Regeneration and Communication Unit TA8413
Instruction Manual

DS'S
CH'D
APP'D

Motortronics®

Tamagawa

Built-in SV-NET & RS232C Conversion Function Regeneration and Communication Unit

TA8413

Instruction Manual

Tamagawa TAMAGAWA SEIKI CO.,LTD

■ Contents

Safety Precautions

To use the product correctly, please read this document and all supplied documents carefully before installing, operating, maintaining, and inspecting the product. Incorrect usage may lead to improper operation, and, at worst, can lead to damage to the product or the equipment connected to it. Store this manual with the supplied documents in a safe place so that you can refer to it when you have a question.

We exercise the greatest caution to ensure the product quality. However, please give due consideration to safety because unanticipated operation may occur due to unexpected noises, static electricity, accidental part failure, wiring failure, or other problems.

■ Items to Check after Unpacking

After you receive and unpack the product, please check it to see if it is the model you have ordered and for any damage that may have occurred during transportation. Should your product have any problems, please contact the dealer from whom you purchased the product.

■ Precautions for Transportation and Handling

- Do not drop the product by mistake or subject it to excessive impact.
- During transportation, handle the product carefully to avoid breakage.
- Do not handle the product in a way that may allow excessive force to be applied to its parts.
- Do not allow conductive foreign materials such as screws and metal pieces or flammable foreign materials such as paper to get onto the circuit boards or enter the inside of the product.

■ Precautions for Wiring and Installation

- Store and use the product under the following environmental conditions unless otherwise specified:

Environmental condition	Regeneration and Communication Unit TA8413
Operating temperature range	0°C to +40°C
Operating humidity	90% RH or less (no condensation)
Storage temperature	−10°C to +70°C (no freezing)
Storage humidity	90% RH or less (no condensation)
Environment	Indoor (no direct sunlight) Avoid dirt, dust, and corrosive and flammable gasses 1,000 m or less above sea level
Vibration/shock	4.9 m/s^2 or less / 19.6 m/s^2 or less

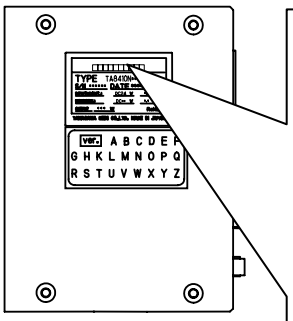
- Do not apply a voltage to the terminals other than that specified in the specifications. Doing so could result in product breakdown or damage.
- Recheck the wiring and the polarity of the connections before turning on the product.
- The vibration/shock values are short-time ratings.

Safety Precautions

■ Model check

When you receive the product, check the model of the unit.

The model is given on the nameplate located on the rear of the product.



Model designation

TA8413 N * * E * * *
(1) (2) (3) (4)

(1) Model base
TA8413 Series

(2) Power supply specifications
1: 24 V, no communication function
2: 24 V, with communication function (standard specification)
3: 48 V, no communication function
4: 48 V, with communication function (standard specification)

(3) Regeneration resistor value
0: No resistor mounted
1: 15 W; 6.8 Ω × 2 (for 24 V)
2: 15 W; 13 Ω × 2 (for 48 V)

(4) Software specification
No code number (standard specification)

■ Power Supply to Be Used

To check the power supply voltage, see the power supply specification for the model (N**).

Use the product at ±10% the power supply specification value (24 V or 48 V DC).

To operate the driver with a motor connected, provide a power supply that can supply enough power supply input current.

A shortage in the power supply capacity may reduce the motor output or cause the driver to raise a low-voltage alarm.

Select a power supply with a capacity sufficient to supply a current at least 1.4 times the instantaneous current (Arms) of the motor.

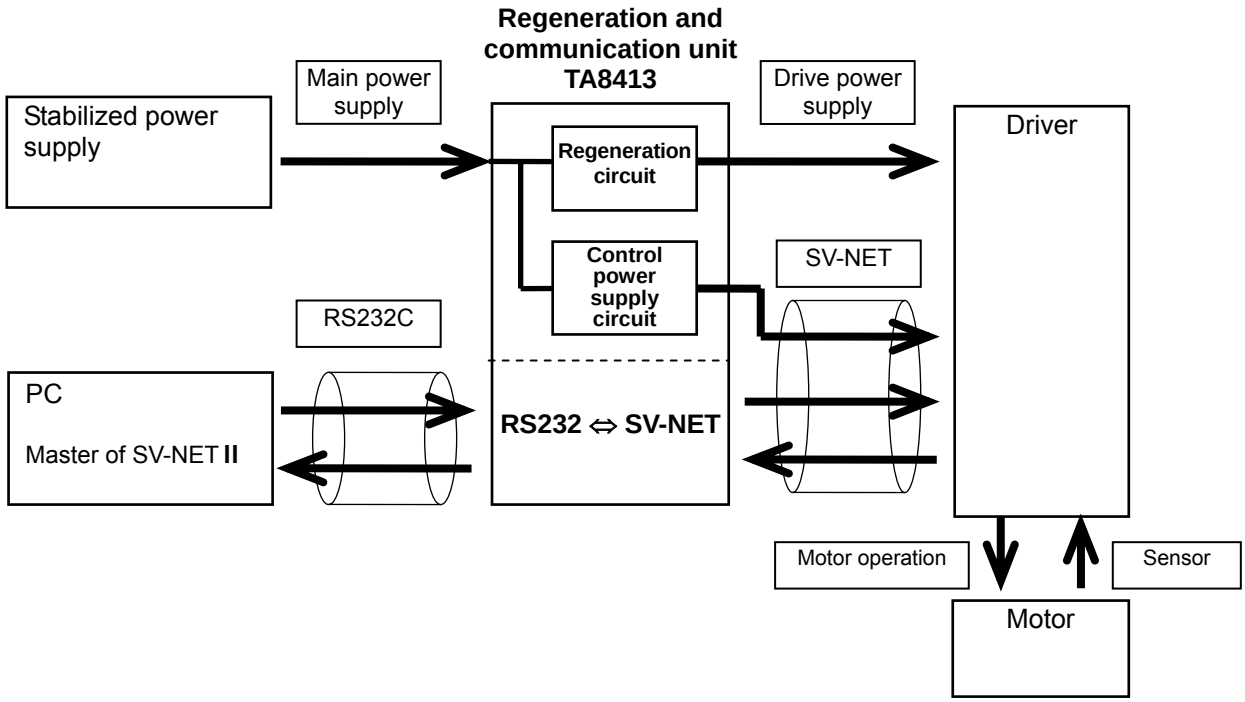
The model is given on the nameplate located on the rear of the product.

