MITSUBISHI ELECTRIC ENGINEERING

Network amplifier junction terminal block

MODEL

DG2SV3TB

User's Manual

(Detailed Edition)

Time and Wire Saving Devices

● SAFETY PRECAUTIONS ●

Please read the instructions carefully before using the equipment.

To use the equipment correctly, do not attempt to install, operate, maintain, or inspect the equipment until you have read through this manual and appended documents carefully.
Do not use the equipment until you have a full knowledge of the equipment, safety information, and instructions.
In this user's manual, the safety instruction levels are classified into "WARNING" and "CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight injury to personnel or may cause physical damage.

Note that the ⚠CAUTION level may lead to a serious consequence depending on conditions.
Please follow the instructions of both levels because they are important to personnel safety.
After reading this Instruction Manual, keep it accessible to the operator.

1. To prevent electric shock, note the following

⚠WARNING
• Any person who is involved in wiring and inspection should be fully competent to do the work. • The cables should not be damaged, stressed, loaded, or pinched. Otherwise, it may cause an electric shock. • To avoid an electric shock, insulate the connections of the power supply terminals. • Shut off all the external power supplies before installation and wiring. Otherwise, it may cause an electric shock or damage the product.

2. To prevent fire, note the following

⚠CAUTION
• Install the equipment on incombustible material. Installing them directly or close to combustibles will lead to a fire. • Provide an adequate protection to prevent screws and other conductive matter, oil and other combustible matter from entering the product.

3. To prevent injury, note the following

⚠ CAUTION
• Connect cables to the correct terminals. Otherwise, a burst, damage, etc., may occur. • Ensure that polarity (+/-) is correct. Otherwise, a burst, damage, etc., may occur.

4. Additional instructions

The following instructions should also be fully noted. Incorrect handling may cause a malfunction, injury, electric shock, fire, etc.

(1) Transportation and installation

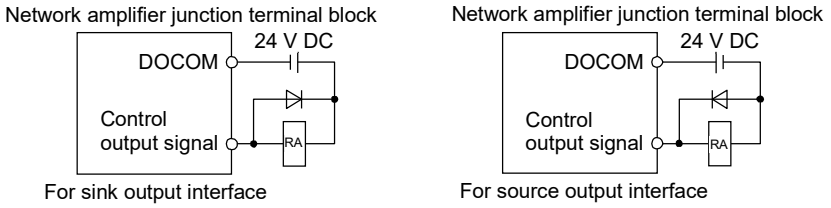
⚠CAUTION

- This product is precision equipment. During transportation, avoid impacts larger than those specified in general specifications. Otherwise, it may cause a malfunction.
- Do not get on or put heavy load on the equipment.
- Do not install or operate the unit which has been damaged or has any parts missing.
- This product is precision equipment. Do not drop or apply strong impact to the product.
- Use the product in the general specification environment specified in this manual. Otherwise, it may cause an electric shock, fire, malfunction, and damage or deterioration of product.
- When handling the product, be careful with the sharp edges of the product.
- The product must be installed in a metal cabinet.
- The product must be fixed on a DIN rail securely. When the unit is not mounted correctly, it may malfunction, fail, and drop.
- When fumigants that contain halogen materials, such as fluorine, chlorine, bromine, and iodine, are used for disinfecting and protecting wooden packaging from insects, they cause a malfunction when entering our products. Please take necessary precautions to ensure that remaining materials from fumigant do not enter our products, or treat packaging with methods other than fumigation, such as heat treatment. Additionally, disinfect and protect wood from insects before packing the products.
- Noises are classified into external noises which enter the servo amplifier to cause it to malfunction and those radiated by the servo amplifier to cause peripheral equipment to malfunction. Since the servo amplifier is an electronic device which handles small signals, the general noise reduction techniques are required. Read the Instruction Manual to take countermeasures.

(2) Wiring

⚠CAUTION

- The product is designed for general-purpose AC servo amplifier manufactured by Mitsubishi Electric Corporation. Do not use them for any other products. Refer to chapter 4 for the target servo amplifier models.
- Wire the equipment correctly and securely. Otherwise, the servo motor may operate unexpectedly.
- The connection diagrams in this manual are shown for sink interfaces, unless stated otherwise.
- The surge absorbing diode installed to the DC relay for control output signals should be fitted in the specified direction. Otherwise, the servo amplifier will malfunction and will not output signals, disabling the emergency stop and other protective circuits.



- When the wires are not tightened enough to the terminal block, the wires or terminal block may generate heat because of the poor contact. Check that they are connected securely.
- To connect the wires to the unit, make sure of the rated voltage and terminal layout of product and perform correctly. Otherwise, it may cause a fire or malfunction.
- Install the connector in the unit securely. Otherwise, it may cause a malfunction.
- Prevent foreign matter such as dust or wire chips from entering the unit. Otherwise, it may cause a fire, failure or malfunction.
- For the wires and cables to be connected to the unit, put the cable in a conduit, or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the unit or cables or malfunction due to poor contact.

⚠CAUTION
• To remove the cable connected to the unit, do not pull the cable by hand. For the cable with the connector, remove it by grabbing the connector at the connection part of the unit. Remove the cable connecting the terminal block after releasing the spring lock of the terminal block. Do not pull the cable when it is connected to the unit. Otherwise, it may cause a malfunction or damage of unit and cable. • When connecting with the servo amplifier, check if the product configuration is correct. Otherwise, it may cause a failure or malfunction. • Since the line length is limited by the type of signal, check your Servo Amplifier Manual.

(3) Usage

⚠CAUTION
• Do not disassemble, repair, or modify the equipment. • Do not burn or destroy the product. Doing so may generate a toxic gas. • Provide a safety circuit, so that the entire system operates safely during the abnormality of external power supply and the failure of the servo amplifier and product. Otherwise, it may cause an accident.

(4) Corrective actions

⚠CAUTION
• Ensure safety by confirming the power off, etc. before performing corrective actions. Otherwise, it may cause an accident.

(5) Maintenance, inspection and parts replacement

⚠CAUTION
• Shut off all the external power supplies before mounting and dismounting the unit. Otherwise, it may cause a malfunction and damage of the unit. • Make sure not to connect and disconnect the cable more than 50 times. • Before touching the unit, make sure to touch the grounded metal, etc. and discharge the static electricity charged in the human body. Otherwise, it may cause a malfunction of the unit.

(6) General instruction

⚠CAUTION
• The product must be discarded as industrial waste.

REVISIONS

*The manual number is given on the bottom left of the back cover.

Revision Date	*Manual Number	Revision	
May 2019	50JS-050015-A	First edition	
May 2023	50JS-050015-B	Front cover	The product name is partially changed.
		Chapter 1	The product name is partially changed.
		Chapter 4	Connection models are added.
		Section 6-1	The product name is partially changed.
		Section 8-2	Connection servo amplifiers are added.
			The product name is partially changed.
			The diagrams are changed.
		Section 8-3	Connection servo amplifiers are added.
			The product name is partially changed.
		Section 8-4	The product name is partially changed.
		Section 8-5	The product name is partially changed.
		Section 8-6	The product name is partially changed.

CONTENTS

1. SUMMARY

This is a user's manual for the network amplifier junction terminal block describing such as its specifications. The network amplifier junction terminal block DG2SV3TB (herewith described as DG2SV3TB) must be used in combination with the general-purpose AC servo amplifier manufactured by Mitsubishi Electric Corporation.

2. GENERAL SPECIFICATIONS

Item		Specifications
Ambient temperature	Operation	0°C to 55°C (non-freezing)
	Storage	-20°C to 65°C (non-freezing)
Ambient humidity	Operation	5 %RH to 90 %RH (non-condensing)
	Storage	
Ambience		Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt
Altitude		2000 m or less above sea level
Vibration resistance		5.9 m/s^2, at 10 Hz to 55 Hz (directions of X, Y and Z axes)

3. PERFORMANCE SPECIFICATIONS

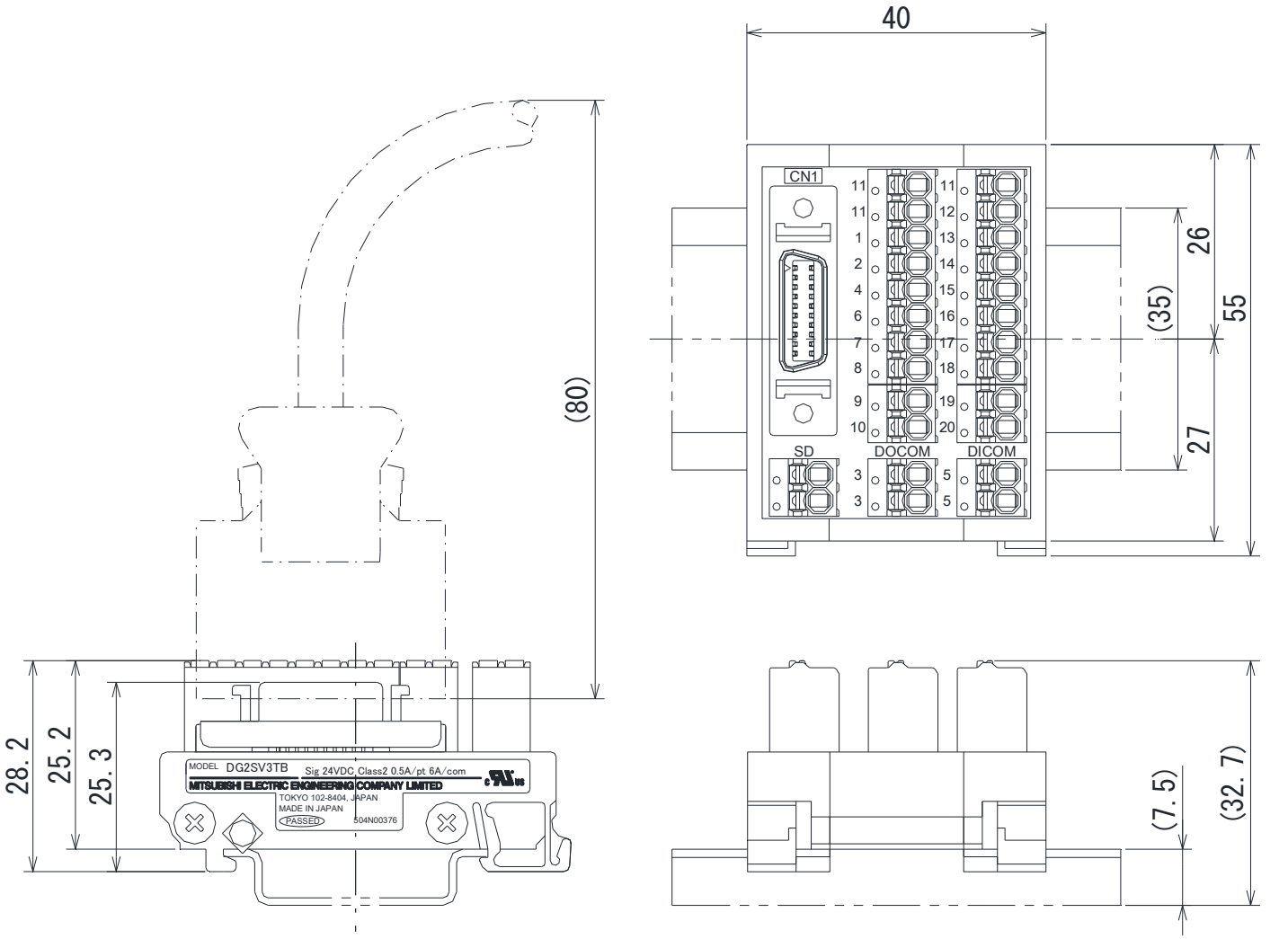
Item \ Model		DG2SV3TB
External power supply	Voltage	24 V DC ± 10%
	Maximum working current	Signal: 0.5 A, Common line: 6 A
Terminal block section	Number of terminals	26 terminals, number of cables per terminal: 1
	Applicable wire	Solid wire, twisted wire: 0.2 mm^2 to 1.5 mm^2 (AWG 24 to 16) film φ2.8 mm or less
	Wire strip length	8 mm to 9 mm (Maximum wire film dimension φ2.8 mm or less)
Compliance with global standards	UL standard	UL61800-5-1
Unit mounting	DIN rail	Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (IEC60715 compliant)
Mass		Approx. 40 g

