No.PMPC039E-c

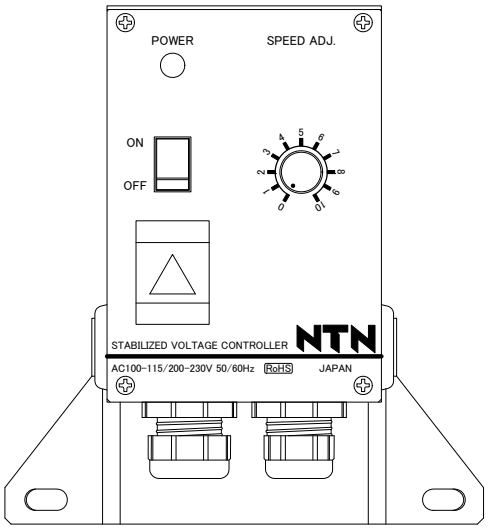
Read the Instruction Manual to the last before use and operate the machine correctly.

Instruction Manual

(With Warranty Card)

Stabilized Voltage Controller

K-EGA57 (Control capacity 5A)
K-EGA17 (Control capacity 0.3A)



Introduction

Thank you for your purchase of NTN stabilized voltage controller. In order to correctly and safely operate this controller, be sure to read through this instruction manual before using this device. This instruction manual with guarantee certificate shall be delivered to end users without fail. In addition, users shall keep this manual at the safe place where readily available whenever needed even after reading.

1. Before usage

In order for you to use this device correctly and safely and to make the most of its function, notes below and on the next page shall be observed.

- ☐ On receiving this device, please check if there is any failure due to the transportation. If you find any inconvenience such as a failure, do not hesitate to contact the nearest sales office.
- ☐ This controller is only for NTN electromagnetic parts feeder. Usage in other than this application or usage exceeding the specification range is prohibited. It may cause failures.
- ☐ The “parts feeder” described in this instruction manual is the generic names for the bowl feeder, the linear feeder and so on.

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2. Notes on Safety

As to the safety, users must have a great responsibility of their own. Be sure to begin any operation after reading through this operation manual. In addition, in order to use this controller with safe, be sure to obey the warning and caution labels of this device as well as to observe the following notes.

⚠ Danger	This description shows that not observing this remark and mishandling the device will cause the death or serious injury of human body with high probability.
⚠ Warning	This description shows that not observing this remark and mishandling the device will cause the death or serious injury of human body.
⚠ Caution	This description shows that not observing this remark and mishandling the device may cause an injury of human body or property damage.

⚠ Danger

	Please never drive with the panel opened (an emergency case is excluded). Moreover, please turn off the power supply when you open the panel. It gets an electric shock, short-circuited, and is likely to ignite.
	Please never do the wiring work without cutting off the primary side power supply or the main breaker. It gets an electric shock, short-circuited, and is likely to ignite.
	This controller is a controller only for the NTN parts feeder (electromagnetic type vibration part supply machine). It is not possible to use it for other usages such as a piezo-electric type parts feeders and the single phase motors. It gets short-circuited and is likely to ignite.

⚠ Warning

	Please ground the earth cables of the controller and the main body without fail. There is a fear of an electric shock if you do not ground it.
	Please never use it in the place with a gas or a liquid that explodes and ignites. It causes a fire.
	Please a person other than the repair engineer never performs disassembling, repairing nor remodeling this device. It may ignite, do abnormal motion to make him/her injured.

⚠ Warning	
	It must not be used in a place where it exposes to water, oil or chemicals, or outdoors, or in a place of high temperature and humidity. There is a fear of an electric shock, a fire or a failure.
	Please do not scratch, pull or forcibly bend the wiring. Moreover, when a heavy thing is put on the wiring, or it is pinched, the wiring will be damaged. It causes a fire or an electric shock.
	Please do not touch controller's output terminal during energizing the controller while even stopping. There is a fear of an electric shock because the alternating current of maximum 200V is applied to the output terminal.
	Please do not connect AC power to the output terminal (1 and 2). It causes a fire or the breakdown.
	Foreign objects such as paper, waste wood or oil must not be allowed to enter the controller, and the controller must not ruin its heat radiation by covering it with such as the cloth. There is a fear of the burn or a fire, etc.
	Please do not operate the switch by a wet hand. There is a fear of an electric shock.
	Please do not use it with other than the specified voltage. It causes a fire or the breakdown.
	Please turn off the power supply or the main breaker on the primary side when you replace fuses. There is a fear of an electric shock.
⚠ Caution	
	The sheet metal of the controller BOX might become high temperature (50-70℃). Please note that there is a fear of the burn. Moreover, please install a space for heat radiation in the surroundings. (Refer to P.7)
	Please do not do "ON" and "OFF" of the power supply frequently. The controller will break down. (Please refer to the paragraph 7.-(4) the wiring of external control input in P.14)

