the jumper.

			Terminal symbol	Terminal name	Description	Electric characteristics
Input terminal	Digital input	Contact	FR, RR DFL,DFH AUT,MBS JOG,ES RST	Input terminal	Each terminal can select input terminal functions by parameter setting. Switch the connection of jumper to select the sink logic and source logic.	Voltage across input and PLC: •ON Voltage Min. 18 VDC •OFF Voltage Max. 3 VDC •Max. allowable voltage 27 VDC •Load current 5.6 mA(at 27 VDC)
		Power supply	P24	24 VDC output power supply terminal	24 VDC power supply for contact signal. When using source logic, "P24" terminal become common terminal for input contact.	100 mA output at maximum
			BC	Common for 24 VDC output power supply terminal	This is a common terminal for power terminal "P24" and digital input terminal "FR, RR, DFL, DFM, AUT, MBS, JOG, ES, RST". When using sink logic, "BC" become common terminal for input contact. There are two "BC" terminals.	-
			PCS	Common for Input terminal	Switch the connection of jumper to select the sink logic and source logic. Short circuit P24-PCS: Sink logic Short circuit BC-PCS: Source logic When using external power supply for contact input, remove the jumper and connect "PCS" terminal with external interface.	-

- Regarding to the default setting of parameters for each terminal function, refer to the user's guide for HF-430NEO.
- Refer to "4.3 Wiring of HF-TM2" as wiring sample.

■Output terminals (M3 screw terminal)

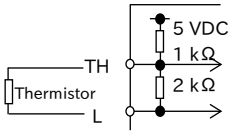
			Terminal symbol	Terminal name	Description	Electrical characteristics
Output terminal	Digital output	Open Collector	UPF DRV X1 X2, X3	Output terminal	Terminal functions are selectable according to the parameter settings for each terminal. These are available for both sink and source logics.	Open collector output • Between each terminal and OM • Voltage drop at ON: 4 V or less • Max allowable voltage: 27 VDC • Max allowable current: 50 mA
			OM	Common for output terminal	This is a common terminal for output terminals UPF to X3.	-
		Relay	FA FB FC	1c relay terminal	Relay terminals for C contact output	Maximum contact capacity FB/FC : ・250 VAC, 2 A (resistance) ・250 VAC, 0.2 A (inductive load) ・30 VDC, 2 A FA/FC : ・250 VAC, 1 A (resistance) ・250 VAC, 0.2 A(inductive load) ・30 VDC, 1 A Minimum contact capacity(common) ・100 VAC, 10 mA/ 5 VDC ,100 mA

■Analog input/output (M3 screw terminal)

		Terminal symbol	Terminal name	Description	Electrical characteristics
Analog input/output	Power supply	COM	Common for analog power supply	Common terminals for analog input terminals (VRF, IRF, VF2), analog output terminals (AMV, AMI) and thermistor terminal (TH).	-
		+V	Speed setting power supply	This is a 10 VDC power supply. It is used when using analog input terminals (VRF, VF2) and variable resistor for inputting voltage.	Allowable load current: 20 mA
	Analog input	VRF	Analog input terminal VRF	0 to 10 VDC voltage input can be used. It can be used for input frequency command or feedback.	• Input impedance: about 10 kΩ • Allowable input voltage: -0.3 to 12 VDC
		IRF	Analog input terminal IRF	0 to 20 mA current input can be used. It can be used for input frequency command or feedback.	• Input impedance: about 100 Ω • Allowable input current:24 mA
		VF2	Analog input terminal VF2	-10 to 10 VDC voltage input can be used. It can be used for input frequency command or feedback.	• Input impedance: about 10 kΩ • Allowable input voltage: -12 to 12 VDC
	Analog output	AMV	Analog output terminal AMV	0 to 10 VDC voltage output can be used as output of information monitor data of the inverter.	• Allowable output current: 2 mA • Output voltage accuracy: ±10 % (ambient temp. :25℃±10 ℃)
		AMI	Analog output terminal AMI	0 to 20 mA current output can be used as output of information monitor data of the inverter.	• Allowable load impedance: 250 Ω or less • Output current accuracy: ±20 % (ambient temp. :25℃±10 ℃)

- Regarding to the default setting of parameters for each terminal function, refer to the user's guide for HF-430NEO.
- Refer to "4.3 Wiring of HF-TM2" as wiring sample.

