No.QT33-04003A

CE

2 phase stepping motor Driver

NanoDrive

INS200 series

【User's manual】

MYCOM

Please understand that we may make modifications to our products without notification in order to improve the capabilities and external appearance of our products.

MYCOM, INC. (Head office)

12, S. Shimobano, Saga hirosawa, Ukyo, Kyoto, Japan 616-8303

TEL: 81-75-882-3601 FAX : 81-75-882-6531

Home Page : http//www.mycom-japan.co.jp/

NYDEN CORP.

2610,North First St. #B San Jose, Ca, 95134, USA

TEL: 1-408-232-7700

Home Page: http//www.nyden.com

MYCOM TECHNOLOGY, INC.

2Fl., No.333, Fuhsing N, Road Taipei, Taiwan, R.O.C.

TEL : 886-2-2719-0525

MYCOM KOREA, INC.

Rm.301, Keum Chang Bldg. #328-1, 6Ka, Dangsan-Dong Yeoung Dungpo-ku Seoul, Korea

TEL : 82-2-2635-6703

MYCOM THCHNOLOGY (SINGAPORE) PTE. LTD.

No.1, Sims Lane #05-05, One Sims Lane, Singapore 387355

TEL : 65-6743-4476

Home Page : http//www.mycommts.com.sg

Malaysian Contact;

No.1E-12-07, Jalan Batu Uban, Sunny Ville, Penang, Malaysia

TEL : 60-04-656-0328

Safety precautions

Please read this operation manual thoroughly before starting any operation. This manual will guide the customers for proper use and avoid any mis-operation. This manual if properly read, will protect the users as well as other people from possibilities physical injuries, property damage and other serious accidents.

⚠DANGER Indicates a possibility of causing serious injury or worst, death to the user, caused by fire or electric shock if this warning is ignored. Also indicates that the equipment has the highest degree of causing damage.

⚠WARNING This shows the possibility that the user may get serious injury by fire or electrical shock if this warning is neglected.

⚠CAUTION This shows the possibility that may cause slight injury or damage to this product or other equipment.

⚠DANGER

- Do not operate this product if it is damaged or disassembled. Otherwise, it may cause fire or electrical shock.
- In any case, do not attempt to repair or modify this product as it may cause fire, electrical shock or serious injuries.
- Do not use this product, in a place where the air includes a corrosive gas, inflammable gas, or any type of explosive gas, or the water or oil splashes, or it is near a flammable material. Otherwise, it may cause fire or electrical shock.
- Leave works such as installation, wiring, operation, checking and maintenance to experts who have enough knowledge on this product. Operation without knowledge may cause electrical shock and other serious physical or property damages.
- Keep the power supply within the rated voltage range. Otherwise, it may cause fire or other damages.
- Make sure all the connections correctly done referring to the wiring diagram shown in this user's manual. Otherwise, it may cause fire or other damages.
- Do not, in any circumstances, touch the terminal block while the power is on as there are some terminals which high voltage appeared. Otherwise, it may cause electrical shock.
- Do not touch or place objects such as metals or foreign substance on the board. Otherwise, it may cause fire or electrical shock.
- Do not bend, pull or place the power or motor lines by the extreme force. Otherwise, it may cause fire or electrical shock.
- Do not make a mistake connecting the motor output terminals to protective earth or power supply. Otherwise, it may cause fire.
- Do not do the driver's installation preventing ventilation. Otherwise, it may cause fire.
- When the "HEAT" is activate, stop the pulse signal. Otherwise, it may cause fire. (Only the product have a Overheat function.)

⚠WARNING

- Do not attempt any type of works such as moving the machine, wiring, maintenance, checking while the power is on. It is recommended that such works should be done only when more than ten seconds have elapsed after the power is off. Otherwise, it may cause electrical shock.
- Do not touch this product with wet hands while the power is on. Otherwise, it may cause electrical shock.
- Connect the protective earth terminal (PE) properly to it on your equipment, as illustrated in this user's manual. Otherwise, it may cause electrical shock.
- Use this product which installed properly in the enclosure. Otherwise, it may cause electrical shock or injury.
- Do not leave the cover off from the terminal block while the power is on. Otherwise, it may cause electrical shock or injury.
- Fix this product securely onto your equipment. Otherwise, it may cause injury.
- Do not touch this product while it is running or right after it is stopped. Otherwise, it may cause injury, as its surface remains hot.
- Depending on the setting of this product, it may show an unexpected operation when recovering from overheating. Please read this user's manual carefully and pay a special attention.
- Use a DC power supply with reinforced insulation for dangerous voltage. Otherwise, it may cause electrical shock.(Only DC input type)

⚠CAUTION

- Do not use or store this product under a dusty environment. Otherwise, it may cause malfunction.
- Do not give a big shock to this product. Otherwise, it may cause malfunction.
- Do not use or store this product in a place of high or low temperature, or under an environment of extremely high or low humidity. Otherwise, it may cause short circuit to your device or further damage.
- Do not install this product in a place where a dew is generated. Otherwise, it may cause short circuit to your device or further damage.
- MYCOM is, in no way, responsible for any damages or malfunctions that are caused by user's repair or modifications on this driver. If the user performed these initiations and the driver does not work satisfactorily, a warranty will not be provided.
- When giving up the use of the driver, dispose it according to an appropriate regulation on the industrial waste.
- Please do not remove the name plate.