4. CONNECTION MODEL AND CABLE

Connection model name	Connection model	Cable model
MELSERVO-J5 CC-Link IE TSN compatible servo amplifier	MR-J5-_G_(-RJ)	DG4SV2CB05 (length: 0.5 m) DG4SV2CB10 (length: 1.0 m) DG4SV2CB50 (length: 5.0 m)
MELSERVO-J5 SSCNET III/H compatible servo amplifier	MR-J5-_B_(-RJ)	
MELSERVO-J4 SSCNET III/H compatible servo amplifier	MR-J4-_B_(-RJ)	
MELSERVO-J4 CC-Link IE Field Network compatible servo amplifier	MR-J4-_GF_(-RJ)	
MELSERVO-J3 SSCNET III compatible servo amplifier	MR-J3-_B	

Note 1: MELSERVO is a registered trademark of Mitsubishi Electric Corporation.

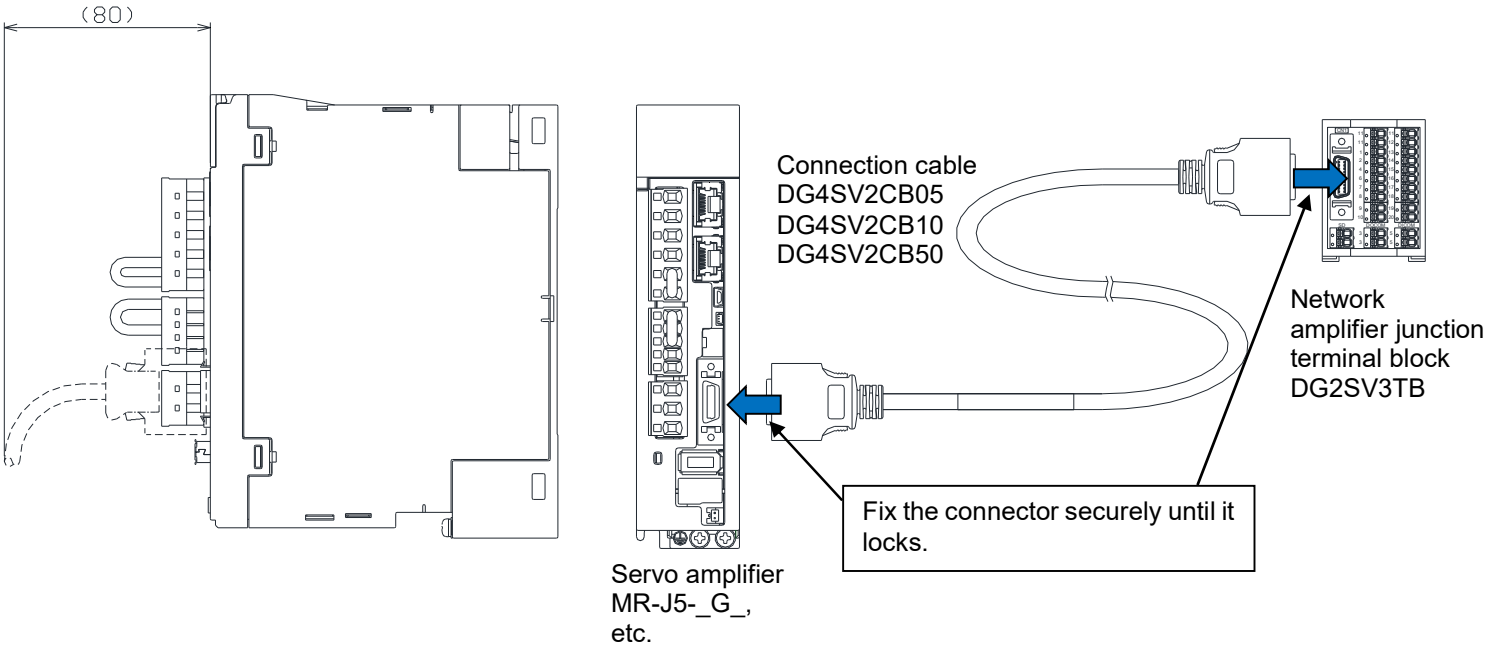
5. DIMENSIONS



[Unit: mm]

6. INSTALLATION PROCEDURE

6-1. When connecting DG2SV3TB to the servo amplifier

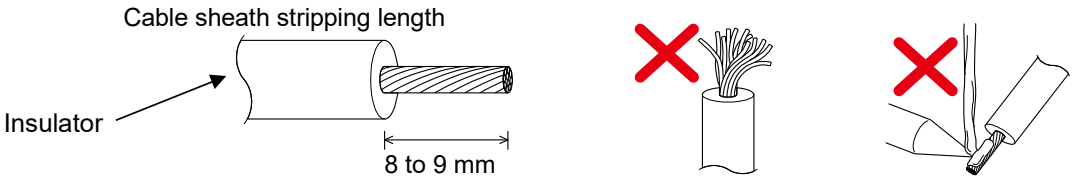


6-2. When wiring to the spring clamp terminal block

(1) Cable routing

(a) Fabrication on cable insulator

Strip the cable as follows. If the length of the sheath peeled is too long, a short circuit may occur with neighboring wires. If the length is too short, wires might come off. Wire the stripped cable after twisting it to prevent it from becoming loose. In addition, do not solder it.

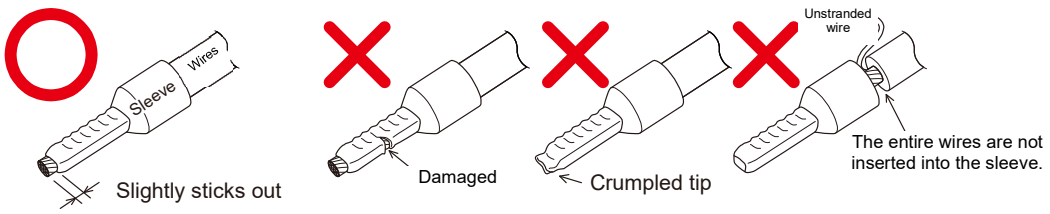


(b) Using a ferrule terminal

Insert wires to a ferrule terminal and crimp it.

Make sure that core wire slightly comes out of the ferrule.

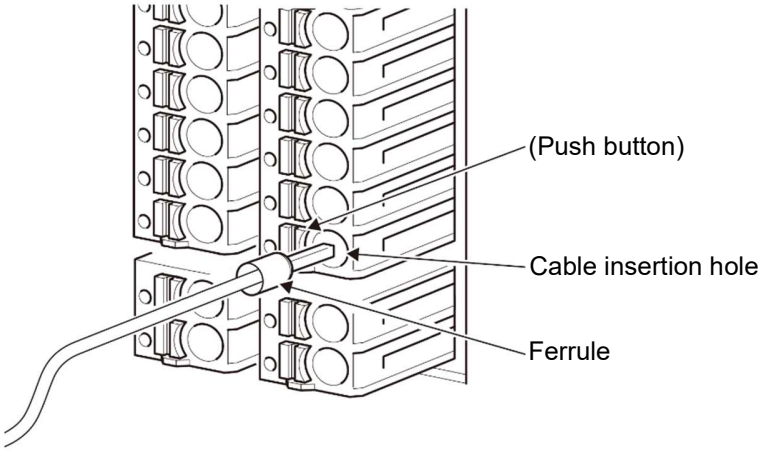
Check the condition of the ferrule terminal after crimping. Do not use a ferrule terminal of which the crimping is inappropriate, or the face is damaged.



Refer to chapter 9 for the applicable ferrule terminal.

(c) Inserting cable

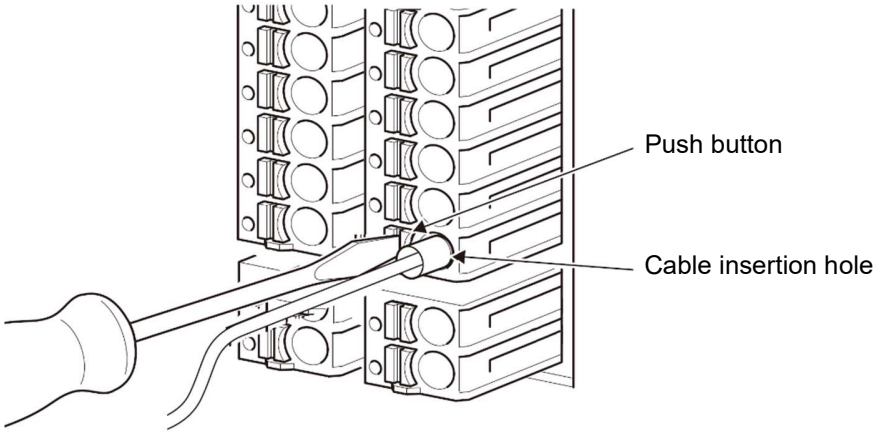
The cable with ferrule or solid cable can be inserted into the cable insertion hole. After inserting, pull the wire lightly to confirm that the cable is surely connected.