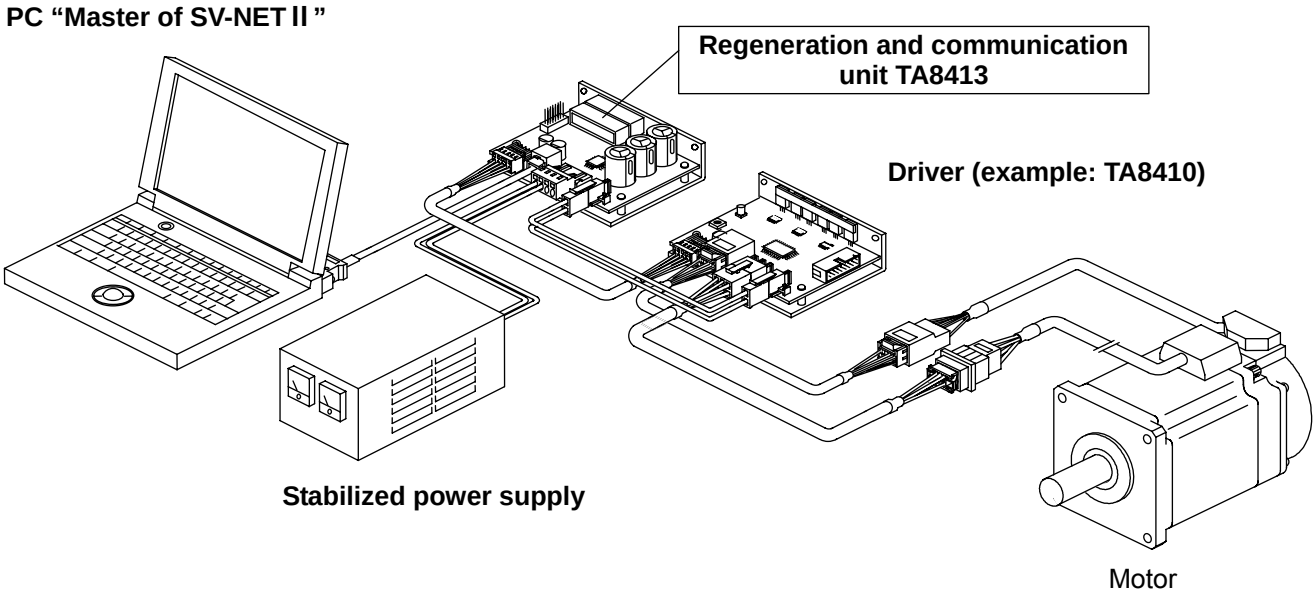
1. Before Use

Overview of the Product

The regeneration and communication unit TA8413 is equipped with a regeneration protection function that safely processes the excess regeneration energy generated during motor operation. The control power supply circuit is also built in, simplifying the wiring of the power supply. In addition to the regeneration protection function, it is also equipped with a communication function which mutually converts between SV-NET and an RS232C interface.

The regeneration protection function and the function for conversion between SV-NET and RS232C can be used individually. Both a 24-V type and a 48-V type regeneration protection circuit are available. Please check the voltage specifications, as they vary according to the model (See page 4). Use the conversion function between SV-NET and RS232C to connect the SV-NET communication software "Master of SV-NET Ⅱ" to a SV-NET compatible motor driver.

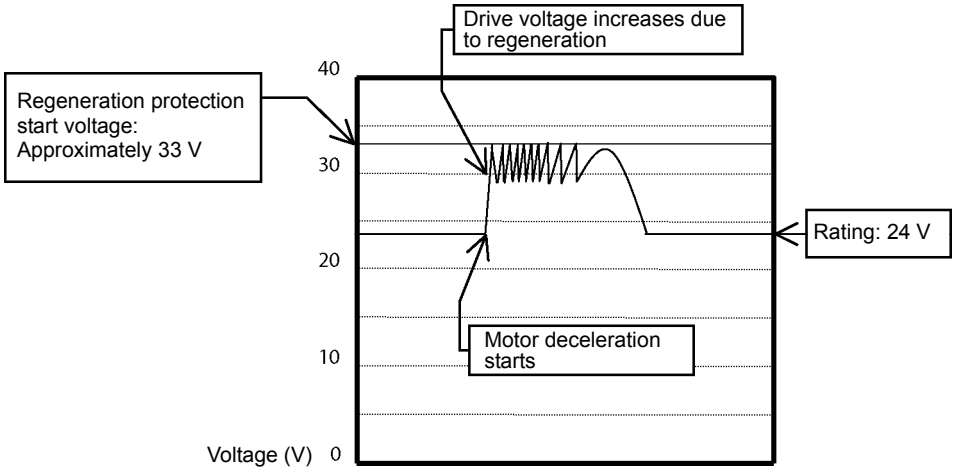




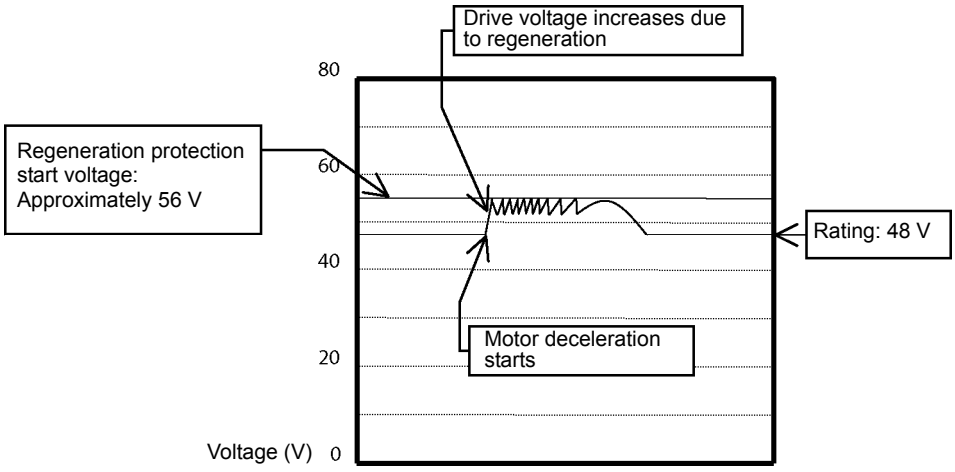
Regeneration

Applying a sudden deceleration or external rotation torque may subject the motor to a counter electromotive force due to regeneration effects, resulting in a rise in the drive voltage. The regeneration and communication unit is equipped with a function that protects the driver and motor by controlling such a rise in the drive voltage (regeneration protection function).

■ **Motor drive voltage during regeneration: 24-V type (N11/N21)** (Example: During a sudden deceleration)



■ **Motor drive voltage during regeneration: 48-V type (N32/N42)** (Example: During a sudden deceleration)

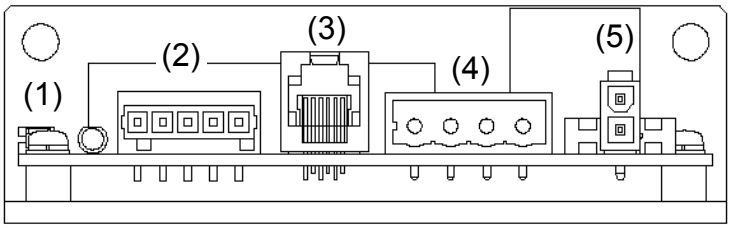


Caution!

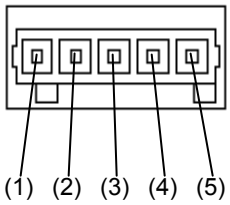
Regeneration protection may not be executed for a regeneration energy of 30 W or more. In some situations, the driver may detect a voltage error alarm. In such an event, stop the motor immediately.