Caution	
	Please do not install it in the place where the vibration or the impact is acting. The controller breaks down.
	Please refer to the note of caution on the margin below when doing the dielectric breakdown test and megger test (measurement of the insulation resistance by the meggohmmeter). The controller breaks down when making a mistake.
	In the case that external control terminals (S1, S2 and S3) are used, please use the dry relay contact. They are not insulated from alternate current. Accordingly, if transistors are used, the connected control unit or controller is damaged and there is a fear of electric shock.
	There is a distinction between the ground phase and non-ground phase in the power supply. Please confirm the earth phase side of the power supply, and connect controller's specified terminal to the earth phase side. (Refer to 12). There is a possibility of causing a fire when the wiring is grounded.
	Please install the leak breaker or the leak detector on the primary side of power supply of the controller for the ground fault protection. Especially, please install it surely when it is not possible to connect it to the ground phase. There is a possibility of causing a fire when the wiring is grounded.
	Surely connect the earth clip of the welding machine to the bowl when welding to the bowl. An incorrect connection of the earth for the welding may burn the earth cable that connects the main body and the controller, and fears such as electric shock, leaks, and the burn of the controller exist.
	Please don't conduct the welding work without turning off the power supply or the main breaker on the primary side of the controller. There is a possibility of causing damage of the controller.
	Please select and use an appropriate cable according to the voltage used, the current, and the environment. There is a fear of a leak or a fire when a wrong cable is used.
	Please set the DIP switch for setting of power source voltage, frequency and driving system before driving without fail. If setting is wrong, there is a fear that magnet burns out.
	Be sure not to install or drive a damaged controller or a controller which is lack in parts. There is a fear of an injury.
	The noise is generated from the controller or wiring and equipments connected to the controller. Please take care that neither a peripheral equipment nor the sensor will malfunction. There is a fear of an accident.

∗Note: Please execute the dielectric breakdown test with AC1500V or less between AC line and the earth. The leakage of current shall be 5mA or less.

Terms appearing frequently in this Instruction Manual

1. "Parts feeder" means generic names of such as bowl feeders and linear feeders, and for NTN products only.
2. The one only written as main body indicates “Vibration main body of parts feeder”.

3. Function and Features

(1) Wide input (Applicable to wide range of power source voltage)

Input voltage range is AC100～115/200～230V±10% (Changeover type with DIPswitch). Output voltage is output, depending on the power source voltage and DIP switch.

(2) Constant voltage function

It curbs the influence of power source voltage fluctuation and keeps the output voltage constant. It is especially useful when the controller is used at the site where the power source voltage fluctuation is intensive, such as a site where the electric power condition is bad and a 24 hours continuous operation.

(3) Equipped with external control input terminal

External control input terminal is equipped so as to control ON/OFF of the controller smoothly. Remote control of drive and stop of the controller is possible using a small relay contact. (Refer to P.14)

(4) Equipped with soft start function

Soft start function is equipped so that vibration at the time of starting up changes smoothly for the case ON/OFF control was made using the external control input terminal. Depending on application, change of 8 stages from 0 to one second is possible. (Refer to P.17)

(5) Equipped with level switch input terminal (Also applicable to the separately placed hopper)

Level switch input terminal for the separately placed hopper is equipped as a standard. Therefore, it can be also used as a controller for the separately placed hopper.