When binding twisted wires, press the push button using the screw driver, then insert the twisted wires into the cable insertion hole.

(2) Cable removal

Press the push button all the way using the screw driver, then pull out the wire.



Use the screw driver shown in the table below.

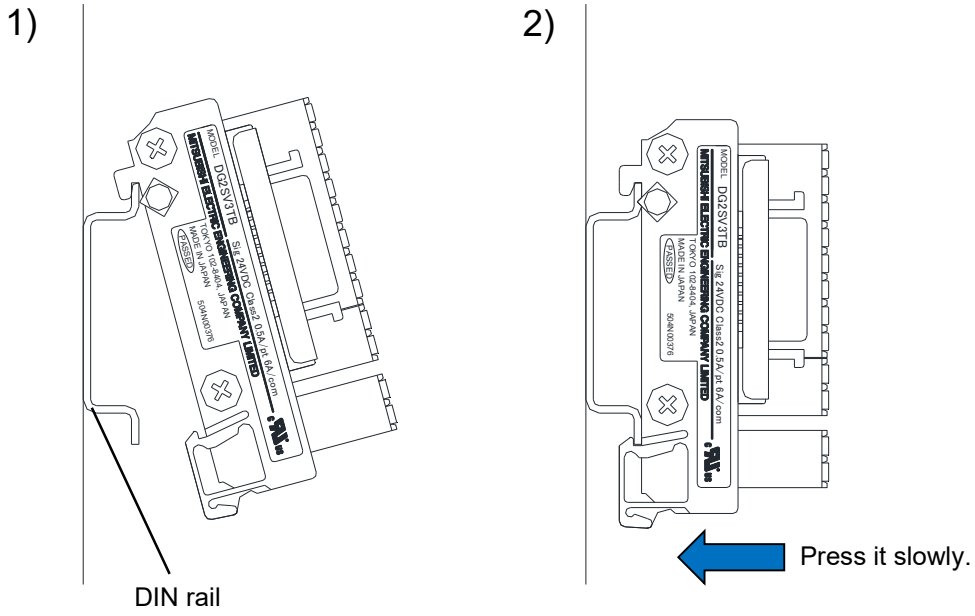
Recommended tool (screw driver)		
Manufacturer	Model	Blade edge size
WAGO Company of Japan, Ltd	210-119SB (Mini type)	2.5 x 0.4 mm
	210-719 (Insulation shaft type)	

6-3. When mounting on and dismounting from DIN rail

(1) Mounting on DIN rail

1) Hook the unit on the DIN rail.

2) Press it slowly to the DIN rail until it clicks.

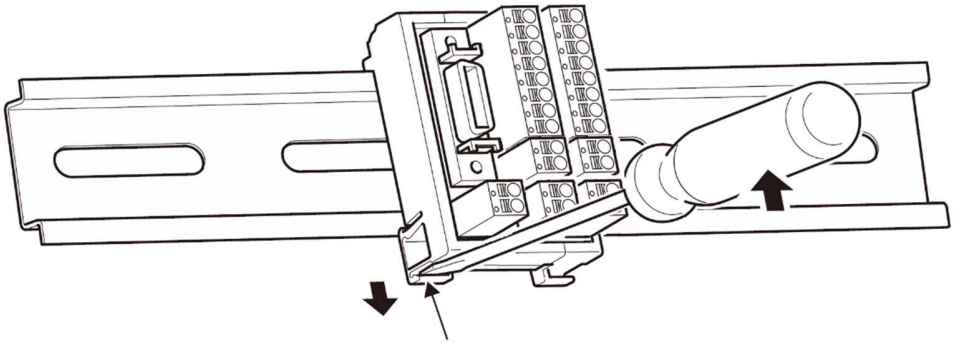


(2) Dismounting from DIN rail

1) Use the flat head screwdriver to operate one of the removal hooks and hold the unit as one side is off from the DIN rail.

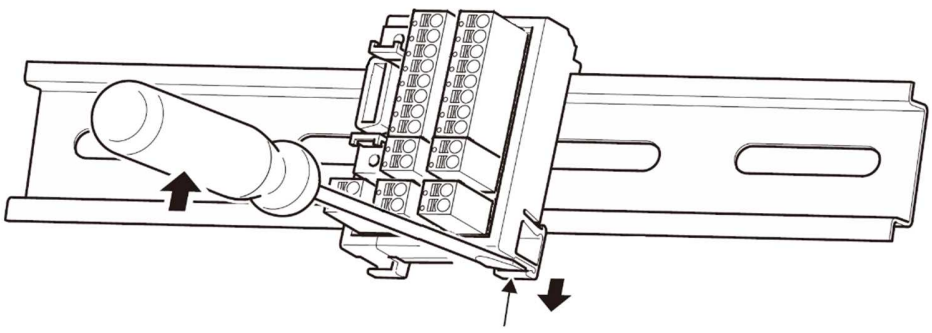
2) Operate another removal hook and remove the unit from the DIN rail.

1)



Operate the removal hook and hold the unit as one side is off from the DIN rail.

2)



As one side is off from the DIN rail, operate another removal hook.

6-4. Inspection items

It is recommended that the following points periodically be checked.

(1) Check the cables and the like for scratches or cracks.

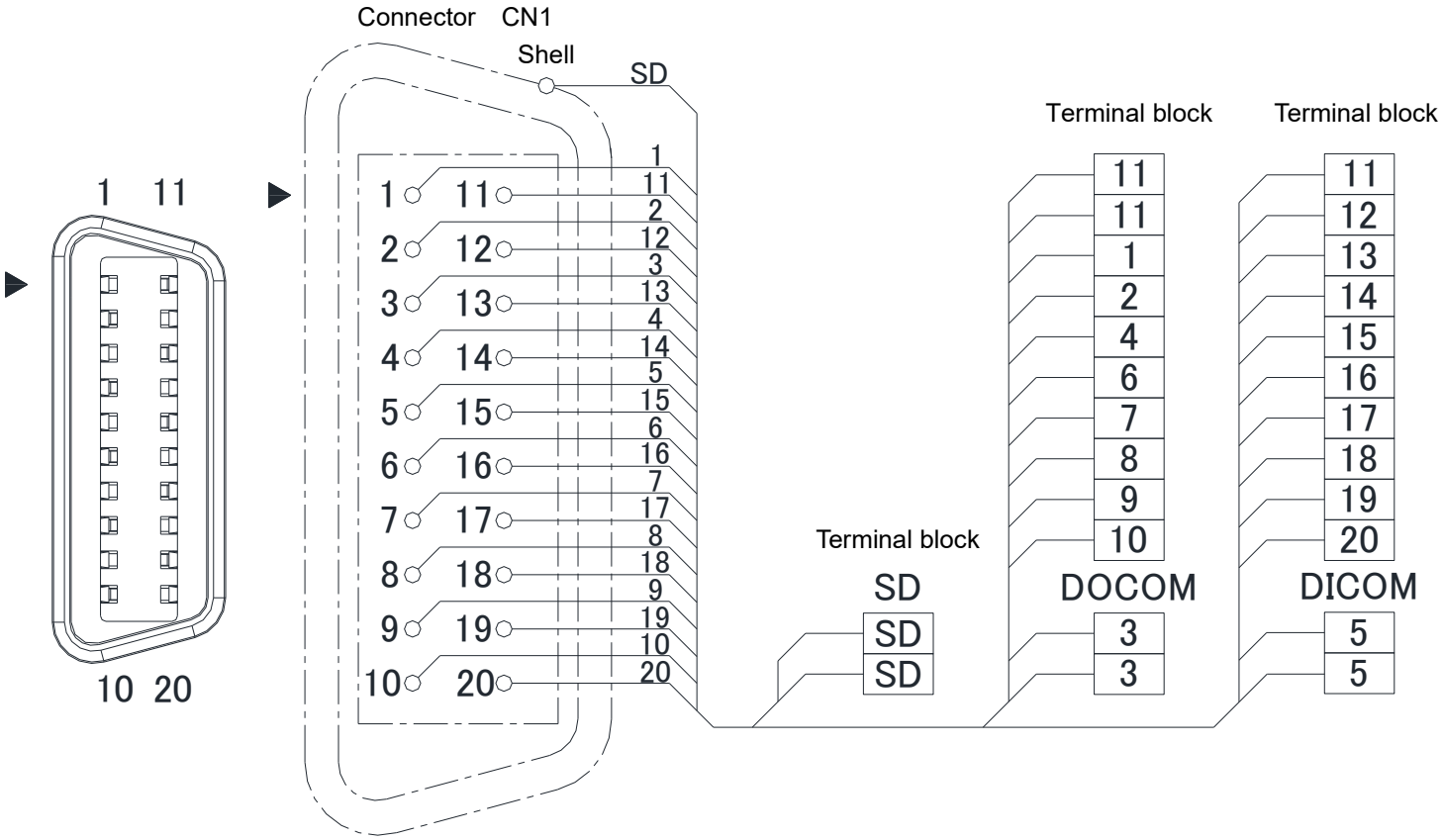
(2) Check that the cable connector is securely connected.

(3) Check that the wires are not coming out from the connector.