INDEX

1. Specification of driver

INS200-030L/INS200-230L

Driver model #	INS200-030L	INS200-230L
Power source	DC24 to 36V±10%	
Power consumption	36W or less	60W or less
Driving type	Uni-Polar constant current type	
Output current	0.8A/phase Max	2.0A/phase Max
Resolution	Basic step : 1, 2, 2.5, 4,5, 8, 10, 20, 25, 40, 50, 100, 200, 250, 500, 1000 division	
Function	Auto-current down, Input of output current off, Exciting timing output,	
Signal input	Photocoupler input; Input resistance 390Ω Input signal voltage: L :0 - 0.5V, H : 4 - 5V 1 pulse (PLUSE, CW/CCW), 2 pulse (CW, CCW), CO	
Signal output	Photocoupler open-collector output, Limited capacity 25V 10mA or less, MONI, HEAT	
Insulation Resistance	100MΩ or more with applied DC500V megger in normal temperature and humidity. ・Power input : Motor leads collection terminal - chassis ・Power input : Motor leads collection terminal - Signal I/O terminal	
Operating environment temperature	0 to +40℃ No freezing	
Operating environment humidity	Less than 80%, No condensation	
Storing environment temperature	-10 to +60℃ No freezing	
Storing humidity	Less than 80%, No condensation	
Operating height	Less than 1,000m from sea level	
Atmosphere	In the room without corrosive gas, inflammable gas and dust. Without splashing water and oil.	
Applicable Standard	EN60950	
Weight	240g.	
Accessories	User's manual (This book), Connector(J.A.E.), Housing : each of IL-2S-S3L, IL-6S-S3L and IL-9S-S3L Contact : 17 pcs. of IL-C2-10000	
※Applicable motor		PF243-A(B),PF244-A(B),PF245-A(B) PF264-A(B),PF266-A(B),PF268-A(B)

2. Model number & Factory default

2-1. Model number of set

ＩＮＳ２００－２３０Ｌ－２６８Ａ

Series name　　Extension of set

List of motor and driver combination

Series name, INS200			
Extension of set	Motor model #	Current A/phase	Driver model #
243A(B)	PF243-A(B)	0.9	INS200-230L
244A(B)	PF244-A(B)	1.2	
245A(B)	PF245-A(B)	1.2	
264A(B)	PF264-A(B)	2.0	
266A(B)	PF266-A(B)	2.0	
268A(B)	PF268-A(B)	2.0	

2-2. Driver model number

ＩＮＳ２００－０ ３ ０ Ｌ

Series name

Power source,　3 : DC24-36V

Phase current,　0 : 0.8A/phase,　1 : 2.0A/phase

2-3. Factory default

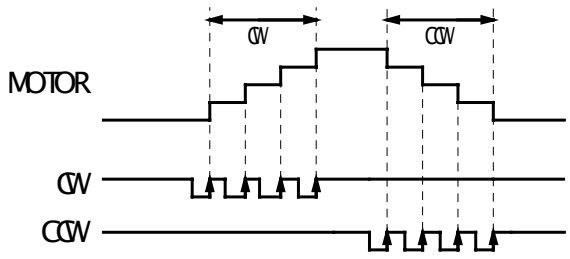
Driver model number	INS200-030L	INS200-230L
Phase current	0.8 A/phase Max	2.0 A/phase Max
Current down value	0.4 A/phase	1.0 A/phase
Auto current down function	Auto current down function, valid	
Input type	2 pulse type	
Resolution	1/1(FULL)	