(6) Lineup of excusive types for small capacity load

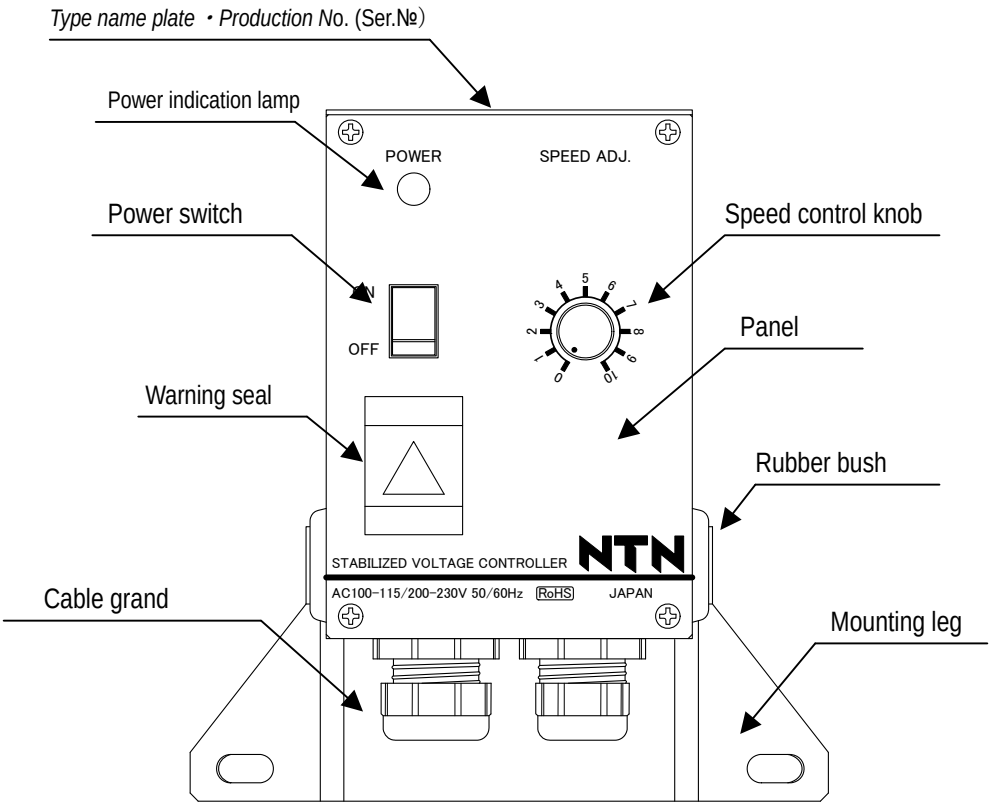
When the vibration main body with small consumption current is controlled, there is such a case that it may not help but vibrate due to leak current of the controller even if the stop signal is entered. Small capacity load control type, K-EGA17 is also available so as to control such a vibration main body. It is especially useful for the control of linear feeder of S05 and S08 types. (Refer to P.22)

(7) Mountable to plain surface

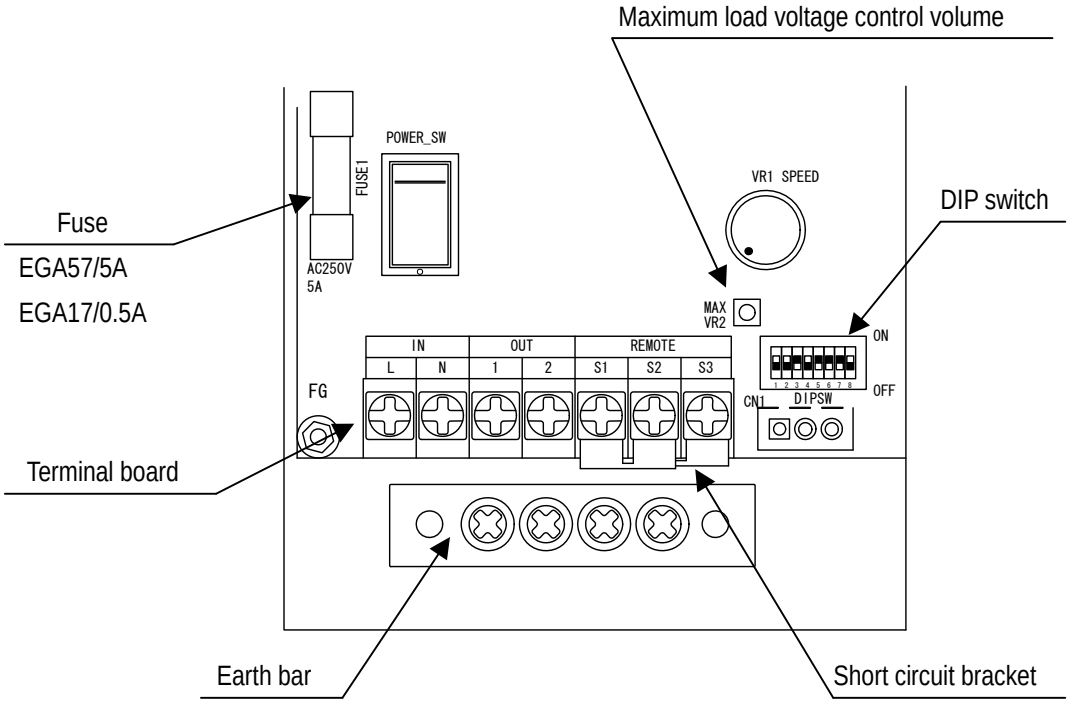
As a separate option part, plain surface mounting leg (K-PZ0465) is available. This is most suitable for cohesion mounting to mounting surface or mounting to the inside of your control panel. Also, it is possible to fit to the mounting leg designed by customers. (Refer to P.8)

4. Appearance and Names of Portions

(1) Appearance diagram（Please refer to P.23 for dimensions）



(2) Terminal board (view with panel removed)