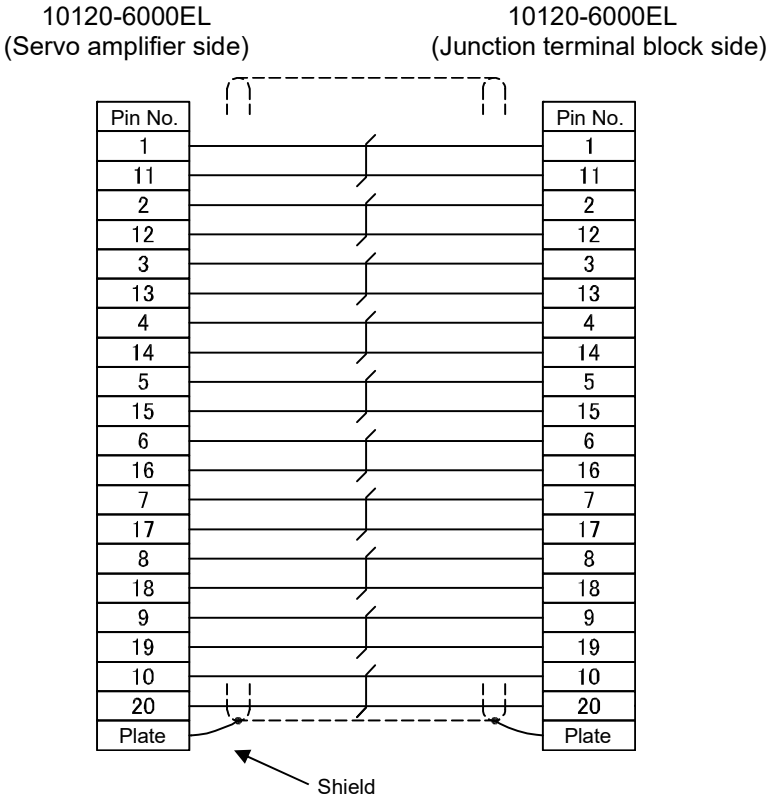
(4) Check for dust accumulation on the terminal block.

7. CONNECTION DIAGRAM

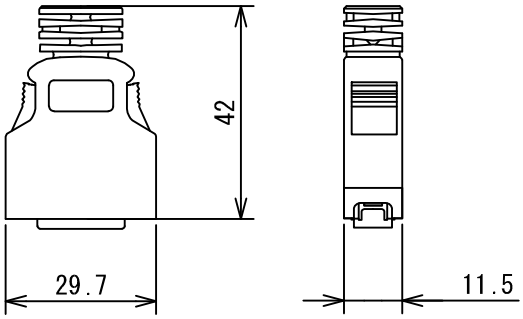
7-1. Internal connection diagram of DG2SV3TB



7-2. Connection diagram of connection cable DG4SV2CB_



7-3. Connector dimensions of connection cable



	Connector	Shell kit	Manufacturer
Junction terminal block side / Servo amplifier side	10120-6000EL	10320-3210-000	3M Japan Limited

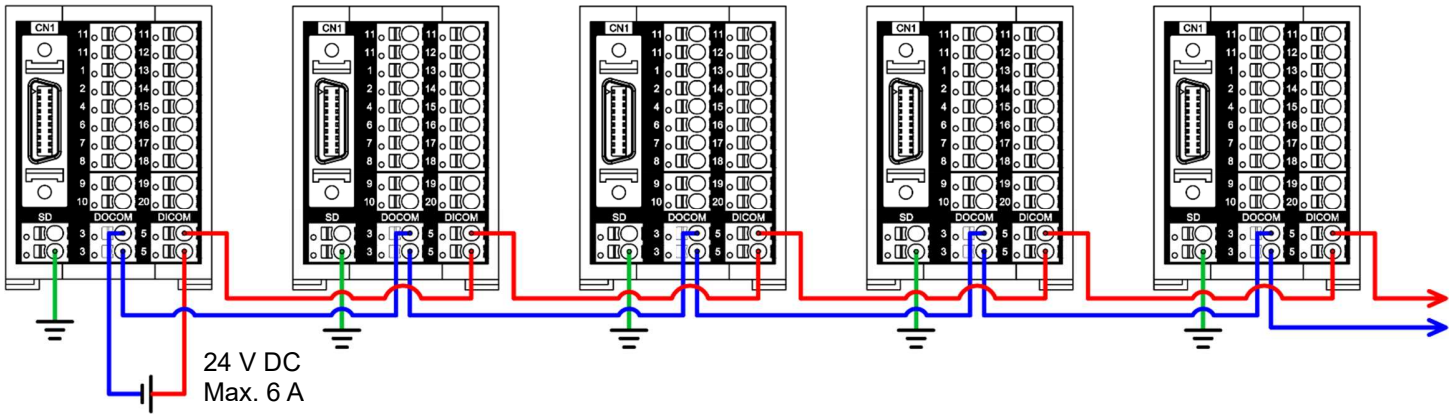
[Unit: mm]

8. EXTERNAL CONNECTION EXAMPLE

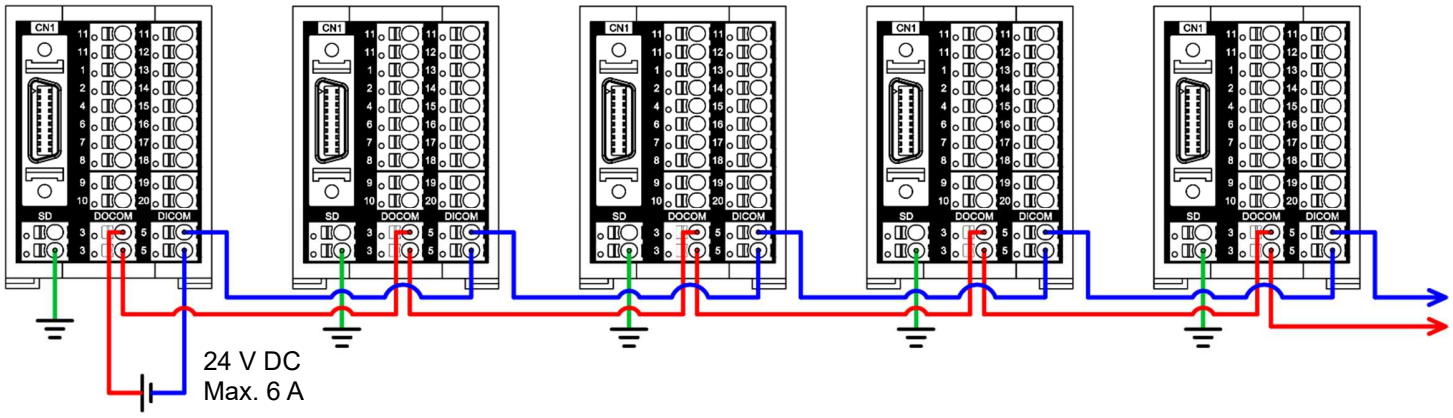
8-1. Digital I/F power supply branch

Up to 6 A of the servo amplifier digital I/F power supply can be branched.