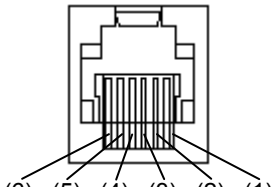
2. Names and Functions of Parts

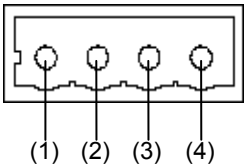
Regeneration and Communication Unit (Front Area)

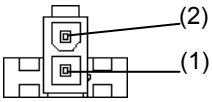


(1) LED	Function	Status	Meaning
	The communication status is indicated by three colors.	Red light ON	Power on, communication closed
		Orange light ON	RS232 communication in progress
		Green light ON	SV-NET communication in progress

(2) SV-NET connector	Use	PIN NO.	Function
	Used to output control power supply to the driver and to connect the SV-NET communication lines.	1	GND (control power supply)
		2	CAN L (-)
		3	GND (shield)
		4	CAN H (+)
		5	DC 24 V (control power supply)

(3) RS232C connector	Use	PIN NO.	Function
	RS232C connector Used to connect to a PC.	1	Vcc
		2	TXD
		3	RXD
		4	NC
		5	GND
		6	GND

(4) Main power supply connector	Use	PIN NO.	Function	
	Used to input power supply to the regeneration and communication unit. Also used to connect external regeneration resistors.		24-V type N1*/N2*	48-V type N3*/N4*
		1	GND (main power supply)	
		2	DC24V	DC48V
		3	External regeneration resistor connection	
		4	External regeneration resistor connection	

(5) Drive power supply connector	Use	PIN NO.	Function	
	Used to output drive power supply to the driver.		24-V type N1*/N2*	48-V type N3*/N4*
		1	GND (drive power supply)	
		2	DC24V	DC48V

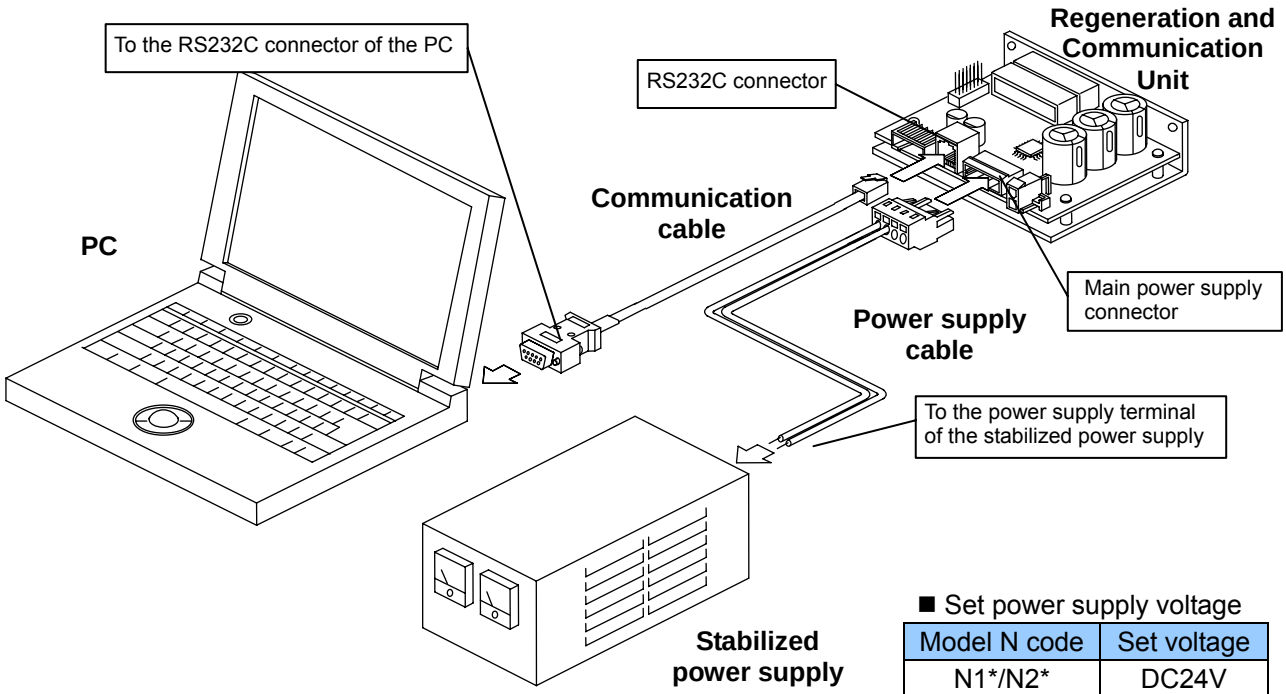
3. How to Connect

Connecting a PC and the Power Supply

Caution!

Before connecting the power supply cable, check that the supply voltage is set to the specified voltage value. Then, with the power supply turned off, perform the connection operation. To check the voltage, see the “Power supply specifications” in “Mode check” on page 4.

1. Connect the power supply cable to the stabilized power supply.
2. Connect the power supply cable to the main power supply connector of the regeneration and communication unit.
3. Connect the communication cable to a PC.
4. Connect the communication cable to the RS232C connector of the regeneration and communication unit.

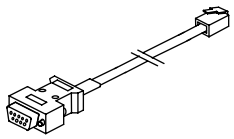


■ Set power supply voltage

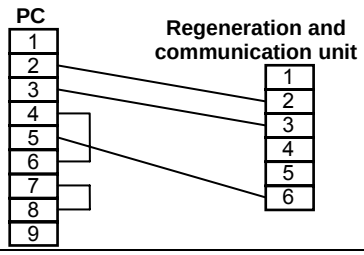
Model N code	Set voltage
N1*/N2*	DC24V
N3*/N4*	DC48V

■ Cable specifications

■ Communication cable



■ Communication diagram for communication cables

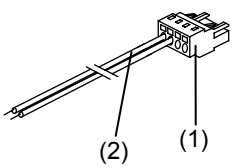


■ Communication cable product number

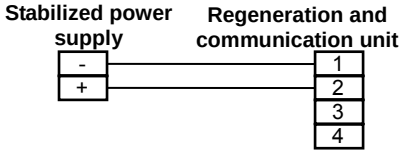
Product name: Communication cable (dedicated cable)

Product number	N code	Length	Maker
EU6517	N2	2 m	Tamagawa Seiki
	N3	3 m	Tamagawa Seiki
	N5	5 m	Tamagawa Seiki

■ Power supply cable



■ Connection diagram for power supply cables



■ Parts for power supply cable

Part name	Model or spec	Maker	Quantity
(1) Connector	231-104/026-000	WAGO	1
(2) Cable	AWG 16 or equivalent	-	2