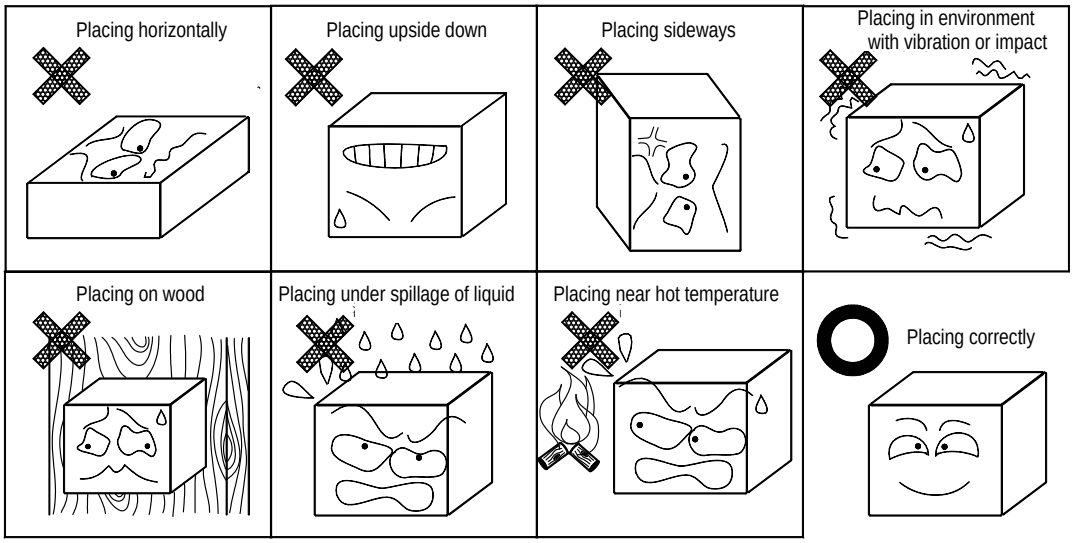
5. Installation

(1) Installation place

① Please install it on a firm material such as metals (nonflammable material) having no vibration.

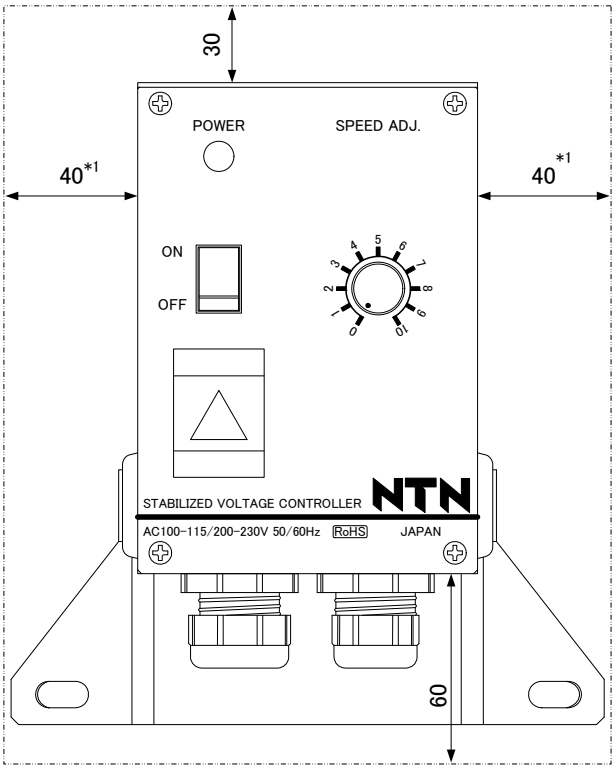
② Please have a space in surroundings without fail so as not to ruin heat radiation and install it vertically.

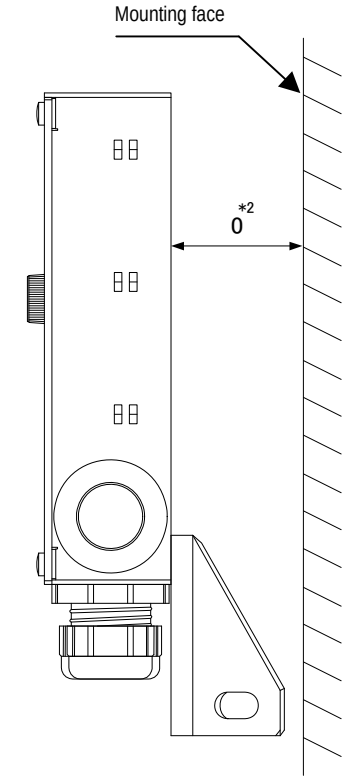
③ Oils and fats and chemicals, etc. may hurt the resin, painting, and the cable of BOX. These liquid and mist must not splash directly on the controller.