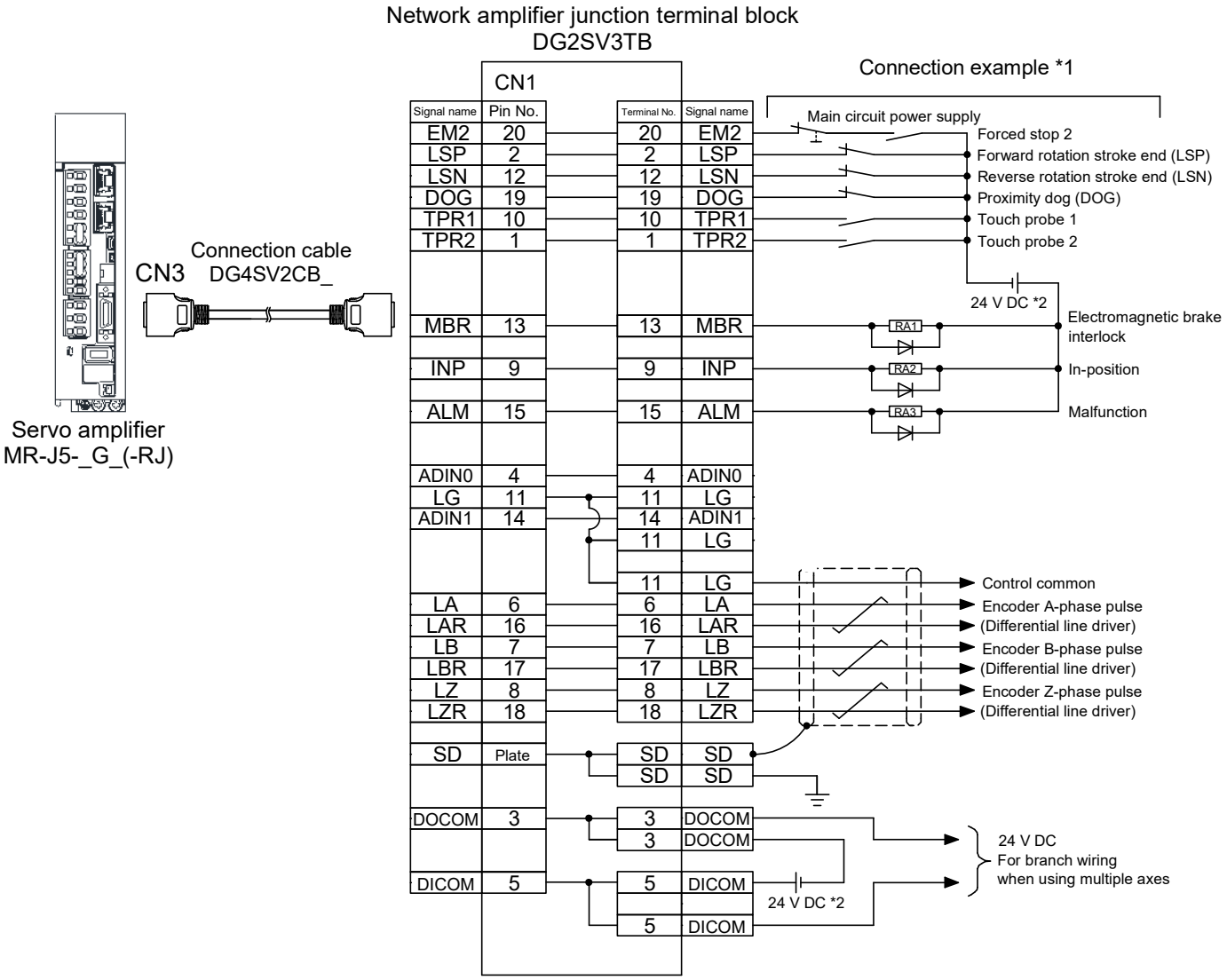
(1) For sink I/O interface



(2) For source I/O interface

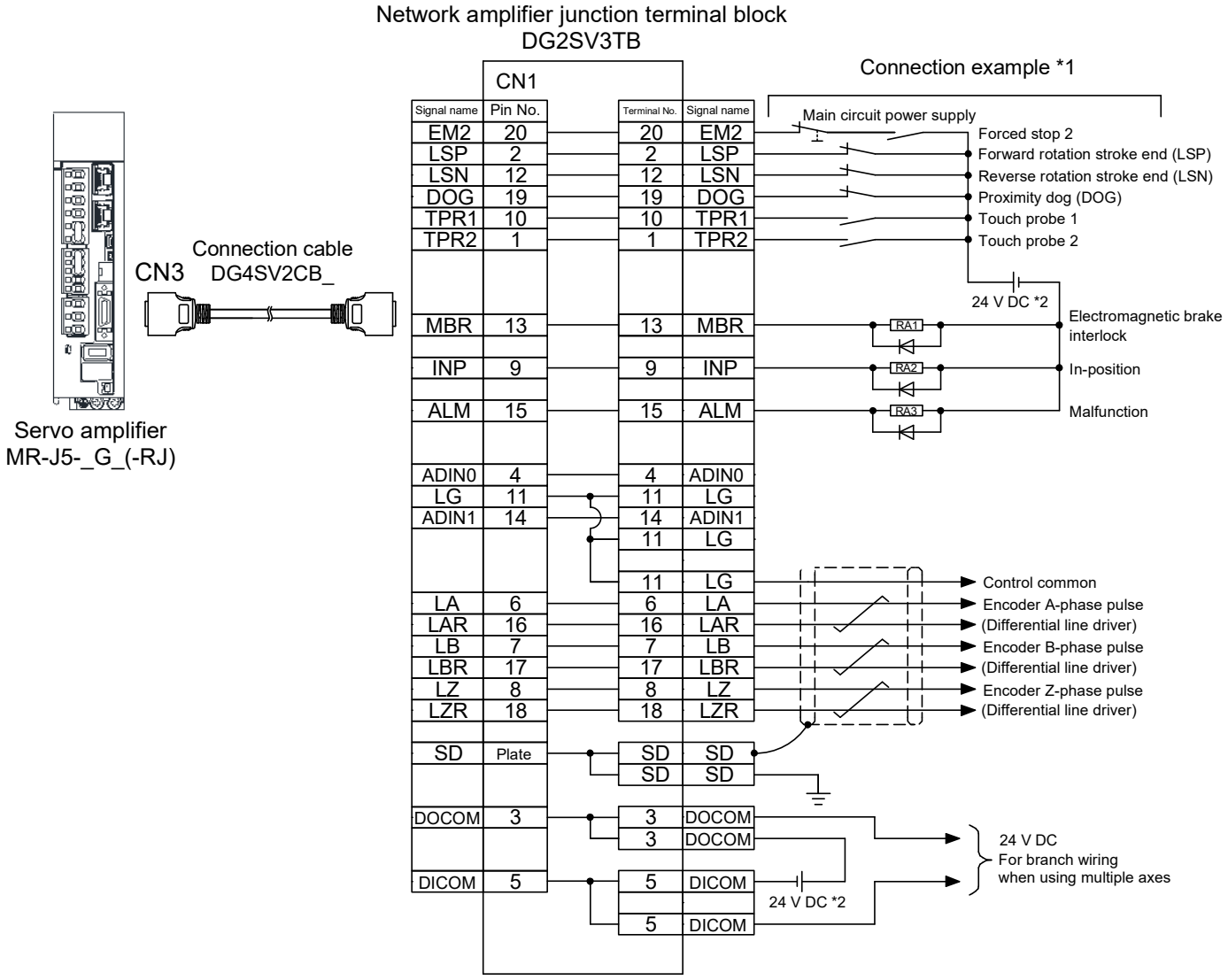


8-2 When connecting MR-J5-_G_(-RJ)
1) For sink I/O interface



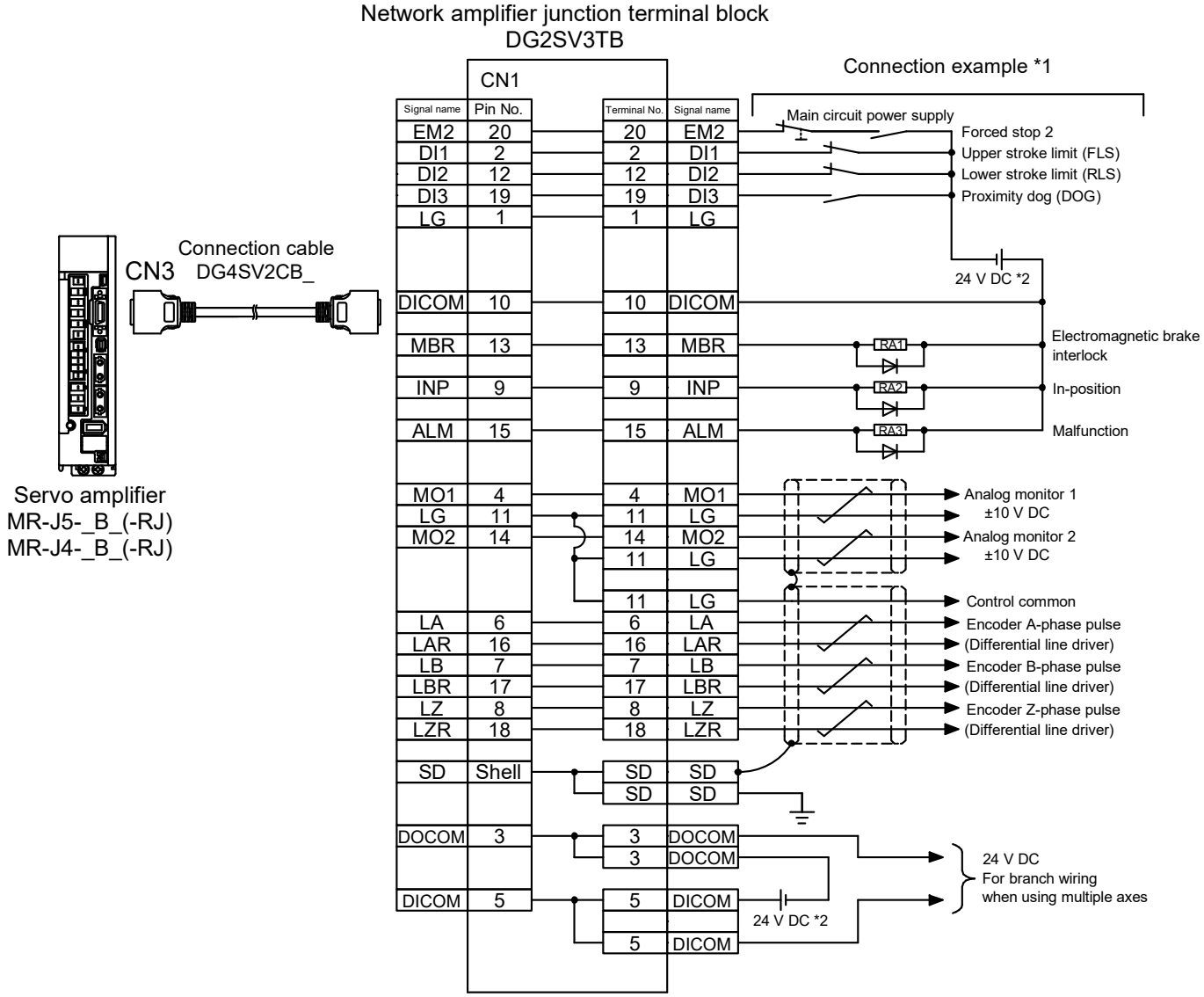
*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

2) For source I/O interface



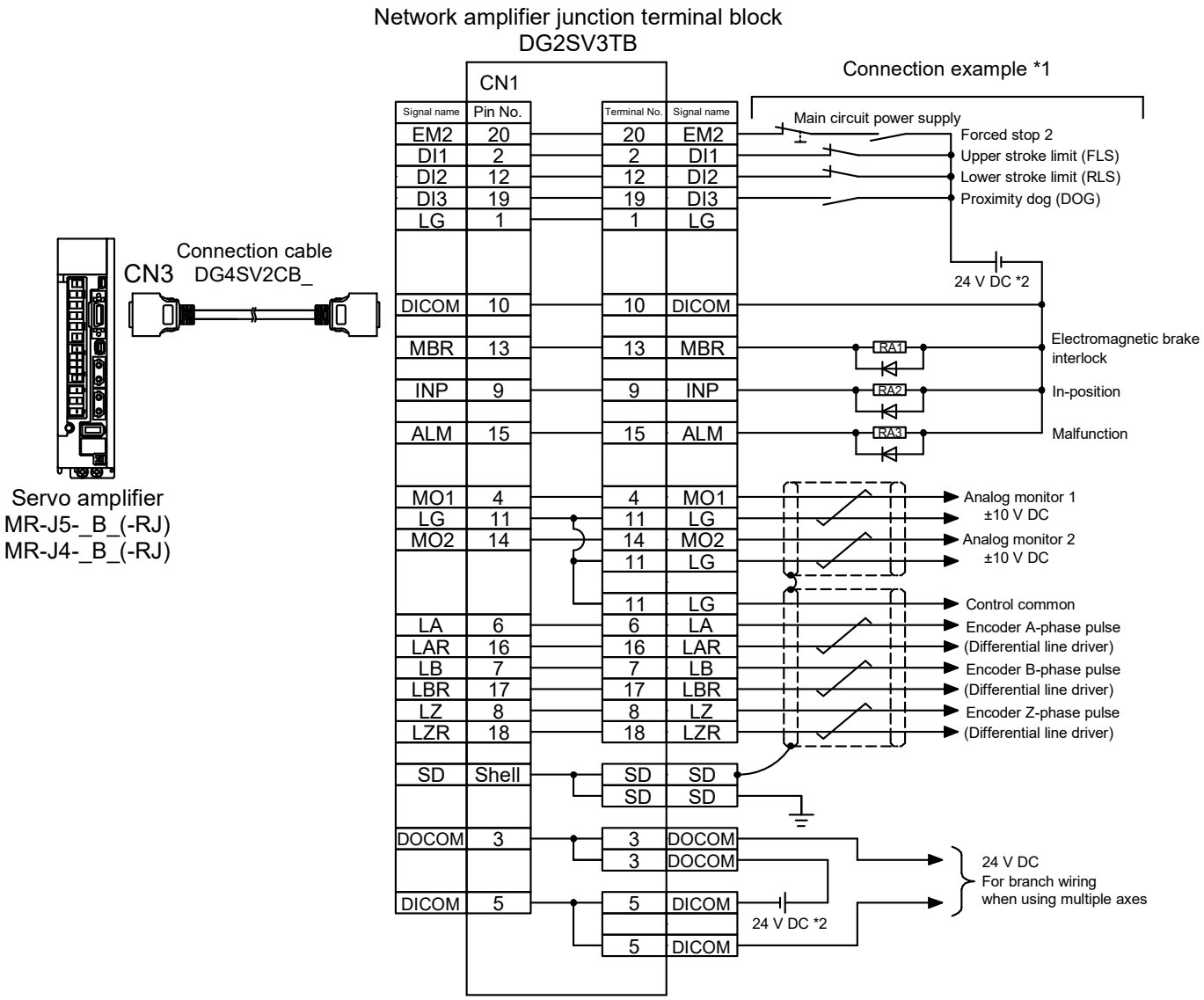
*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