■External Thermistor (M3 screw terminal)

		Terminal symbol	Terminal name	Description	Electrical characteristics
Thermistor terminal	Analog input	TH	External thermistor input	When an external thermistor is connected, and resistance abnormality occurs due to abnormal temperature, etc., trip the inverter. Connect the thermistor with TH+ and COM. The level of detecting resistance abnormality can be adjusted from 0 to 10000 Ω. [Recommended thermistor characteristics] Recommended product: SHIBAURA ELECTRONICS Co., Ltd. PB-41E Allowable rated power: 100 mW or more Impedance at abnormal temperature: 3 kΩ	0 to 5 VDC [Input circuit] 
		COM	Analog power common		

■FRQ output terminal (M3 screw terminal)

			Terminal symbol	Terminal name	Description	Electrical characteristics
FRQ outpour terminal	FRQ output	Monitor output	FRQ	Digital monitor (Voltage)	For digital monitor output, you can choose the PWM output method at 6.4 ms interval or pulse output method with about 50 % duty in which frequency varies.	Pulse train output 0 to 10 VDC • Maximum allowable current: 1.2 mA • Maximum frequency: 3.60 kHz
			BC	Common for digital monitor	This common terminal is for digital monitor. This terminal "BC" is combined with the base voltage (0 V) against "P24".	

- Regarding to the default setting of parameters for each terminal function, refer to the user's guide for HF-430NEO.
- Refer to "4.3 Wiring of HF-TM2" as wiring sample.

■Serial communication (Spring clamp terminal)

		Terminal symbol	Terminal name	Description	Electrical characteristics
RS485 communication	Serial communication	SP SN RP BC	RS-485 terminal for serial communication	SP terminal: RS-485 differential (+) signal SN terminal: RS-485 differential (-) signal RP terminal: Connect to SP via the terminating resistor BC terminal: Connect with the signal ground of an external communication device (also used by FRQ terminal). There are are two SP terminals and SN terminals each, which are connected internally. Maximum baud rate is 115.2 kbps.	Equipped with terminating resistor (120 Ω) Enable: Short RP-SN Disable: Open RP-SN

- Two SP terminals and SN terminals are connected internally, so it is available to use for multiple wiring.
- When using serial communication, refer to the user´s guide for HF-430NEO.
- The recommended wire for serial communication terminal is as below;
  Single wire: 0.14 to 1.5 mm^2
  Stranded wire: 0.14 to 1.0 mm^2
  Stranded wire with rod terminal: 0.25 to 0.5 mm^2
  Length of stripped wire: 5 mm
  Tightening torque: 0.22 to 0.25 N·m (M2 screw)

■Emergency stop function (disabled by the factory setting)

- The emergency stop function shuts off the inverter output in response to a command from a hardware circuit via an intelligent input terminal without the operation by internal CPU software. When using this function, refer to the user's guide for HF-430NEO.
- This function uses STO function of HF-430NEO , but functional safety certification become invalid. (SIL3, Cat.4)