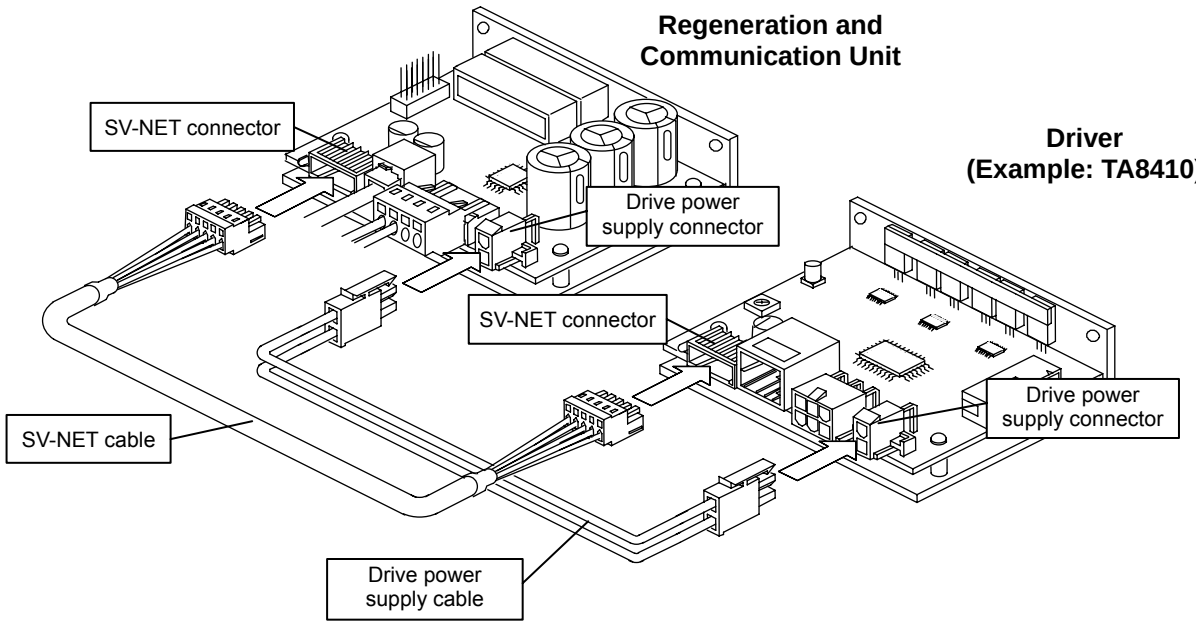
Driver Connection Example

Caution!

Before connecting the cable, check that the power supply is OFF.

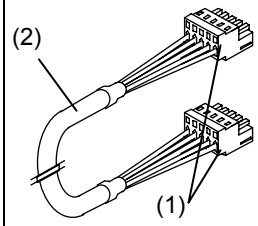
Check the instruction manual of the driver to be used for information on how to connect the driver before connecting it. This section uses the driver TA8410 as an example of how to perform the connection operation.

1. Connect the regeneration and communication unit to the SV-NET connector of the driver using the SV-NET cable.
2. Connect the regeneration and communication unit to the drive power supply connector of the driver using the drive power supply cable.



■ Cable specifications

■ SV-NET cable

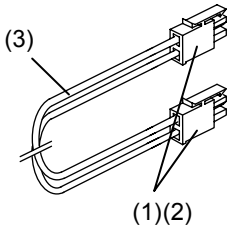


■ Connection diagram for SV-NET cables

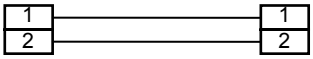
■ Parts for SV-NET cable

Part name	Model or spec	Maker	Quantity
(1) Connector	734-105	WAGO	2
(2)Twist pair shield cable	NADNR24	MISUMI	1

■ Drive power supply cable



■ Connection diagram for drive power supply cables

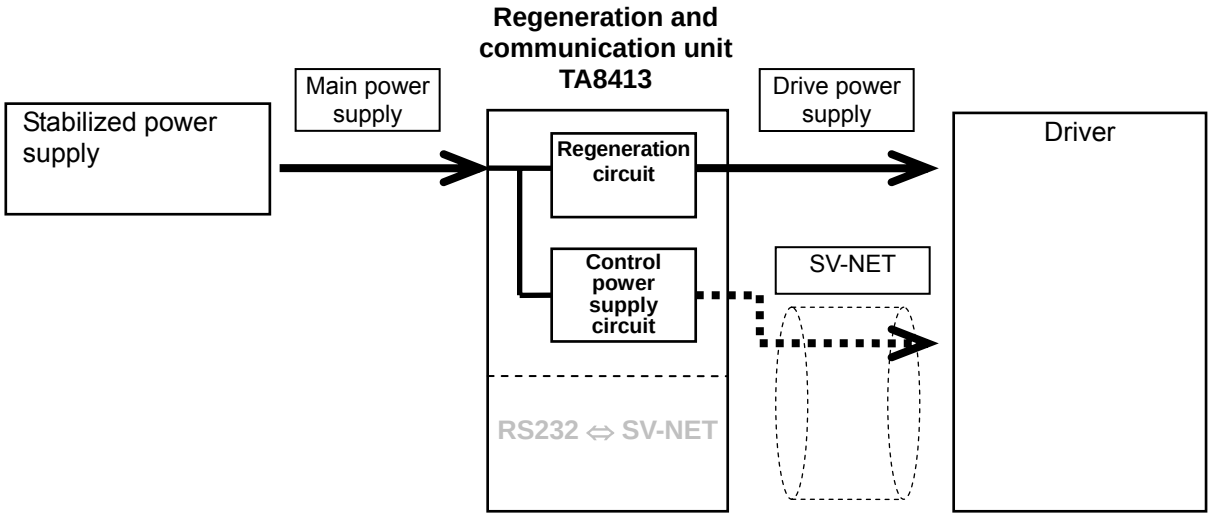


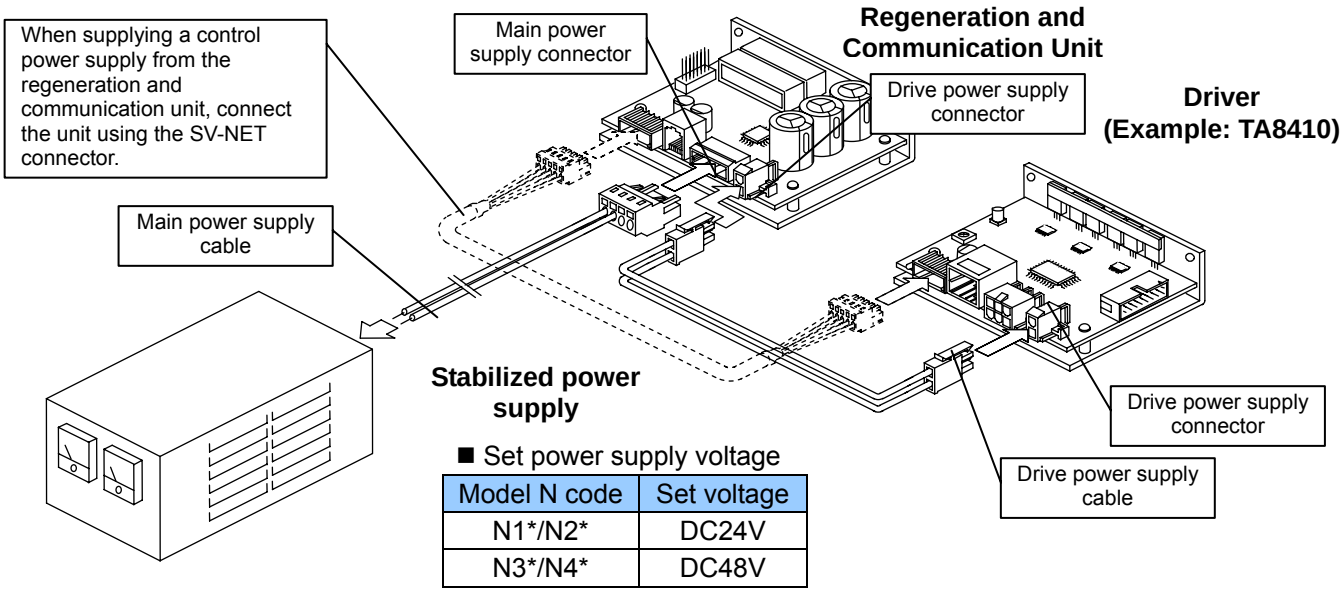
■ Parts for drive power supply cable

Part name	Model or spec	Maker	Quantity
(1) Housing	5557-02R	MOLEX	2
(2) Terminal	5556TL	MOLEX	4
(3) Cable	AWG 16 or equivalent	-	2