8-3. When connecting MR-J5-_B_(-RJ), MR-J4-_B_(-RJ)
1) For sink I/O interface



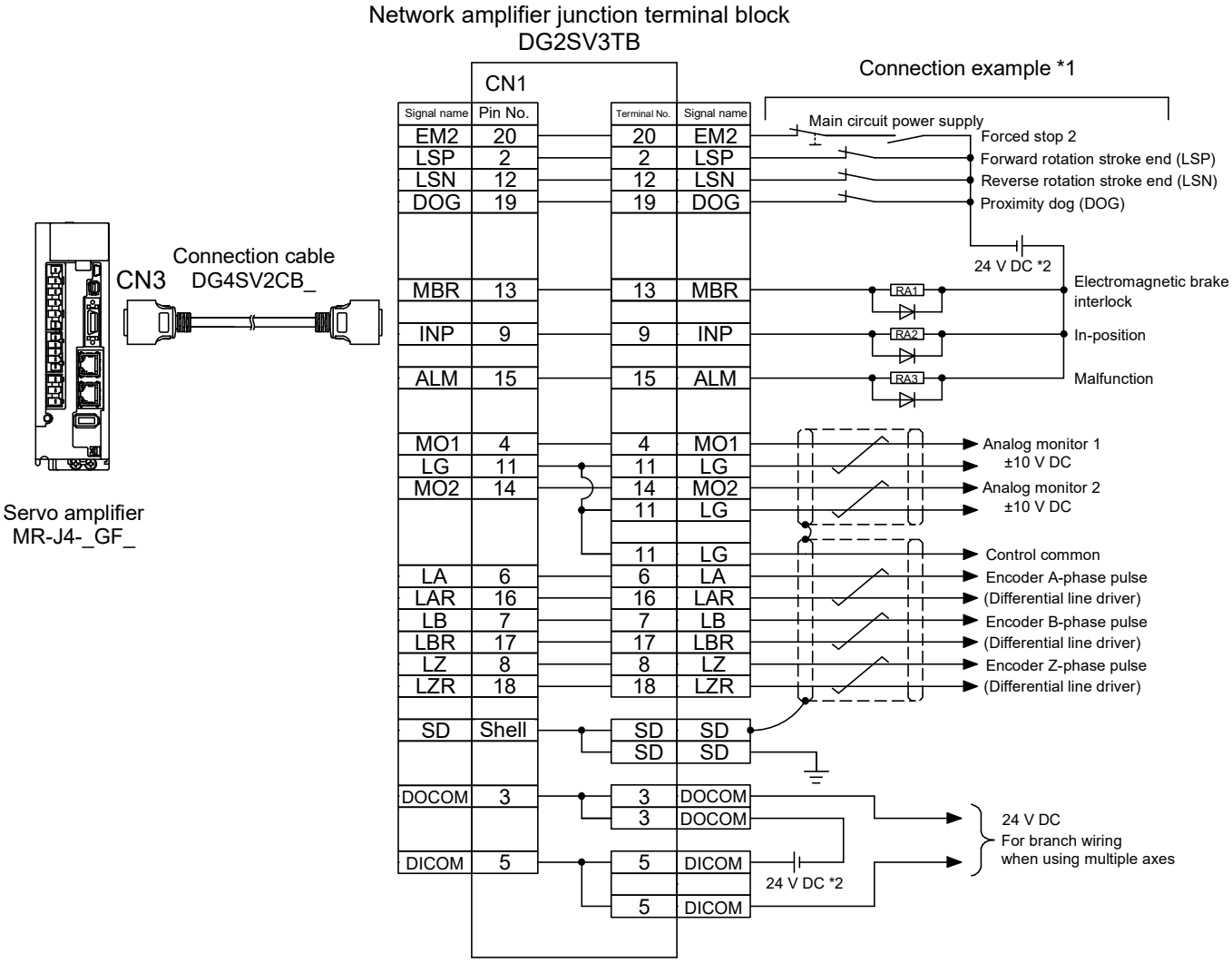
*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

2) For source I/O interface



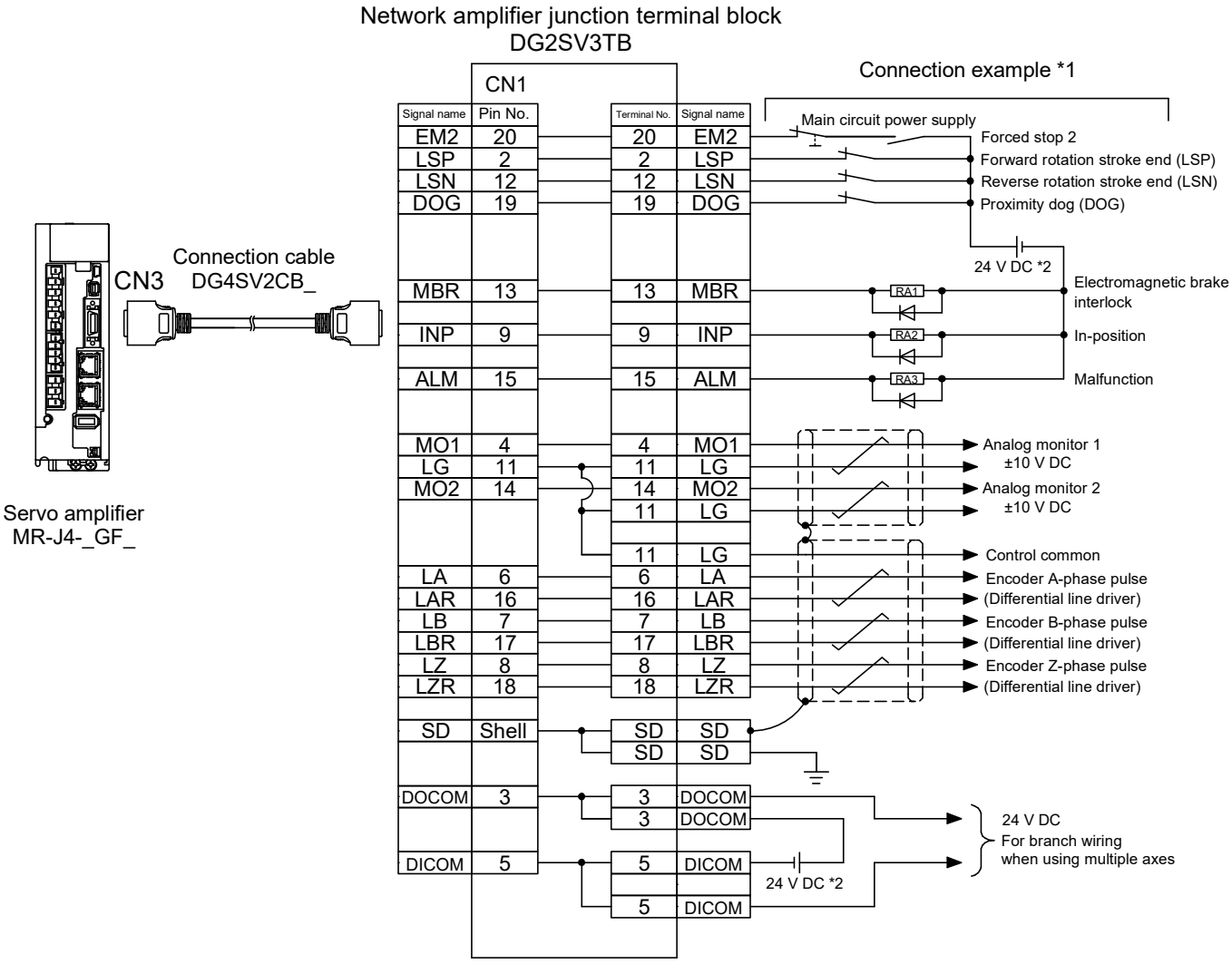
*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