(2) Surrounding space

It is necessary to leave a space shown in the figure below in the surroundings of the controller for heat radiation (Unit: mm)





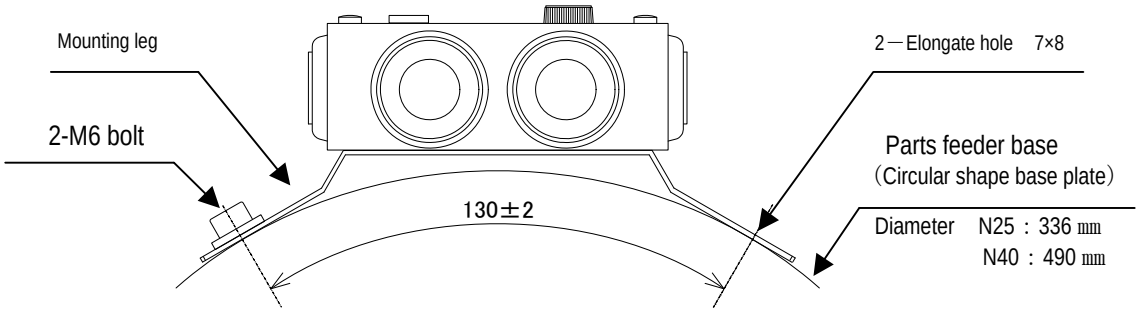
＊1 When the mounting leg is removed and the wiring is made without using rubber bushes of the side face, it can be shorten to 10mm.

＊2 If the mounting leg is removed, cohesion mounting of the back surface is possible.

(3) Mounting method

① In case of mounting on circular shape base plate

Figure below shows condition that controller is mounted on circular shape base plate and it was a view from the bottom.

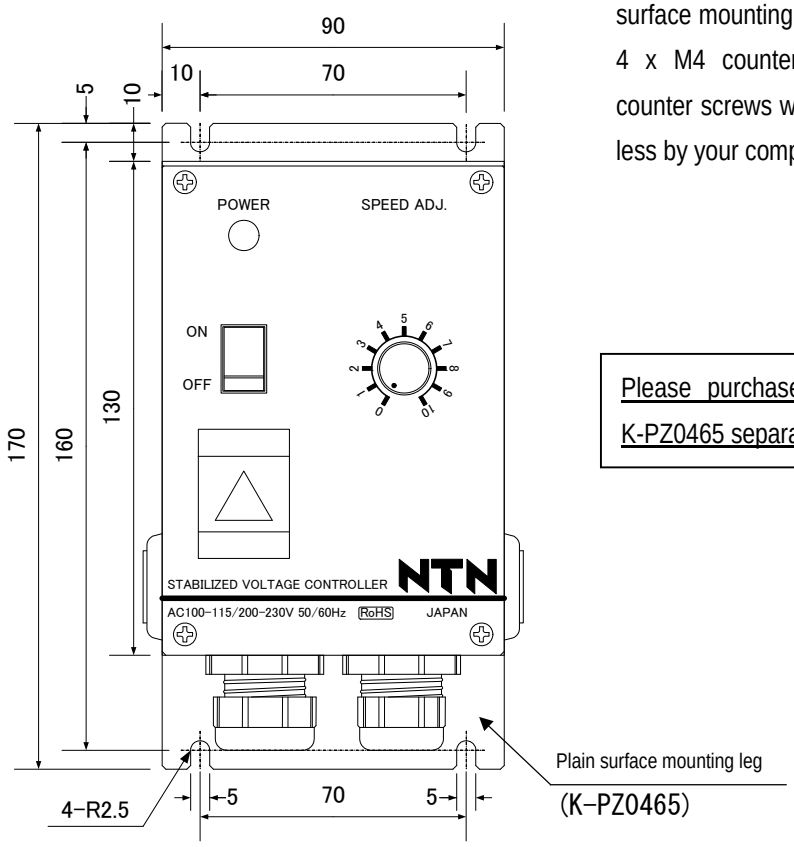


If the mounting leg is stretched to plain, plain surface mounting is possible. In this case, the mounting pitch is 130mm.