Connection Example of Use of the Regeneration Protection Function Only

The regeneration function can be used only by connecting the main power supply and the drive power supply. The control power supply can be also used in conjunction with these. When supplying a control power supply from the regeneration and communication unit, connect the unit using the SV-NET cable.



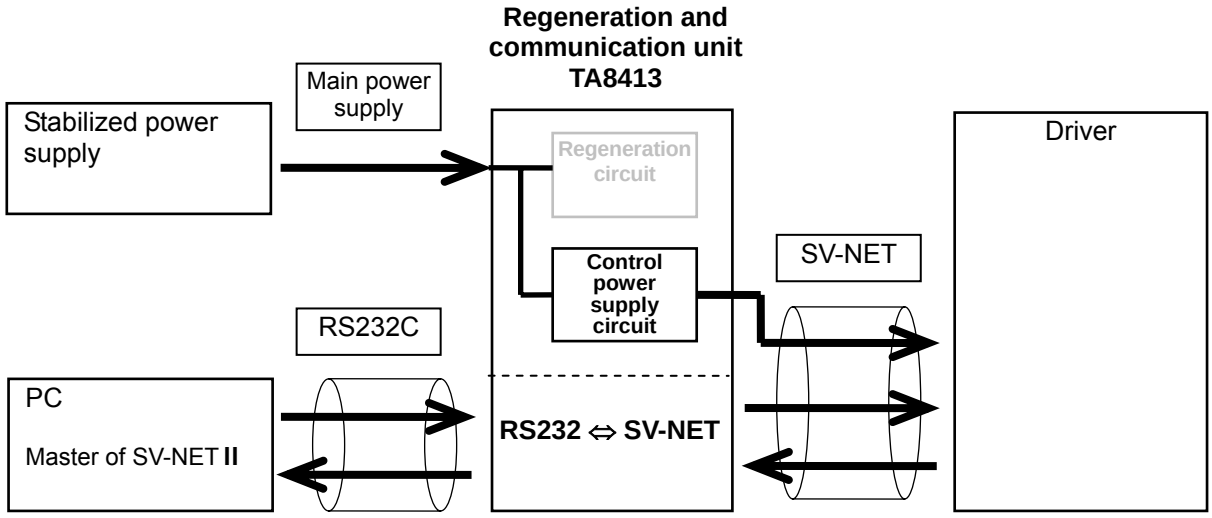


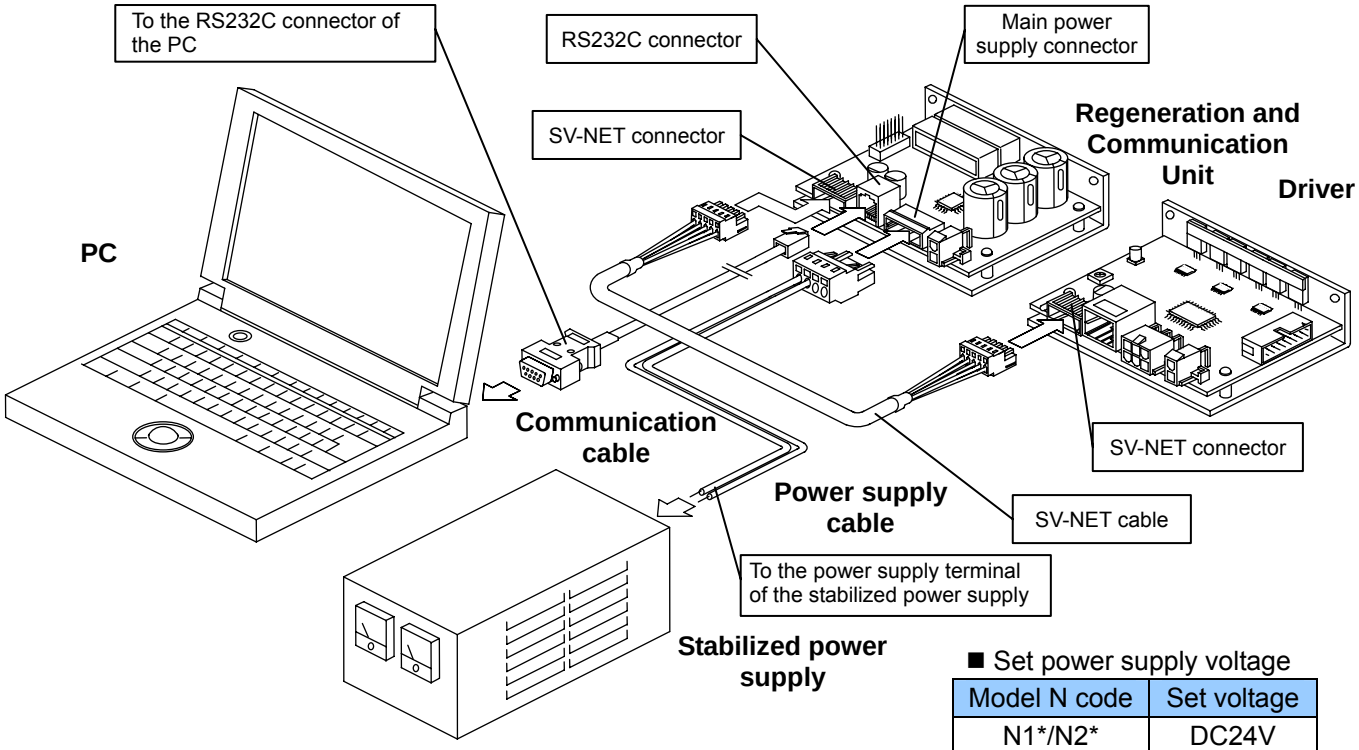
■ Set power supply voltage

Model N code	Set voltage
N1*/N2*	DC24V
N3*/N4*	DC48V

Example of Connection Using Only the Conversion Function between SV-NET and RS232C

The regeneration and communication unit can be used only for the conversion function between SV-NET and RS232C. In this case, the drive power supply cable does not necessarily need to be connected. Note that control power supply is supplied from the regeneration and communication unit. Make sure control power supply does not overlap. If the driver supplies control power supply from a connector other than the SV-NET connector, take appropriate measures such as disconnecting the connector temporarily.