3. Pulse waveform

3-1. Input pulse type

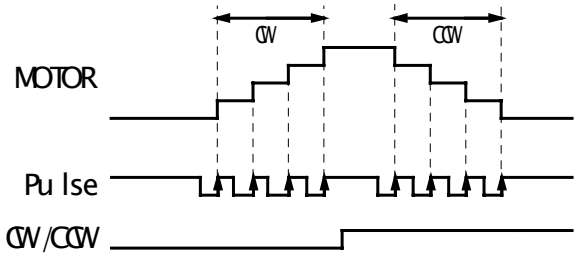
2pulse type

Timing chart



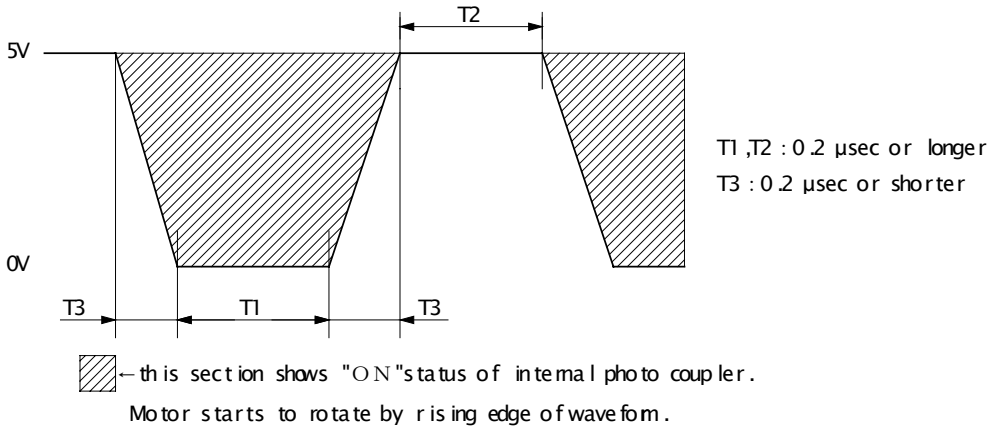
1pulse type

Timing chart



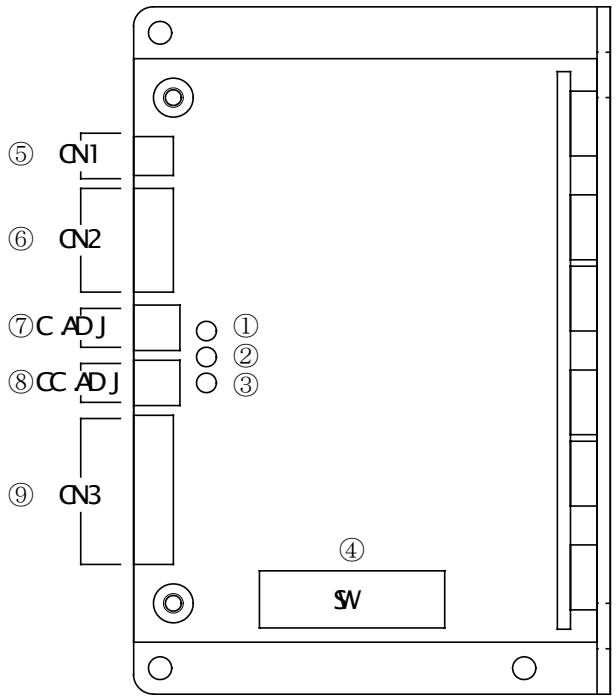
3-2. Pulse waveform

Please input the pulse signal of the below shown waveform.



4. Each part name and functions

4-1. Each part name



①Power display LED (POWER)
This lights on during power on.

②Excitation home display LED(MONI)
This lights on when excitation home.

③Overheat display LED (HEAT)
The light is switched on at the time of overheat.

④Switching

- Motor change: 1st-4th pole
  Adaptation motor data is changed.
- Resolution select switch: 5th-8th pole
  Resolution is changed.
- Switching of input pulse type (2P/1P) : 9th pole
  This switches the input pulse type
- Switching of Auto current down function(A.CD) : 10th pole
  This turns on/off the auto current down function.

⑤Power connector(CN-1)
Connect power.

⑥Motor connector(CN-2)
Connect in accordance with the color of motor Leads.

⑦Current adjust volume for current(C.ADJ)
This adjusts the current when motor run.

⑧Current adjust volume for current down(CC.ADJ)
This adjusts the current when current down.

⑨Signal I/O connector(CN-3)
Various I/O signals are connected.

4-2. Description of function

4-2-1. Power display LED (POWER)

This lights on during power on.

4-2-2. Excitation home display LED (MONI, Pin # CN-3, 7-9)

This lights on when the output excitation pattern is excitation home.

Then the signal is outputted to MONI terminal of CN-3. Please refer **5. Example of wiring.**

4-2-3. Current off function (CO, Pin # CN-3, 5-6)

The signal between +COM and -CO of CN-3 can control the excitation or non-excitation of motor. Please refer "**5. Example of wiring**".

H level : excitation off (A photo-coupler is at the 'ON' time.)

L level (or no connection): excitation on

4-2-4. Overheat display LED (HEAT, Pin # CN-3, 8-9)

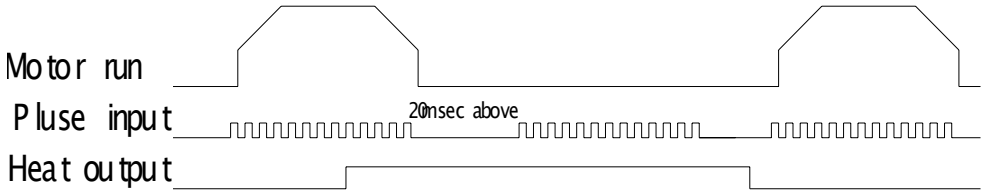
This lights on when the temperature of internal heat-sink exceeds about 70℃.

Then a signal is outputted to the HEAT output of CN-1.

4-2-5. Overheat function

When a HEAT output is outputted, driver receives and operates the pulse which is being currently inputted. However, if a pulse input once goes out and there is no pulse input for 20msec(s), even if driver receves any pulses after that, it will not be operated. Excitation is maintained while driver is detecting HEAT signal (Motor does not become free.). Moreover, if temperature falls and HEAT is canceled after HEAT output, a pulse will be received and driver will operate.