② In case of using the plain surface mounting leg, NTN option part

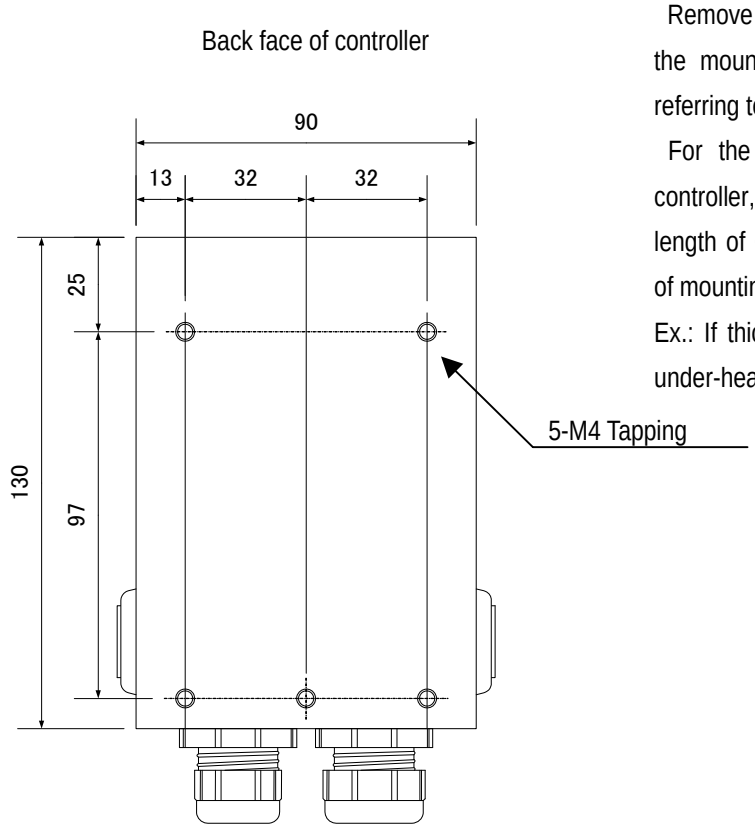
Plain surface (Vertical surface) mounting leg, Option part K-PZ0465

Remove the mounting leg of controller and fix plain surface mounting leg (K-PZ0465) to the controller with 4 x M4 countersunk screws. Please prepare M4 counter screws with under-head dimension of 8mm or less by your company.



Please purchase the plain surface mounting leg K-PZ0465 separately.

③ In case mounting plate is made by your company



Remove the mounting leg of controller and make the mounting plate matching to your specification referring to the left figure.

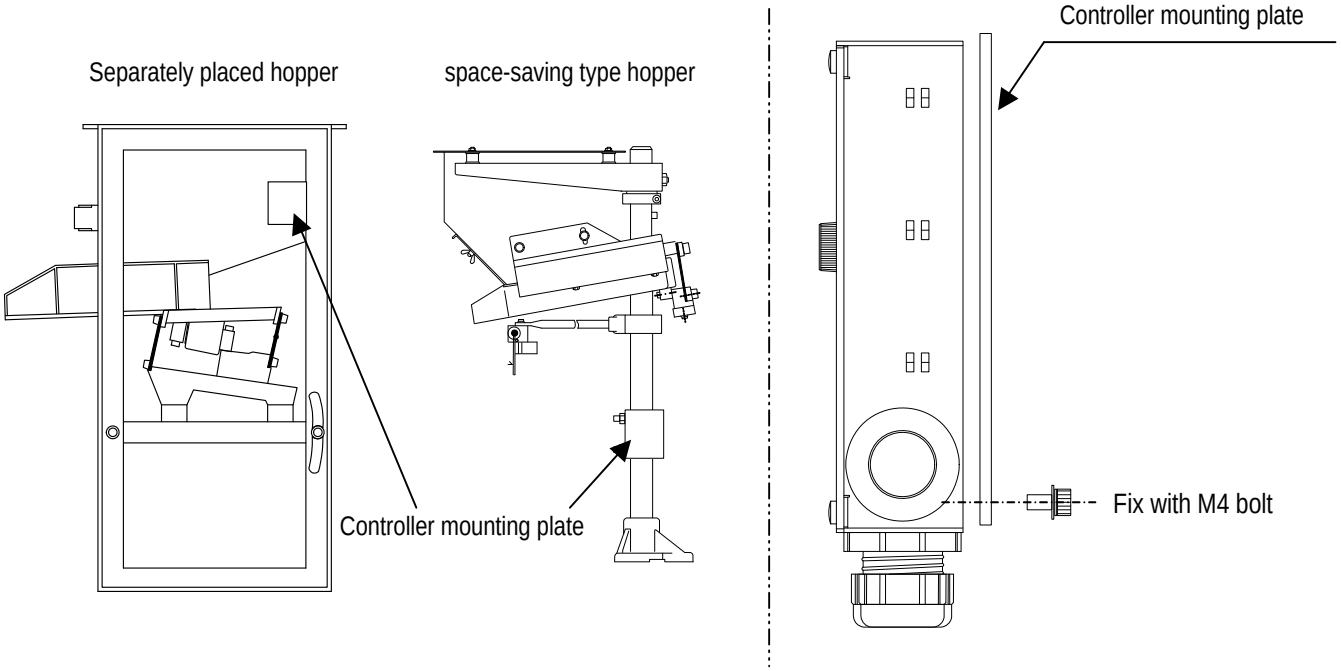
For the bolts to fix the mounting plate to the controller, please prepare M4 size bolts with thread length of 6mm or less excluding the plate thickness of mounting plate.