■ Set power supply voltage

Model N code	Set voltage
N1*/N2*	DC24V
N3*/N4*	DC48V

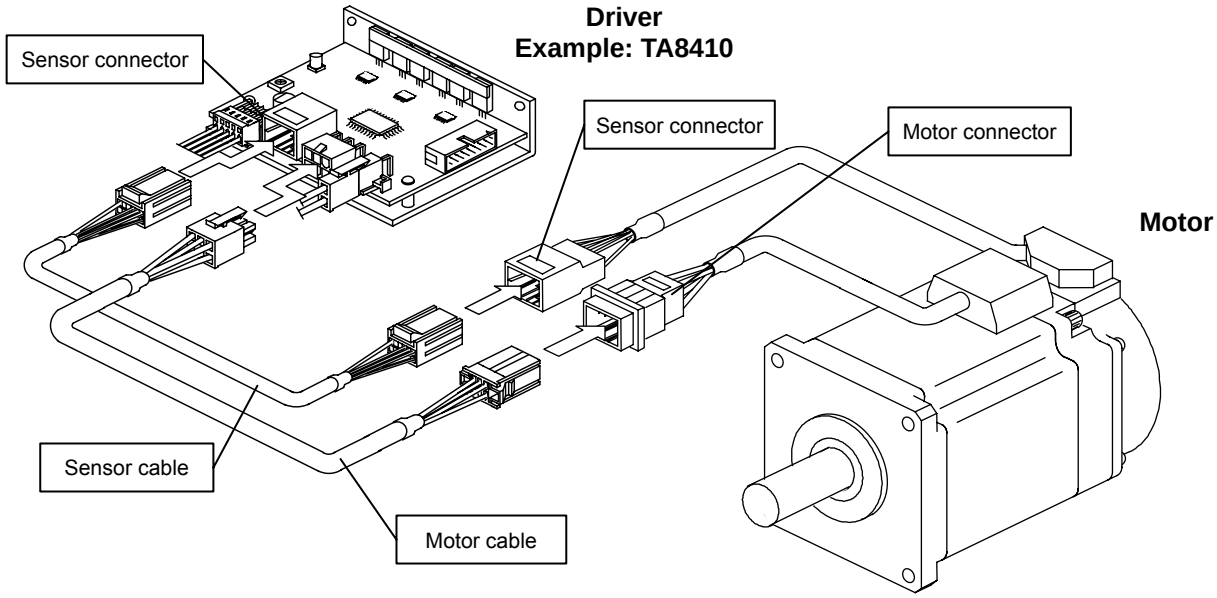
Caution!

Make sure the control power supply does not overlap. If the driver control power supply is supplied from a connector other than the SV-NET connector, take appropriate measures such as disconnecting the connector temporarily.

Driver-Motor Connection Example

To connect the driver to the motor, refer to the instruction manuals of the driver and motor to be used. This section describes an example connection.

1. Connect each motor connector of the motor to that of the driver using the motor cable.
2. Connect each sensor connector of the motor to that of the driver using the sensor cable.



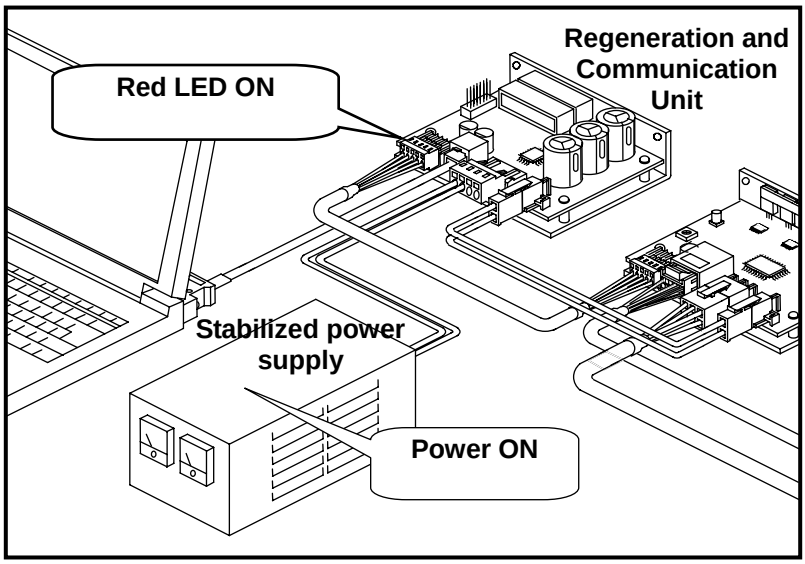
■ Cable specifications for motor connection

The connection method may vary according to the combination of driver and motor. This manual does not describe the cable specifications. Refer to the instruction manuals of the driver and motor for this.

4. Operation

When power is on

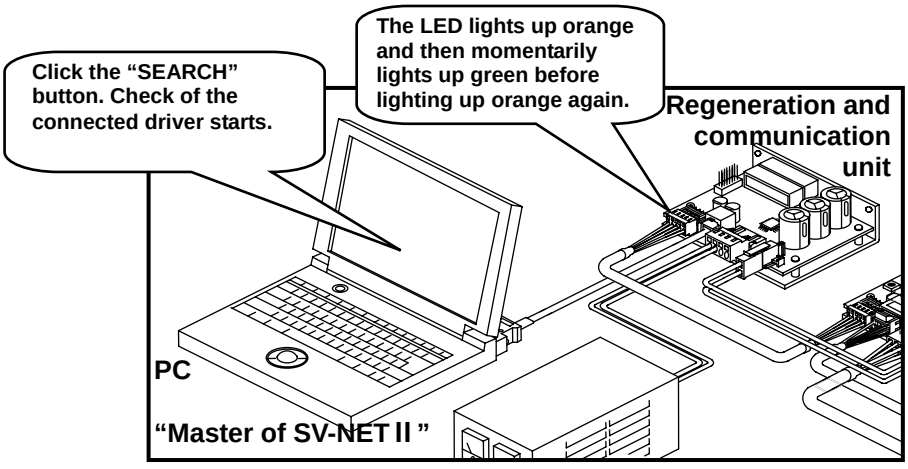
After the regeneration and communication unit is turned on, the LED lights up red.



Starting "Master of SV-NETⅡ" Communication

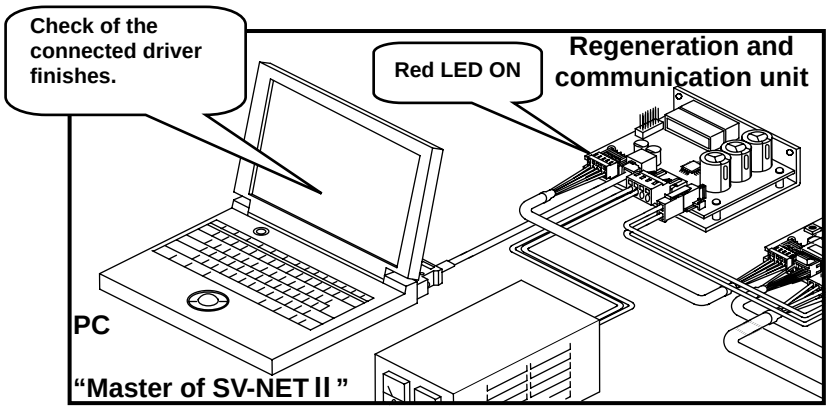
For a detailed explanation of how to operate the SV-NET communication software "Master of SV-NETⅡ," refer to its instruction manual. "Master of SV-NETⅡ" must be installed on the PC to be connected in advance.