8-4. When connecting MR-J4-_GF_
1) For sink I/O interface



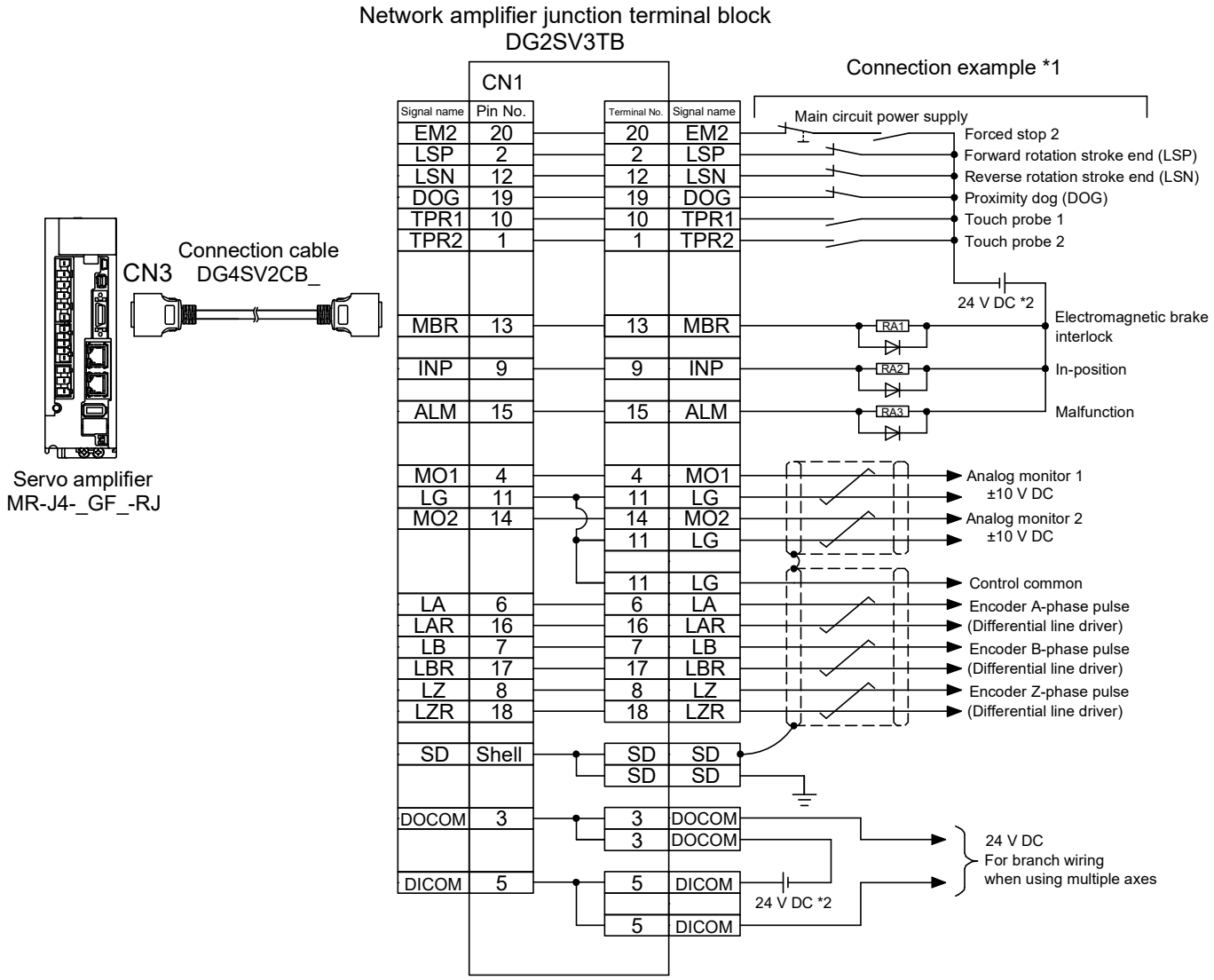
*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

2) For source I/O interface



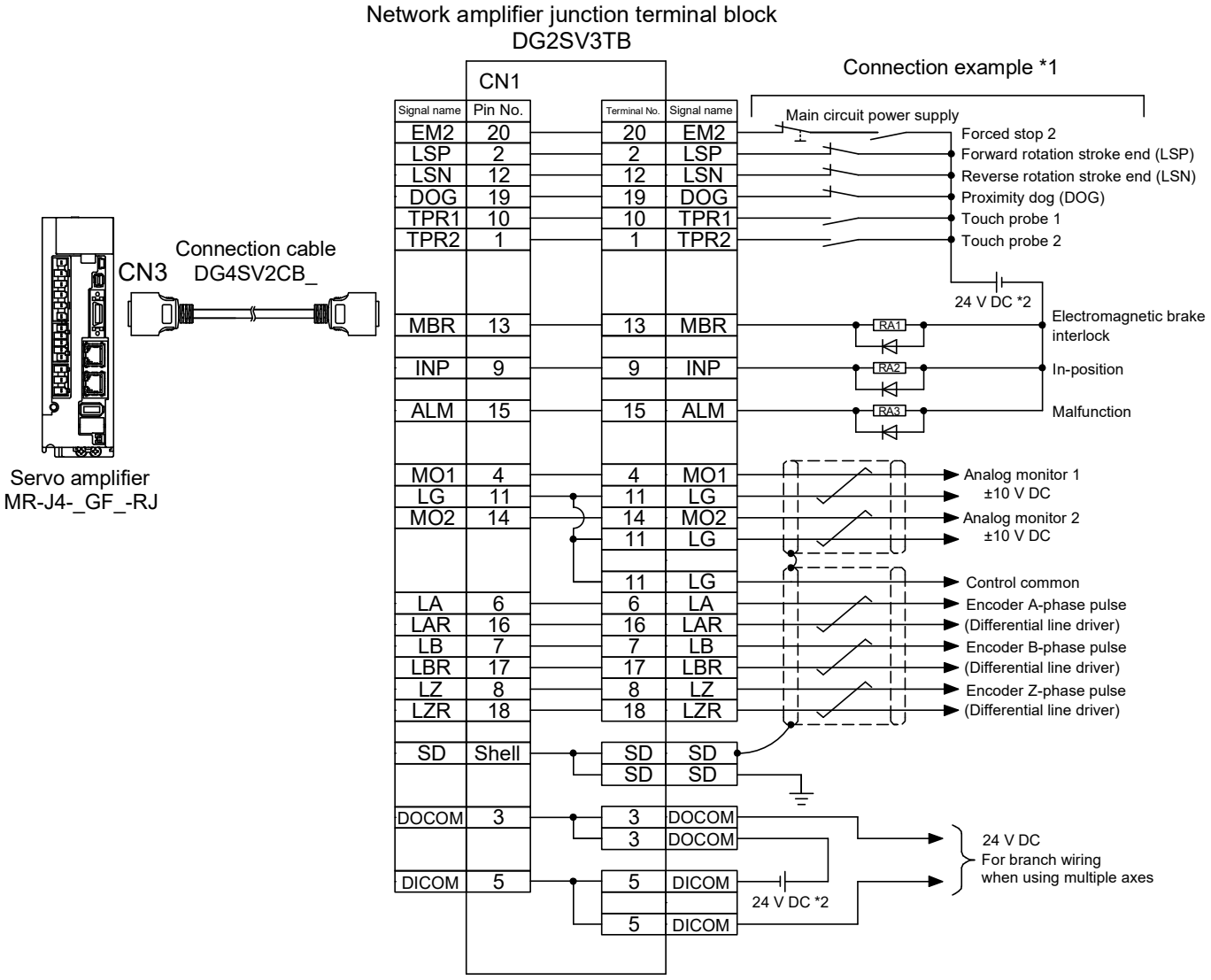
*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

8-5. When connecting MR-J4-_GF_-RJ
1) For sink I/O interface



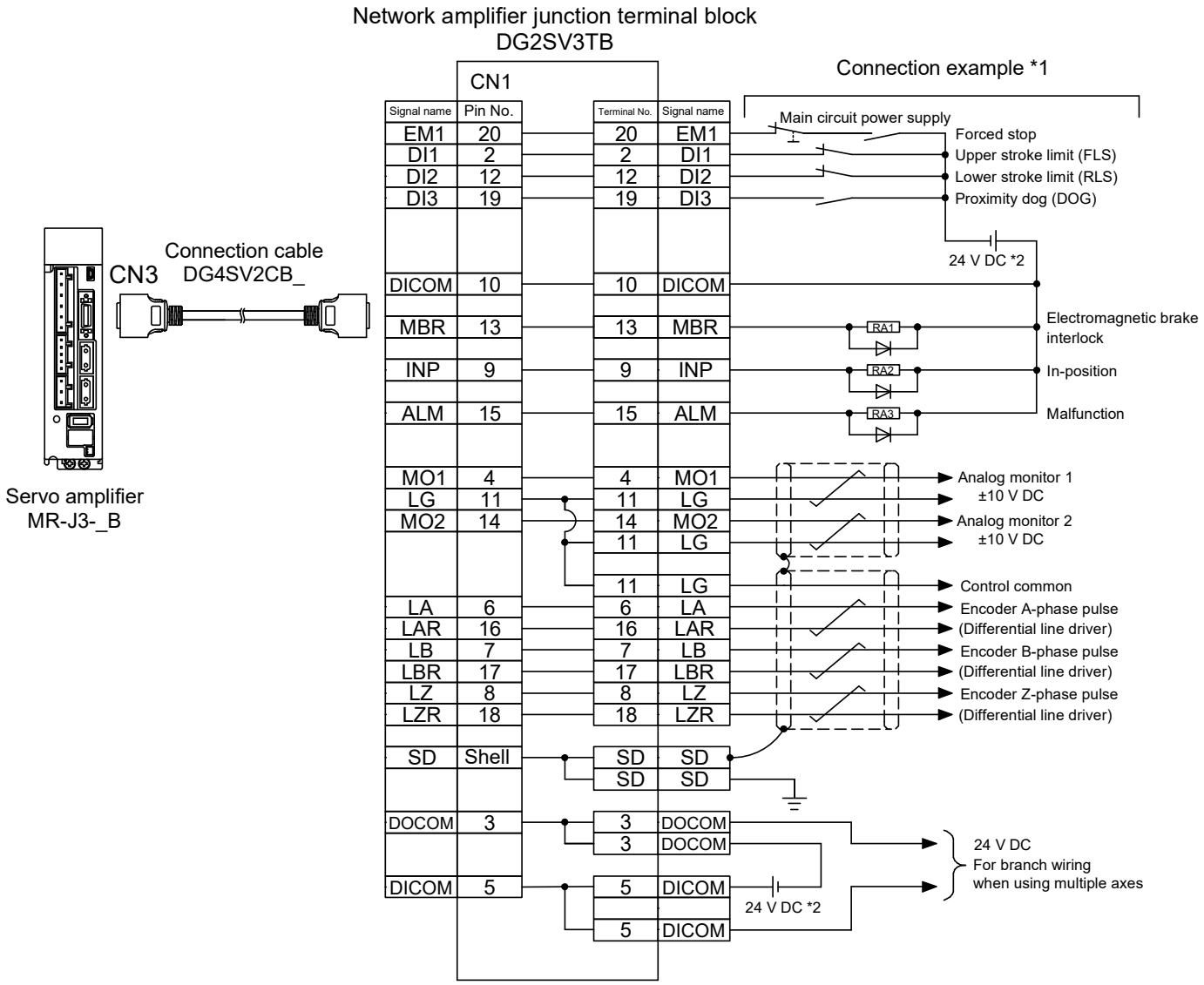
*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