Ex.: If thickness of the mounting plate is 2mm, the under-head length of bolt is 8mm or less.

④ In case of fixing to the controller mounting plate of separately placed hopper or space-saving type hopper.

Remove the mounting leg of controller and fix it to the controller mounting plate. For fixing bolts, either use the same bolts used to fix the mounting leg or prepare by your company.

When you prepare bolts, please use M4 bolts with the under-head length of 8mm or less.



6. For the first time use

When you use the controller first time after the purchase, please make connections of input/output and set the DIP switch (DIP SW) according to the following procedure. In case that you purchased the pre-set product, works of such as wiring connection and setting are not necessary. However please check connections and settings without fail before driving.

Flow for driving (Refer to relative pages (above arrow) of each time for the details)

1. Connection of input and output
Connect the parts feeder used and input-output signal cable etc.

Refer to P.11 onward

＜Basic connection＞
- Power source connection→P.12
- Load cable (Parts feeder)→P.13

＜Connection based on using conditions＞
- External control input→P.14～P.15

2. Setting of DIP SW
Set DIP SW to match to the using conditions.

Refer to P.16 onward

・Power source voltage setting	SW1
・Frequency setting	SW2, SW3
・Driving system setting	SW4, SW5
・Soft start setting	SW6~SW8

3. Operation
Input driving signal and start driving.

Refer to P.18

In case that driving signal was input by your company, start operation.
When operating signal is not available, short circuit the terminals of S1-S2 and S2-S3.

4. Maximum load voltage adjustment
Adjust maximum load voltage to match to power source, frequency and specifications of parts feeder main body.

Refer to P.19~20

Maximum load voltage is automatically set to just about maximum load voltage of every main body. But, since maximum load voltages of some main bodies may be different from the standard, please check before use without fail and adjust as needed.

5. Leaf spring adjustment
Adjust the leaf springs so as to make amplitude of parts feeder appropriate.

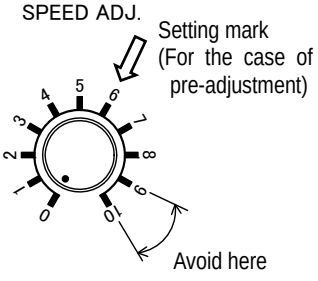
Refer to this manual

Please adjust leaf springs based on mounted bowl and shut. Refer to the manual of parts feeder main body for the detail.

6. Speed (Voltage) adjustment
Adjust voltage with speed adjustment knob so as to have appropriate amplitude output.

Refer to P.18

Amplitude (Voltage) increases by turning the speed adjustment knob clockwise.