Electric shock Injure

Prohibite

● **Risk of injury and electric shock!**

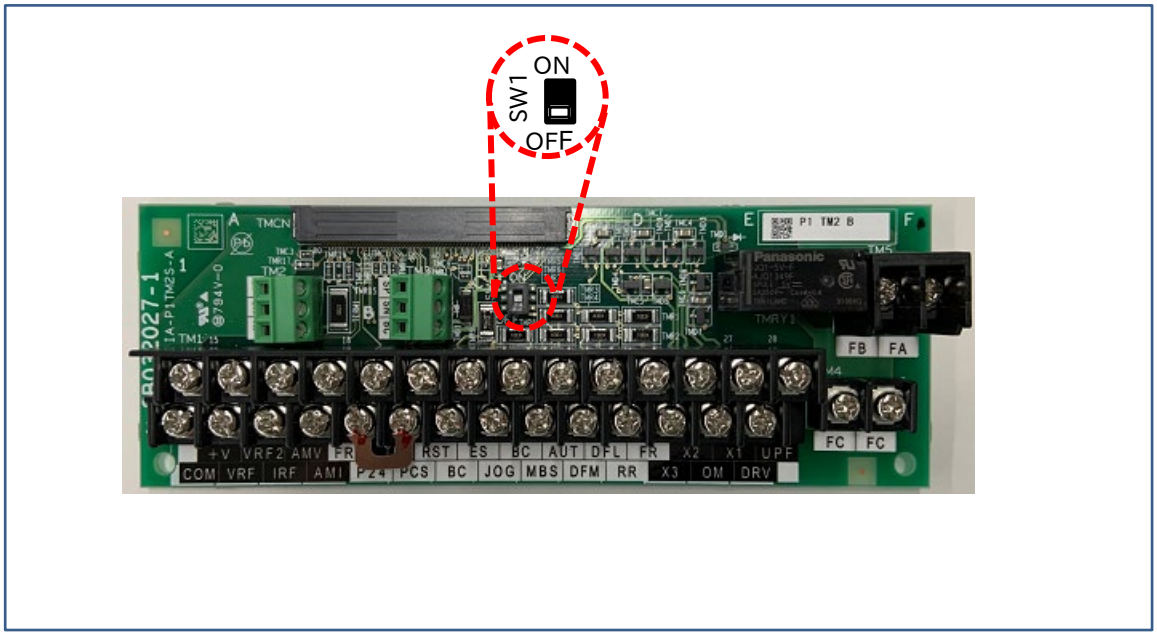
- This function does not shut off the power supply for main circuit and peripheral circuit. While power is supplied to the inverter, do not touch any terminals of the inverter or any power cables.

- When the emergency stop function is enabled, input terminal DFL is used exclusively for this function.
- Configure the input terminal [DFL] function (CA-03) to "no: 000 (Not use)".
- When input terminal DFL has other function, the inverter may malfunction.
- To enable this function, set the slide switch SW1 of HF-TM2 to ON.
  (With the factory setting, slide switch SW1 is set to OFF to disable the function)

Failure

Do

- If intelligent input terminal DFL is left unconnected, the cable connected to the terminal is disconnected, or the signal logic is improper, the inverter trips due to emergency stop.
- While power is supplied to the inverter, don't switch the slide switch due to prevention the inverter failure. Be sure to operate the switch of HF-TM2 after confirmation of turning off the power lamp on operator unit.



Chapter 5
Precaution for using HF-TM2

5

5.1 About this chapter

This chapter contains the information about the precautions at using HF-TM2 and the affected parameters.

5.2 Precaution for using HF-TM2

Table 1 Comparison between HF-430NEO standard terminal and HF-TM2

Function		Standard	HF-TM2	Note
Analog input		VRF	VRF	When using HF-TM2, switching between voltage and current is unavailable. Configure the parameters of each analog input/output terminal (VRF, IRF, VF2, AMV, and AMI) for adjustment of terminal functions.
		IRF	IRF	
		VRF2	VRF2	
Analog output		AMV	AMV	
		AMI	AMI	
Emergency stop	Terminal	ST1/ST2	DFL	This emergency stop function shuts off the inverter output in response to a command from a hardware circuit.
	SW1	-(Fixed)	On board	
	Reset	-	Optional	
External thermistor	+	TH+	TH	Please note that the common terminal is different between each device.
	- (Common)	TH-	COM	
RUN command	Terminal	FR	FR	Input terminal FR function is corresponding to FR terminal of HF-TM2. This terminal has forward rotation function as default.
	Configuration availability	Initial setting	available	
Pulse train input		DFH/DHH	-	-
Digital output		RL	-	-

Table 2 Invalid terminal functions of HF-430NEO when HF-TM2 is connected

Function		HF-430NEO	Note
Functional safety	Logic switching terminal	STC	Logic switching terminal and 24 V output power supply terminal for functional safety, and EDM (External Device Monitoring) are unavailable.
	24V output power supply terminal	P24S	
	EDM	ED+/-	
External power supply		PCS/P-	External power supply is unavailable.
Pulse train input		DFH/DHH	Pulse train input is unavailable.
1a relay terminal		RL	1a terminal relay is unavailable.

5.3 List of affected parameter modes

Some functions of terminals become invalid when HF-TM2 is connected. Please confirm the parameters.