1. After starting up "Master of SV-NETⅡ," click the "SEARCH" button located in the upper section of the main screen to check the driver connected. When the button is clicked, the LED of the regeneration and communication unit lights up orange once the PC starts the check, and momentarily lights up green when the driver responses.

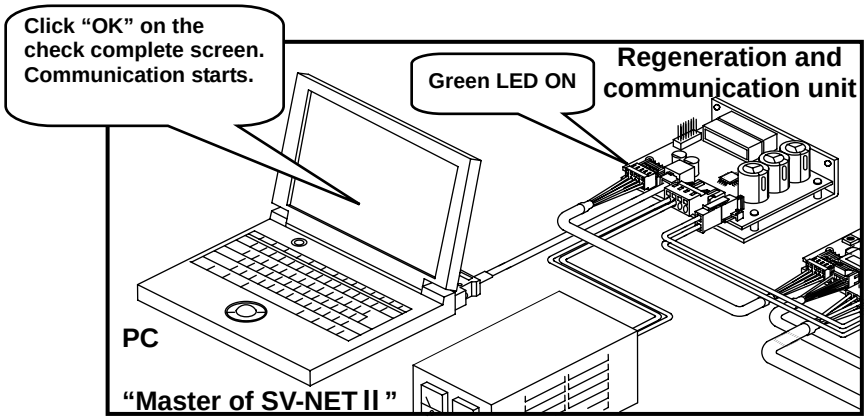


Starting "Master of SV-NET Ⅱ" Communication

2. After the check has been completed, communication is closed and the regeneration and communication unit LED lights up red.



3. The check complete screen is displayed on the PC. Clicking the "OK" button starts communication with the driver. The regeneration and communication unit LED then lights up green.



LED Indication

The LED indicates the communication status in three colors.

LED color	Meaning
Red ●	Communication closed
Orange ●	RS232 communicating
Green ●	SV-NET communicating

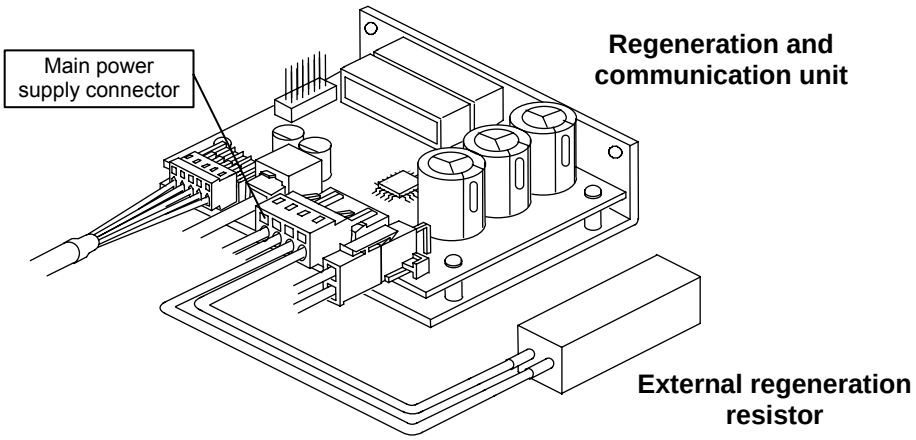
5. Option Function

Connecting an External Regeneration Resistor

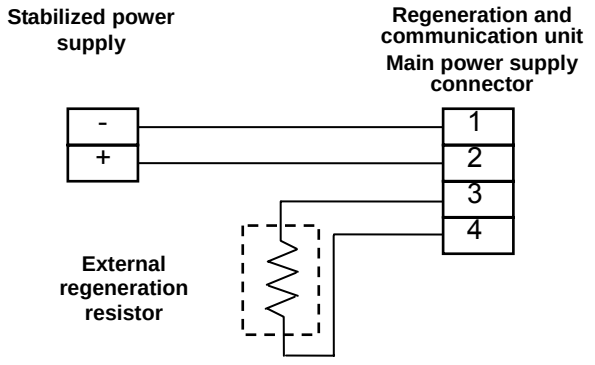
If the capacity of the regeneration resistor is insufficient, an external regeneration resistor can be connected.

■ External regeneration resistor values (recommended)

Model N code	External resistor value
N*1 (15W-6.8 Ω × 2)	47 Ω or more
N*2 (15W-13 Ω × 2)	100 Ω or more



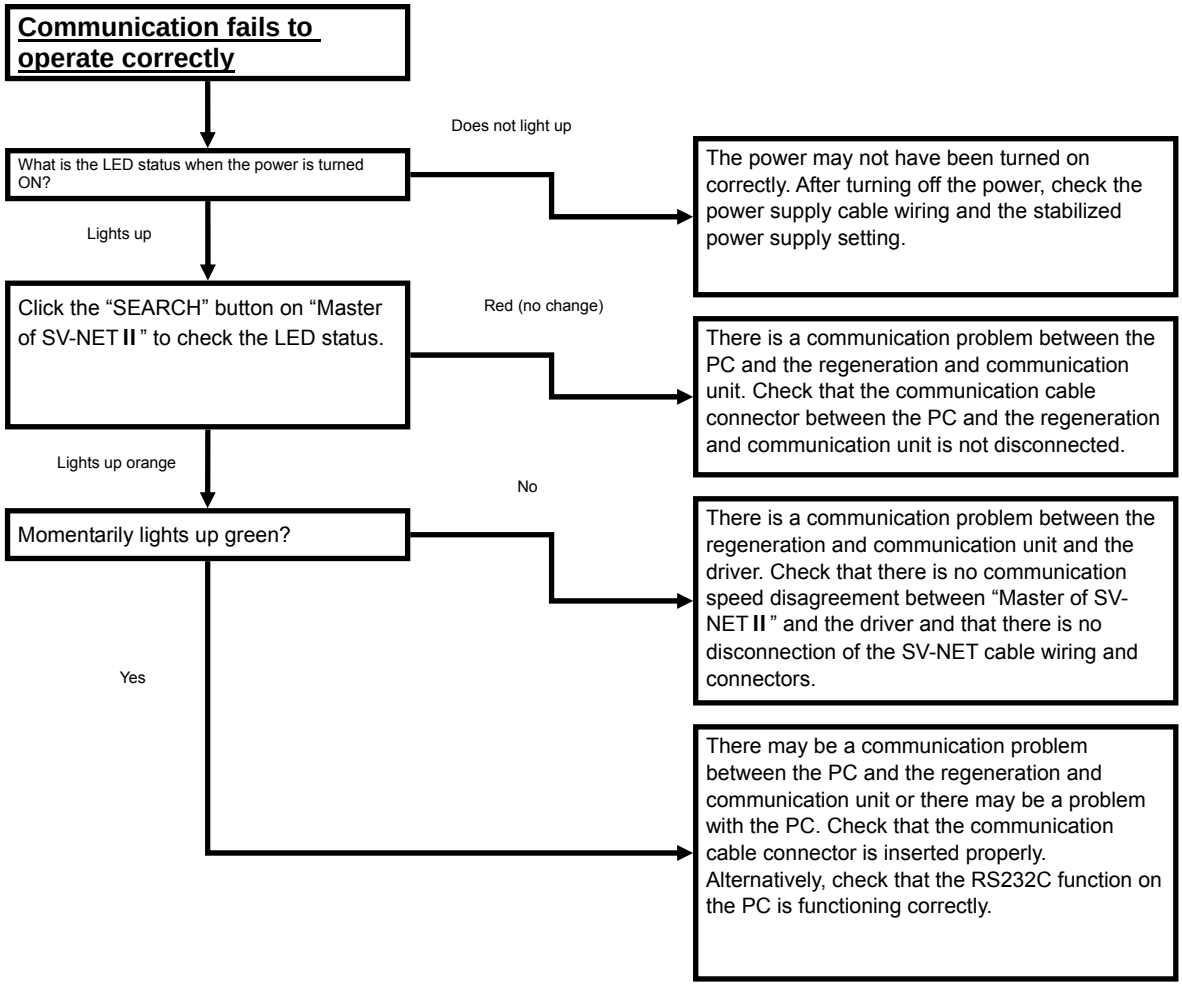
■ Connection diagram for an external regeneration resistor