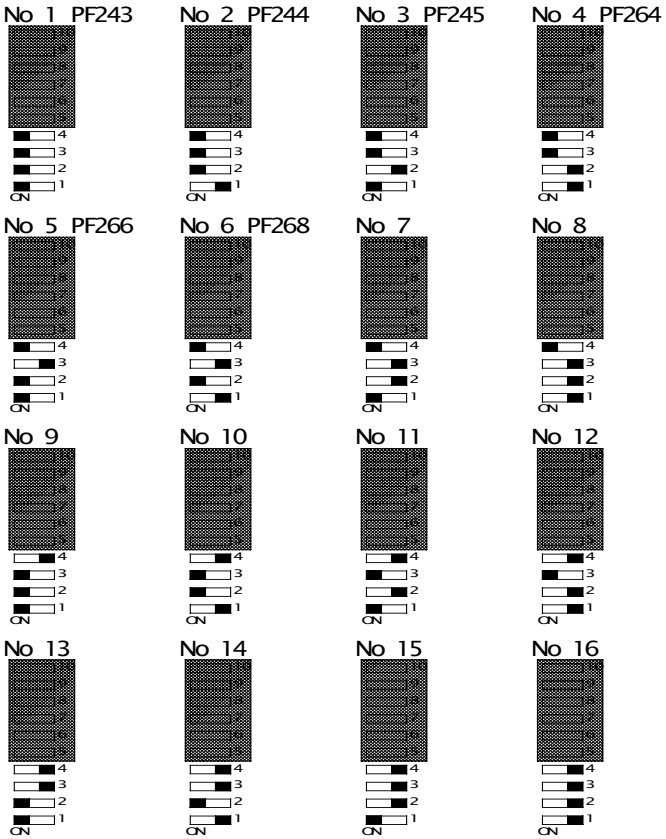
⚠CAUTION Sudden operation is expected for the return from HEAT.
Be careful.



4-2-6. Motor change

An adaptation motor is set up by a dip switch. (4-1.Part name④　SW 1st-4th pole)

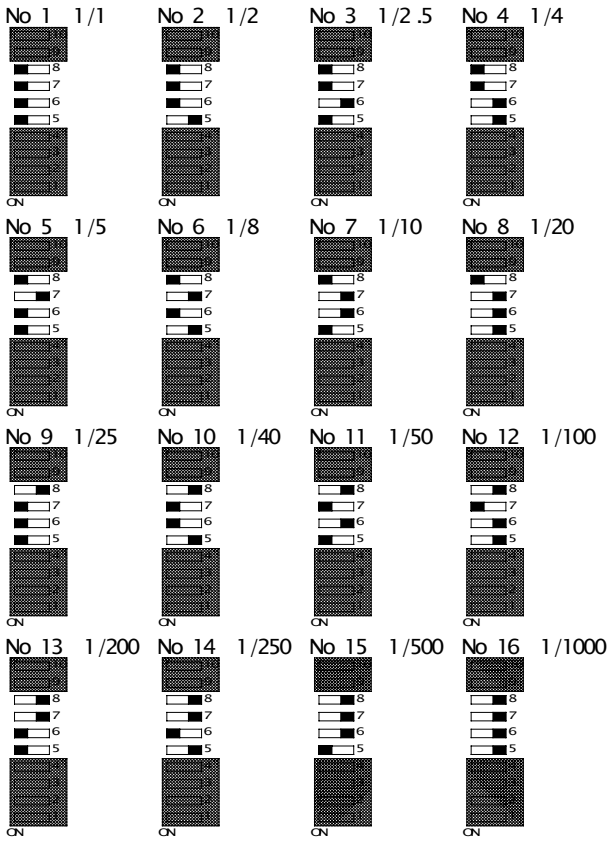
	adaptation motor
No　1	PF243-A(-B)
No　2	PF244-A(-B)
No　3	PF245-A(-B)
No　4	PF264-A(-B)
No　5	PF266-A(-B)
No　6	PF268-A(-B)
No　7	-
No　8	-
No　9	-
No　10	-
No　11	-
No　12	-
No　13	-
No　14	-
No　15	-
No　16	-



4-2-7. Resolution select switch

Resolution select switch.(4-1.Each part name④ SW 5th-8th pole) can set 16 various resolutions individually.

	Resolution
No 1	1 / 1
No 2	1 / 2
No 3	1 / 2.5
No 4	1 / 4
No 5	1 / 5
No 6	1 / 8
No 7	1 / 10
No 8	1 / 20
No 9	1 / 25
No 10	1 / 40
No 11	1 / 50
No 12	1 / 100
No 13	1 / 200
No 14	1 / 250
No 15	1 / 500
No 16	1 / 1000



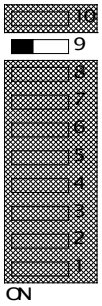
1/1 to 1/200 resolution of INS200 series are equianglor resolution and 1/250 to 1/1000 resolution are follow-up control resolution

- Equianglar resolution; The resolution which equally carries out an angle change per one pulse
- Follw-up control resolution; The resolution which carries out an angle change per one pulse

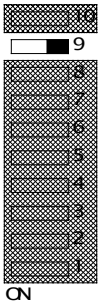
4-2-8. Pulse input type select switch (1P/2P, SW 9th pole)

2P/1P switch sets the driving pulse to 2 pulse type or 1 pulse type.
(4-1 Each pat name④ SW 9th pole) Please refer "**3. Pulse wave"** about input type.