Code	Function name	Difference
dA-51	Input terminal monitor	Terminal [DFH] and [DHH] are always “L”.
dA-54	Output terminal monitor	No actual output from terminal [RL]
dA-70	Pulse train input monitor (internal)	Always 0.00%
AA101	Main speed input source selection, 1st-motor	Don’t configure these parameters to “12 (Pulse train input (internal))” due to prevention the malfunction.
AA102	Sub speed input source selection, 1st-motor	
AA201	Main speed input source selection, 2nd-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	
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	
CA-70	Frequency reference selection when [F-OP] is active.	
CA-10	Input terminal [DFH] function	Don’t change these parameters due to prevention the malfunction.
CA-11	Input terminal [DHH] function	
CA-30	Input terminal [DFH] a/b(NO/NC) selection	
CA-31	Input terminal [DHH] a/b(NO/NC) selection	
CA-50	Input terminal [DFH] response time	Because there are no terminal for using these functions, these parameters become invalid.
CA-51	Input terminal [DHH] response time	
CA-81	Encoder constant setting	
CA-82	Encoder phase sequence selection	
CA-83	Motor gear ratio numerator	
CA-84	Motor gear ratio denominator	
CA-90	Pulse train input, target function selection	
CA-91	Pulse train input mode selection	
CA-92	Pulse train frequency scale	
CA-93	Pulse train frequency filter time constant	
CA-94	Pulse train frequency bias size	
CA-95	Pulse train upper frequency detection level	
CA-96	Pulse train lower frequency detection level	
CA-97	Pulse counter compare match output ON value	
CA-98	Pulse counter compare match output OFF value	
CA-99	Pulse counter maximum value	
CC-06	Output terminal [RL] function	No actual output, but monitoring is possible (dA-54).
CC-16	Output terminal [RL] active state	Because there are no terminal for using these functions, these parameters become invalid.
CC-30	Output terminal [RL] on-delay time	
CC-31	Output terminal [RL] off-delay	
CC-01 to CC-05 CC-07	Output terminal [*] function * = UPF to X3, FL	Because there are no terminals for using the below function, the setting to these parameters become invalid. 044: Pulse count compare-match output

Warranty

Warranty period	The warranty shall be 18 months from date of shipment or 12 months after initial operation, whichever is shorter.
Warranty condition	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. 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.
Warranty exclusion	Not withstanding the above warranty, the warranty as set forth herein shall not apply to any problem or damage to the Product that is caused by: 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)
4200 Holland 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,
Bodega D-1 Delta Bárcenas en Villa Nueva, Guatemala
TEL (502)6648-0500 FAX (502)6631-9171

Colombia

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

Peru

SM Cyclo de Perú, S.A.C (SMPE)
Jr. Monte Rosa 255, Oficina 702, Lima,
Santiago de Surco, Perú
TEL (51)1-713-0342 FAX (51)1-715-0223

Germany

Sumitomo (SHI) Cyclo Drive Germany GmbH (SCG)
Cyclostraße 92, 85229 Markt Indersdorf, Germany
TEL (49)8136-66-0 FAX (49)8136-5771

Austria

Sumitomo (SHI) Cyclo Drive Germany GmbH (SCG)
SCG Branch Austria Office
Gruentalerstraße 30A, 4020 Linz, Austria
TEL (43)732-330958 FAX (43)732-331978

Belgium

Hansen Industrial Transmissions NV (HIT)
Leonardo da Vincilaan 1, Edegem, Belgium
TEL (32)34-50-12-11 FAX (32)34-50-12-20

France

SM-Cyclo France SAS (SMFR)
8 Avenue Christian Doppler, 77700 Serris, France
TEL (33)164171717 FAX (33)164171718

Italy

SM-Cyclo Italy Srl (SMIT)
Via dell' Artigianato 23, 20010 Cornaredo (MI), Italy
TEL (39)293-481101 FAX (39)293-481103

Spain

SM-Cyclo Iberia, S.L.U. (SMIB)
C/Gran Vía Nº 63 Bis, Planta 1, Departamento 1B
48011 Bilbao–Vizcaya, Spain
TEL (34)9448-05389 FAX (34)9448-01550

United Kingdom

SM-Cyclo UK Ltd. (SMUK)
Unit 29, Bergen Way, Sutton Fields Industrial Estate,
Kingston upon Hull, HU7 0YQ, East Yorkshire,
United Kingdom
TEL (44)1482-790340 FAX (44)1482-790321