6. Troubleshooting

What should I do if communication fails to operate correctly?

If communication fails to operate correctly, follow the following procedure to identify the problem.

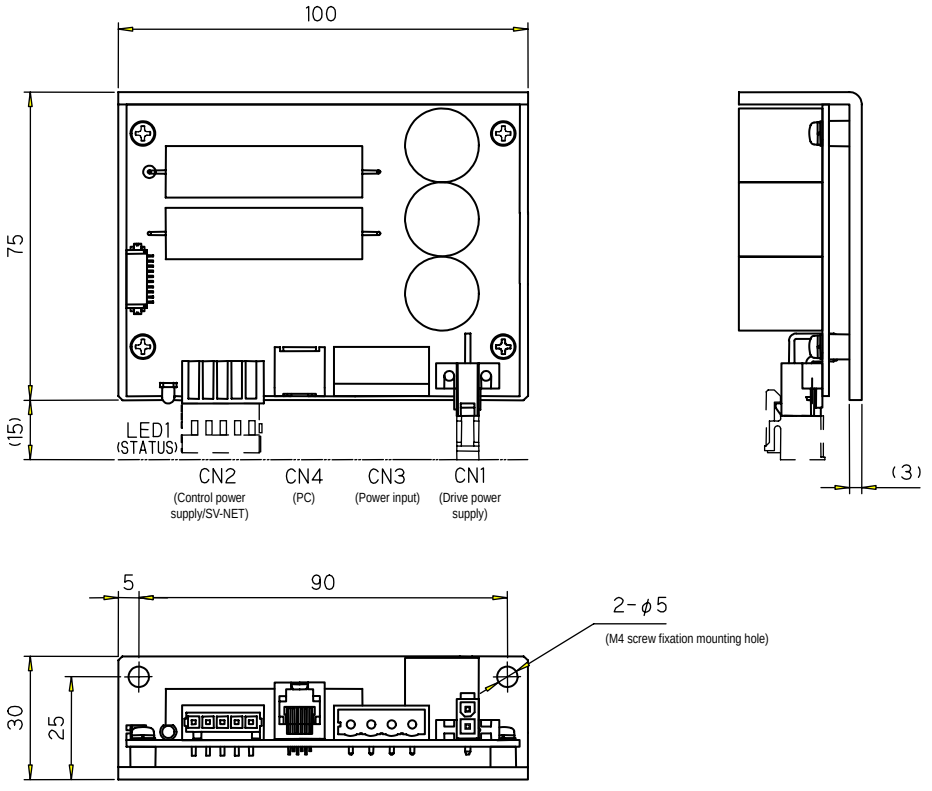


7. Specifications

General Specifications

Item	Regeneration and Communication Unit TA8413	
	24-V type, N1*/N2*	48-V type, N3*/N4*
Input power supply voltage	DC 24V ±10%	DC 48V ±10%
Drive power supply output voltage	DC 24 V, ±10% (max. 24 A)	DC 48 V, ±10% (max. 24 A)
Control power supply output voltage	DC 23 V, ±10% (max. 0.1 A)	DC 25.5 V, ±10% (max. 0.1 A)
Regeneration capability	30W	
Communication specifications	PC	RS232C
	Driver	Communication protocol: SV-NET Physical layer: CAN
Structure	Base-mount type (open frame)	
Operating temperature range	0°C to +40°C	
Operating humidity	90% or less (no condensation)	
Outer dimensions	30 × 100 × 75 (height × width × depth (mm), excluding connector and LED dimensions)	
Mass	Approximately 0.3 kg	

Outline



8. After-Sales Service

Repair and Inquiry

- For repair or inquiry, please contact the dealer from whom you purchased the product.
- We offer a service that enables you to upgrade your software version. Please consult us about this (chargeable).

Guarantee

■ Free Guarantee Period

The free guarantee period is valid for the shorter of the following: within one year of the product being installed at your site or your customer's site or within 18 months (from the manufacture date) of the product being delivered from our plant.

■ Failure Range

Failure diagnosis

We kindly request that, as a rule, you perform the first diagnose of the failure.

However, this diagnosis can be performed instead by us or our service network if you so request.

In such a case, following discussions with you, repair is free if the failure is attributed to us.

Failure repair

Repair, substitute replacement, and on-site visits for the occurrence of a failure is chargeable in cases 1 to 4 that follow, and free in other cases.

1. If the failure is due to improper storage or handling, negligence on the part of you or your customer, the nature of your software or hardware design, or any other such reason.
2. If the failure is attributed to modifications and changes you have made to our products without our approval.
3. If the failure is attributed to use of our products out of the operating range.
4. Other failures that you acknowledge as being out of our responsibility.

Exemption from Responsibility for Compensation for Equipment Loss and the like

Whether within the free guarantee period or not, our guarantee does not provide compensation for the following items attributable to the failure of our products: any loss of equipment you or your customers may suffer, any damage to a product other than our own as well as damage attributable to another's responsibility.

Period of Repair after Production Discontinuation

We repair discontinued products for seven years following the date on which their production was discontinued. For some products, substitutes may be recommended.

Delivery Condition

For standard products which do not include application setting and adjustment, delivery of the product to you is deemed as acceptance of the product, and we assume no responsibility for operations such as on-site adjustment and trial runs.

Appropriate Use of This Product

- This product is not designed or manufactured for use with equipment and systems used in situations where there is a risk to life.
- If you consider to apply this product in medical, aerospace, nuclear power, electric power, marine, passenger mobile use, and other special systems, please consult us at our sales office.
- This product is manufactured under strict quality control. However, if the application is such that failure of the product may result in serious accident or loss, safety devices must be installed on the equipment and systems on which our product is installed.

Revision History

Date of revision	Rev. No.	Reason for revision	Description of revision	Stamp
08/09/22	-	Newly created first version.		