2 pulse type



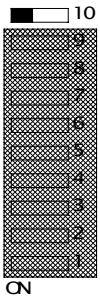
1 pulse type



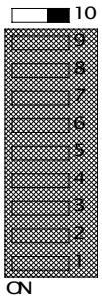
4-2-9. Auto current down function (A.CD, SW10th pole)

This reduces the motor driving current to 50%(default) of normal current to reduce temperature rising of motor after the motor stops and 200ms. later.
OFF/A.CD switch (4-1, Each part name④ SW10th pole) can release the function.

A.CD Release



A.CD Effective



⚠CAUTION

・When automatic current down release is carried out, compulsive air cooling is required for a driver.
・When automatic current down release is carried out, be careful of heat generation of a motor and a driver.

4-2-10. Current adjusting volume of current (C.ADJ)

Motor run current adjust (4-1. Each part name⑦).

4-2-11. Current adjusting volume of current down (CC.ADJ)

During current down status the motor driving current is adjustable by the volume of CC.ADJ (4-1. Each part name⑧).
INS200-030L : Within about 45 to 85 percent of normal driving current
INS200-230L : Within about 30 to 80 percent of normal driving current

⚠CAUTION

・When making a current down current value 50% or more by INS200-230L, compulsive air cooling is required for a driver.
・Be careful of heat generation of a motor and a driver.

4-2-12. Power supply connector (CN-1)

DC24 to 36V and 0V are connected.

Connector pin assignment	
1	DC24 to 36V
2	0V

4-2-13. Motor connector (CN-2)

This is connected according to the motor lead color.

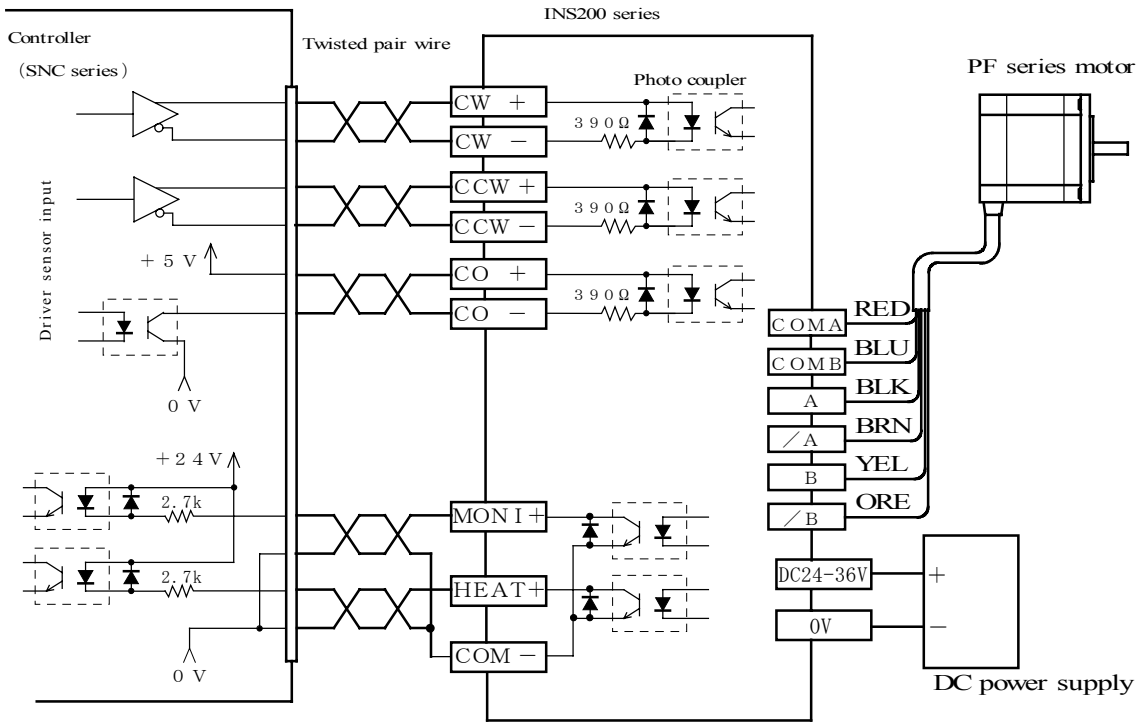
Connector pin assignment			
1	COM A	4	／A
2	COM B	5	B
3	A	6	／B

4-2-14. Signal I/O connector (CN-3)

This is to be connected with driving pulse, current off signal, resolution switching signal and various monitor signals.

Connector pin assignment			
1	CW+	6	CO－
2	CW－	7	MONI
3	CCW+	8	HEAT
4	CCW－	9	COM
5	CO+		

5. Example Of connection



6. Wiring and Install condition

6-1. Wiring of power line

- Install noise filter at power input if noise sources exist near the driver.
- Install noise filter at power input if there are effects of power noise.