Turkey

SM Cyclo Turkey Güç Aktarım Sis. Tic. Ltd. Sti. (SMTR)
Barbaros Mh. Çiğdem Sk. Ağaoğlu, Office Mrk. No:1 Kat:4 D.18
Ataşehir, İstanbul, Turkey
TEL (90)216-250-6069 FAX (90)216-250-5556

India

Sumi-Cyclo Drive India Private Limited (SDI)
Gat No. 186, Raisoni Industrial Park, Alandi Markal Road,
Fulgaon-Pune, Maharashtra, India
TEL (91)96-0774-5353

China

Sumitomo (SHI) Cyclo Drive Shanghai, Ltd. (SCS)
11F, SMEG Plaza, No. 1386 Hongqiao Road,
Changning District, Shanghai, China 200336
TEL (86)21-3462-7877 FAX (86)21-3462-7922

Hong Kong

SM-Cyclo of Hong Kong Co., Ltd. (SMHK)
Room 19, 28th Floor, Metropole Square, No.2 On
Yiu Street, Shatin, New Territories, Hong Kong
TEL (852)2460-1881 FAX (852)2460-1882

Korea

Sumitomo (SHI) Cyclo Drive Korea, Ltd. (SCK)
Royal Bldg. 19 Rm. 913, 5 Saemunan-ro 5-Gil Jongro-Gu
Seoul, Korea 03173
TEL (82)2-730-0151 FAX (82)2-730-0156

Taiwan

Tatung SM-Cyclo Co., Ltd. (TSC)
22 Chungshan N. Road 3rd., Sec. Taipei, Taiwan 104,
R.O.C.
TEL (886)2-2595-7275 FAX (886)2-2595-5594

Singapore

Sumitomo (SHI) Cyclo Drive Asia Pacific Pte. Ltd. (SCA)
15 Kwong Min Road, Singapore 628718
TEL (65)6591-7800 FAX (65)6863-4238

Philippines

Sumitomo (SHI) Cyclo Drive Asia Pacific Pte. Ltd. Philippines Branch Office (SMPH)
C4 & C5 Buildings Granville Industrial Complex, Carmona,
Cavite 4116, Philippines
TEL (63)2-584-4921 FAX (63)2-584-4922

Vietnam

SM-Cyclo (Vietnam) Co., Ltd. (SMVN)
Factory 2B, Lot K1-2-5, Road No. 2-3-5A,
Le Minh Xuan Industrial Park, Binh Chanh Dist.,
HCMC, Vietnam
TEL (84)8-3766-3709 FAX (84)8-3766-3710

Malaysia

SM-Cyclo (Malaysia) Sdn. Bhd. (SMMA)
No.7C, Jalan Anggerik Mokara 31/56, Kota Kemuning,
Seksyen 31, 40460 Shah Alam, Selangor Darul Ehsan,
Malaysia
TEL (60)3-5121-0455 FAX (60)3-5121-0578

Indonesia

PT. SM-Cyclo Indonesia (SMID)
Jalan Sungkai Blok F 25 No. 09 K, Delta Silicon III,
Lippo Cikarang, Bekasi 17530, Indonesia
TEL (62)21-2961-2100 FAX (62)21-2961-2211

Thailand

SM-Cyclo (Thailand) Co., Ltd. (SMTH)
195 Empire Tower, Unit 2103-4, 21st Floor, South
Sathorn Road, Yannawa, Sathorn, Bangkok 10120,
Thailand
TEL (66)2670-0998 FAX (66)2670-0999

Australia

Sumitomo (SHI) Hansen Australia Pty. Ltd. (SHAU)
181 Power St, Glendenning, NSW 2761, Australia
TEL (61)2-9208-3000 FAX (61)2-9208-3050

Japan

Sumitomo Heavy Industries, Ltd. (SHI)
ThinkPark Tower, 1-1 Osaki 2-chome, Shinagawa-ku,
Tokyo 141-6025, Japan
TEL (81)3-6737-2511 FAX (81)3-6866-5160

Sumitomo Heavy Industries, Ltd.

Power Transmission & Controls Group
Headquarter ThinkPark Tower, 1-1 Osaki 2-chome, Shinagawa-ku, Tokyo 141-6025, Japan

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