2) For source I/O interface



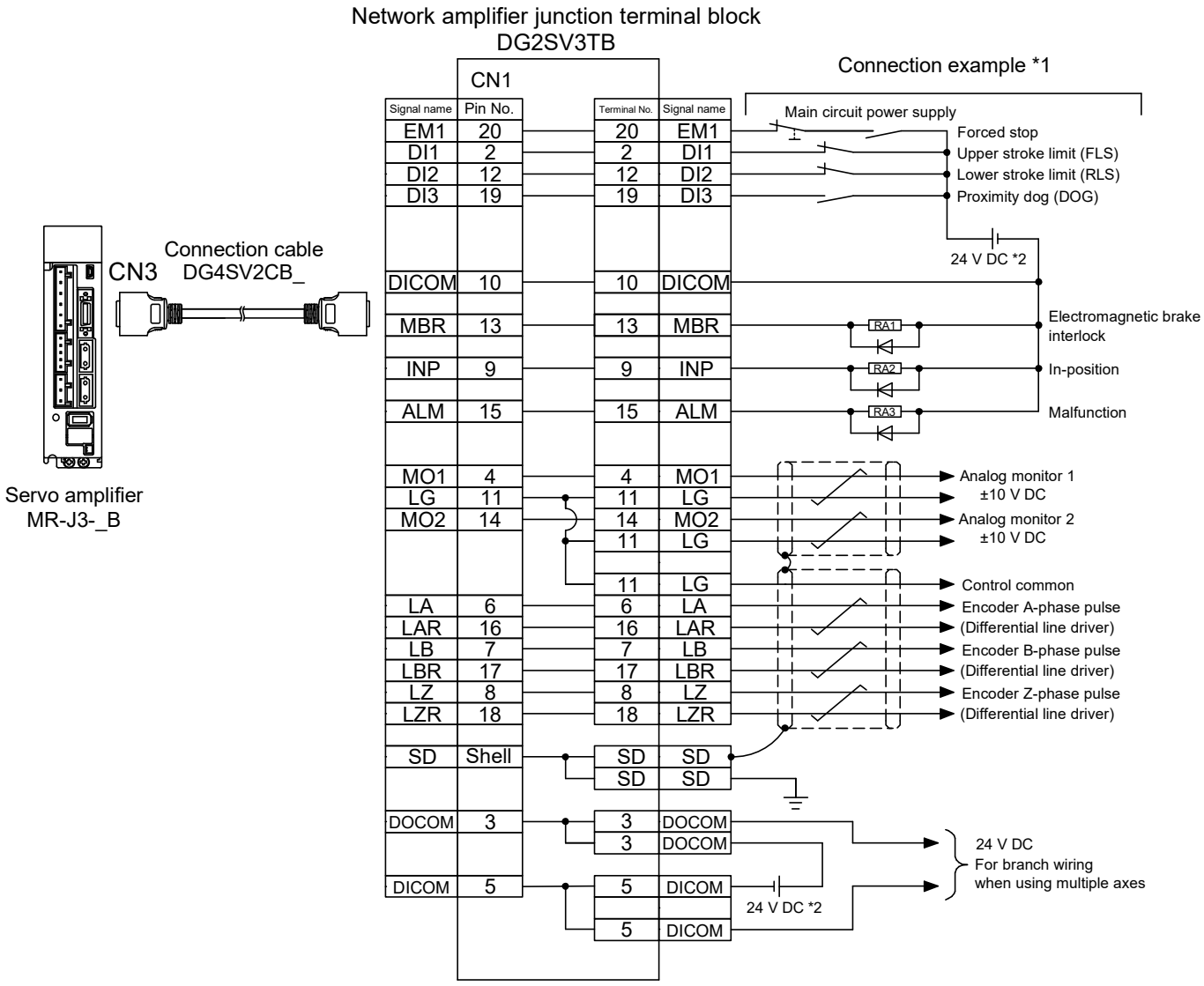
*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

8-6. When connecting MR-J3-_B
1) For sink I/O interface



*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

2) For source I/O interface



*1: Always refer to each servo amplifier instruction manual and servo motor instruction manual to carry out wiring.
*2: The illustration of the 24 V DC power supply is divided between input signals and output signals for convenience. However, they can be configured by one.

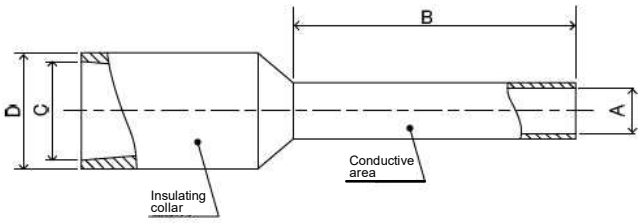
9. APPLICABLE CRIMP TERMINAL

Type		Applicable ferrule terminal	Crimping tool
Manufacturer	Applicable wire size		
WAGO Company of Japan, Ltd	0.08 mm^2 to 0.34 mm^2/ AWG 28 to 22	216-302	206-220
	0.34 mm^2 / AWG 24 and 22	216-302	206-204
	0.5 mm^2 / AWG 22 and 20	216-201	
	0.75 mm^2 / AWG 20 and 18	216-202	

*: The solid wire and stranded wire used are the UL-certified products.

● Ferrule dimensions [Unit: mm]

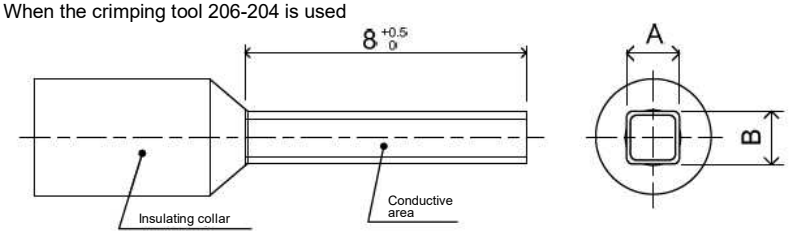
(1) Dimensions before crimping



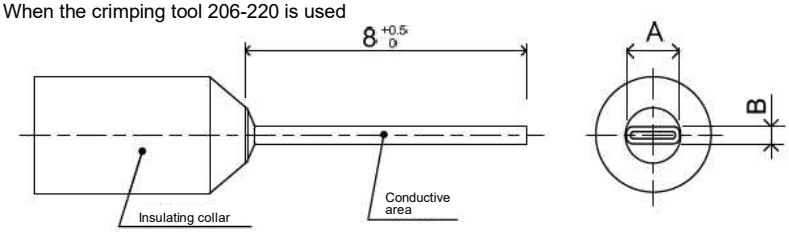
Dimensions				
	A	B	C	D
MAX	1.3	8	2.8	3.5
MIN	0.8	8	2.0	-

(2) Dimensions after crimping

1) When the crimping tool 206-204 is used



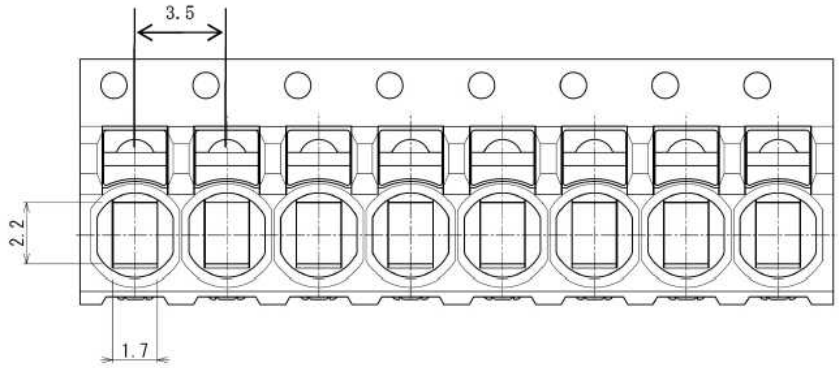
2) When the crimping tool 206-220 is used



Dimensions*1		
	A	B
MAX	1.6	1.6
MIN	0.3	0.3

*1: The dimensions must not be smaller than 0.48 mm^2.

● Shape of terminal block [Unit: mm]



[Warranty]

1. Warranty period and coverage
   If any failure or defect hereinafter referred to as "failure" in our FA equipment hereinafter referred to as the "Product" has arisen during warranty period due to causes for which we are responsible, we will offer a substitute for the defective Product at no charge in exchange for the Product through the distributor from which you purchased the Product.
   We are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit are repaired or replaced.

[Term]

The term of warranty for Product is twelve (12) months after your purchase or delivery of the Product to a place designated by you or eighteen (18) months from the date of manufacture whichever comes first ("Warranty Period").
Warranty period for repaired Product cannot exceed beyond the original warranty period before any repair work.

[Limitation]

(1) This limited warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual and User's Manual for the Product.

(2) Even during the term of warranty, the replacement cost will be charged on you in the following cases:
   (i) a failure caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software problem
   (ii) a failure caused by any alteration, etc. to the Product made on your side without our approval
   (iii) a failure recognized as avoidable if your equipment in which the Product is incorporated is equipped with a safety device required by applicable laws, or has any function or structure considered to be indispensable according to a common sense in the industry
   (iv) a failure recognized as preventable if consumable products specified in the instruction manual, etc. were normally maintained and replaced.
   (v) any replacement of consumable parts (relays, etc.)
   (vi) a failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquake, lightning and natural disasters
   (vii) a failure generated by an unforeseeable cause with a scientific technology that was not available at the time of the shipment of the Product from our company
   (viii) any other failures which we are not responsible for or which you acknowledge we are not responsible for

2. Term of warranty after the stop of production
   (1) We may accept the repair at charge for another seven (7) years after the production of the Product is discontinued.
   The announcement of the stop of production for each model can be seen in our website MEEFAN.
   (URL: https://www.mee.co.jp/sales/fa/meefan/)
   (2) Please note that the Product (including its spare parts) cannot be ordered after its stop of production.

3. Service in overseas countries
   Service in overseas countries is out of the warranty.

4. Exclusion of loss opportunity and secondary loss from warranty liability
   Regardless of the gratis warranty term, Mitsubishi Electric Engineering shall not be liable for compensation to: damages caused by any cause found not to be the responsibility of Mitsubishi Electric Engineering, loss in opportunity and lost profits incurred to the user by failures of Mitsubishi Electric Engineering products, special damages and secondary damages whether foreseeable or not, compensation for accidents, compensation for damages to products other than Mitsubishi Electric Engineering products, replacement by the user, maintenance of on-site equipment, start-up test run, and other tasks.

5. Change of product specifications
   Specifications listed in our catalogs, manuals or technical documents may be changed without notice.

6. Conditions of use for the product
   (1) For the use of this Product, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in the equipment, and a backup or fail-safe function should operate on an external system to the equipment when any failure or malfunction occurs.

(2) This Product is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for railway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used. In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used.

Note that if the user consults with Mitsubishi Electric Engineering customer service in advance with regard to such an application and the user accepts that the application is to be limited and a special quality is not to be required, application shall be made possible upon exchange of required documents.

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED

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