6-2. Wiring of motor line

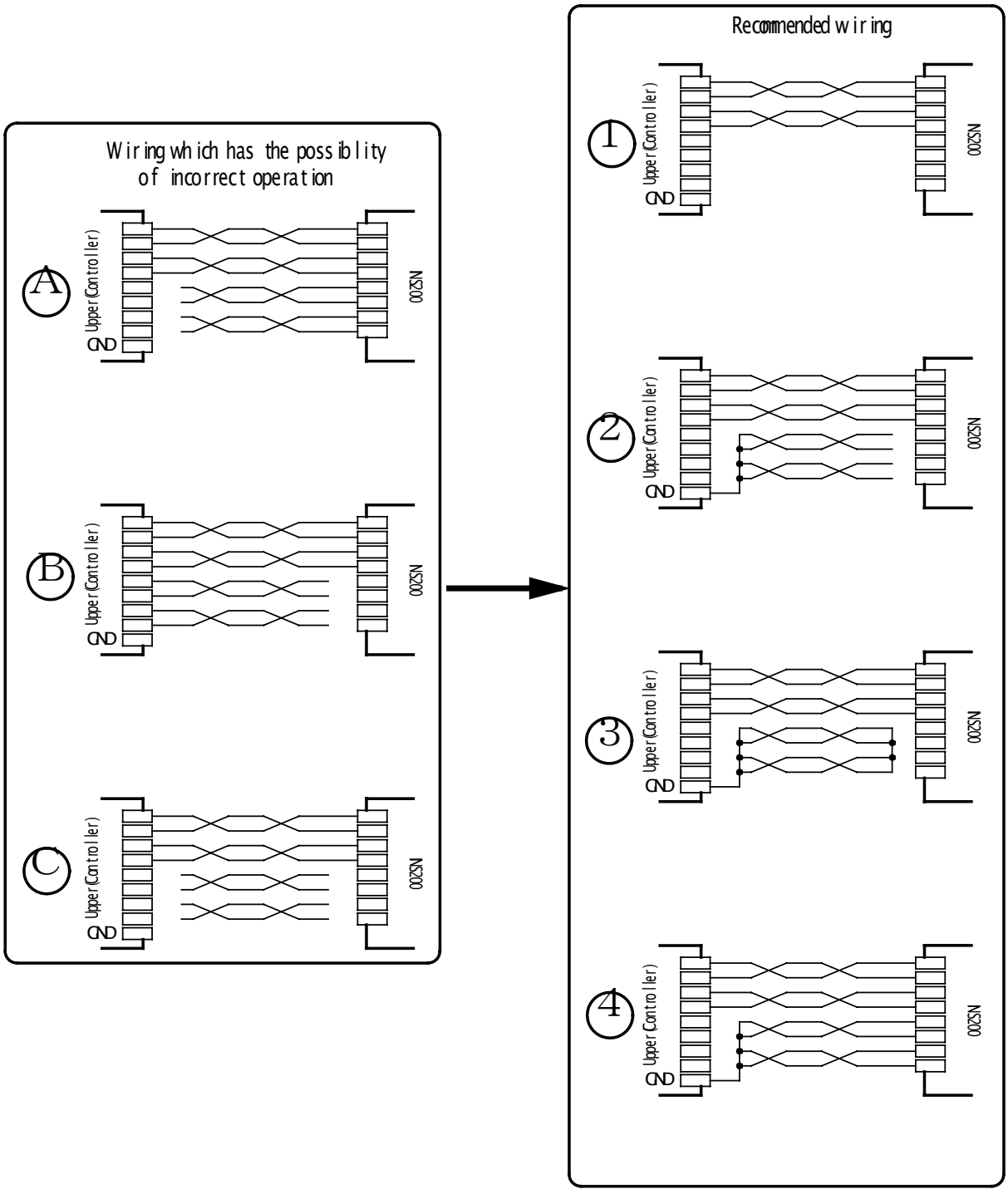
- Using shield wire can depress the radiant noise in case that the unnecessary radiation causes troubles.

6-3. Wiring of signal line

If the following procedure is not made, there may be a cause of incorrect operation.

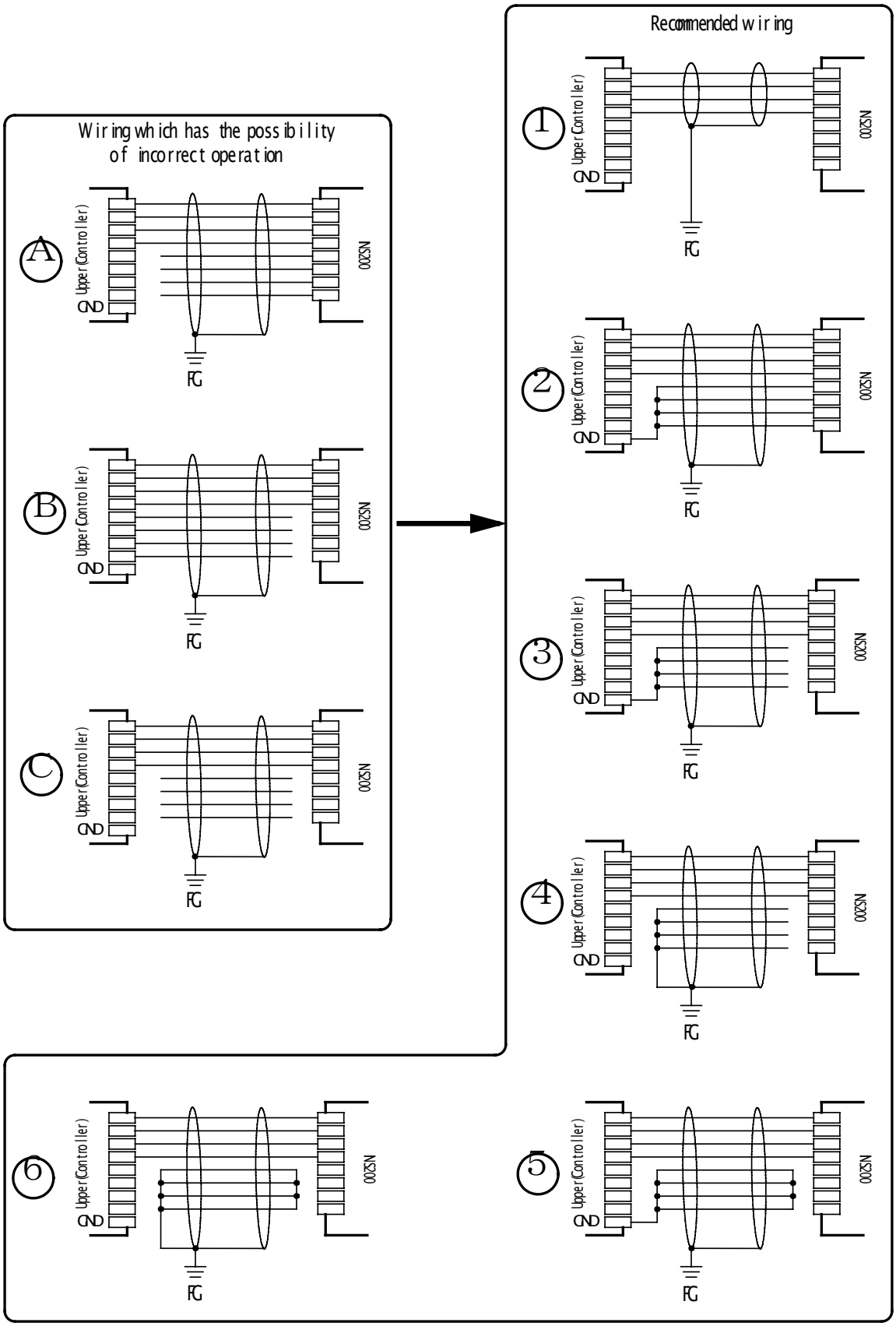
- Use bigger cable than AWG28 which suits with the connector.
- Use twisted pair line or shield line.
- ① of twisted pair wiring diagram is recommended in case of twisted pair line but select and use a suitable diagram of ② to ④ depending on cable and environment. However do not wire as Ⓐ to Ⓒ

Twisted pair wiring diagram



・ ① of shield line wiring diagram is recommended in case of shield line but select and use a suitable diagram of ② to ⑥ depending on cable and environment. However do not wire as Ⓐ to Ⓒ

Shield line wiring diagram



6-4. Install condition

・Use in control box. This unit is designed by the following condition.

Over voltage category: Category I, Material group Ⅲ
Pollution degree: Class 2
Protection structure : IP00 (INS200-030L/230L)
Protection against electric shock: Class Ⅲ component

・Fix the driver on heat conductive metal plate tightly.
・Put 3cm or more space between each driver and fix the drivers when multiple drivers are arranged.
・Because this unit uses high speed photo coupler for the part of input pulse, use the shield line for signal line
・Use M3 screws of length of "thickness of installing place plus 3mm".

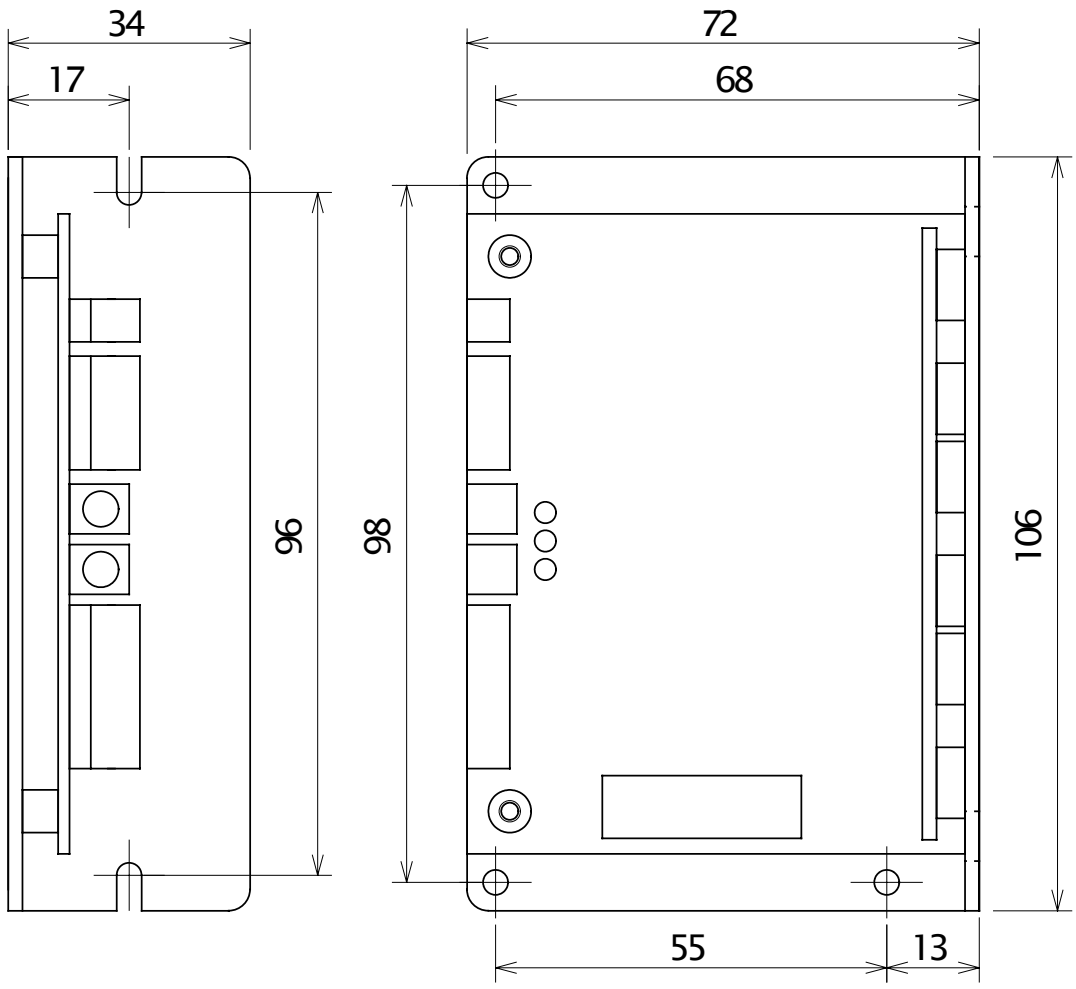
When attached metal brackets are not used but installing by screws directly, use screws of "the thickness of installing part plus 3 to 7 mm".

⚠CAUTION

Use the driver in the condition that the heat sink temperature is under 60℃.

7. Dimension

7-1. Dimension of INS200-030L/INS200-230L



Unit: mm. The screw head is not included.

8. Option

It is available to supply the following optional cables which have covering connector at the one side.

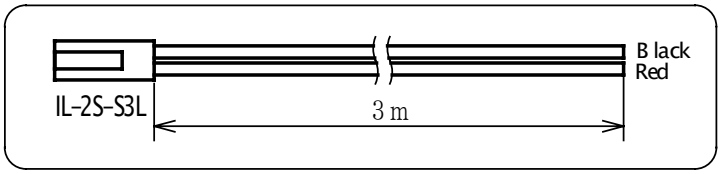
・CN1 : Power cable

Model number : OPC-IL2P3

Connector : IL-2S-S3L

Cable : Loose cable

AWG22 3m



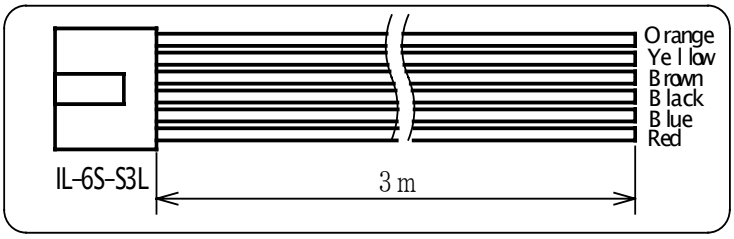
・CN2 : Motor cable

Model number : OMC-IL5P3

Connector : IL-6S-S3L

Cable : Loose cable

AWG22 3m



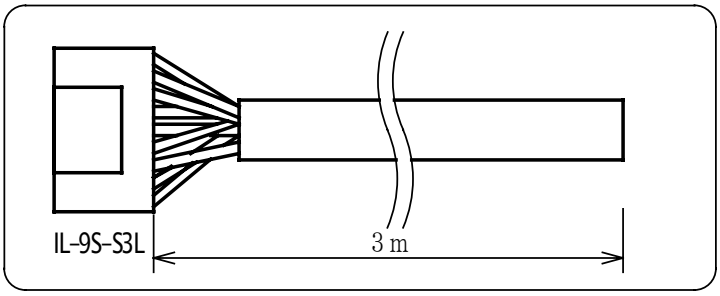
・ＣＮ３ : Pulse cable

Model number : OSC-1L9P3

Connector : IL-9S-S3L

Cable : Shield cable

AWG24 3m



Pin #	1	2	3	4	5	6	7	8	9	
Insulator color	Orange		Yellow		Green		Gray		White	
Dot's color	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red

Because the cable of which insulator color is white and dot's color is red is not used, please connect with the ground of the upper.

Connect the unused cables with the ground of the upper. Otherwise it may become the cause of incorrect operation. Please refer 6-3 "Wiring of signal line" for the detail.

このページは取扱説明書に添付せず。

変更履歴

変更日	ﾊﾞｰｼﾞｮﾝ	変更箇所	内容	変更者