7. Connection of Input / Output

Danger

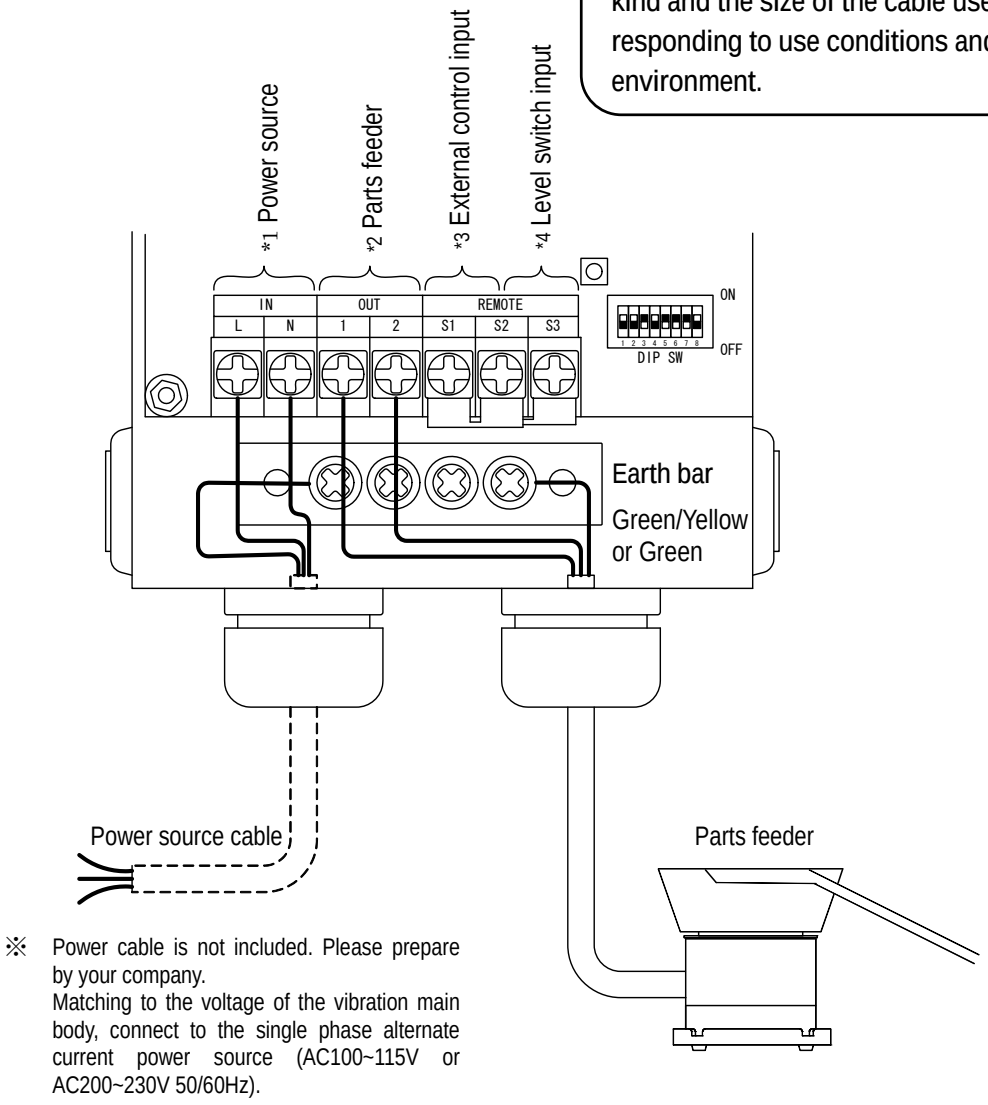
Do the wiring work after cutting off the main breaker without fail. It is likely to get an electric shock.

Caution

Please select an appropriate type to the kind and the size of the cable used and responding to use conditions and the environment.

External connection diagram

(Details of each wiring are described in the page shown in the notes written below, therefore please refer to them.)



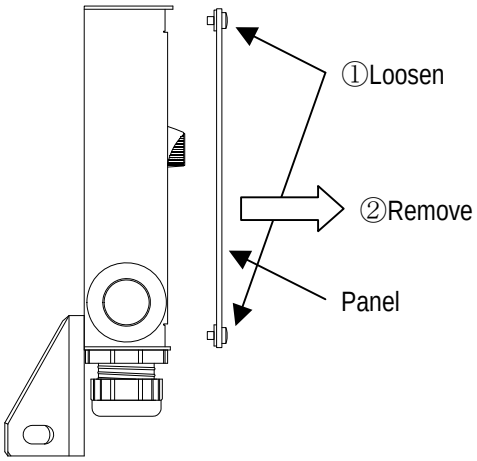
※ Power cable is not included. Please prepare by your company.
Matching to the voltage of the vibration main body, connect to the single phase alternate current power source (AC100~115V or AC200~230V 50/60Hz).

Caution

Please refer to the descriptions in caution for safety in P.2 to 4 and explanations for each item below for the wiring method and cautions when wiring.

∗1 Wiring of power supply P.12 Refer to paragraph “Connection to power supply”
∗2 Wiring of load P.13 Refer to paragraph “Connection to load line”
∗3 Wiring of external control signal P.14 Refer to paragraph “Wiring of external control input”
∗4 Wiring of level switch P.15 Refer to paragraph “Wiring of level switch”
∗5 Screw for controller terminal board is M3. Use the M3 crimp-type terminal for connection.

(1) Removing the panel



⚠ Danger

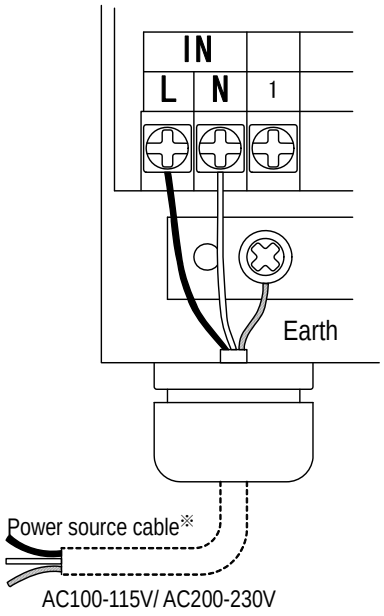
Do the wiring work after turning off the main breaker without fail.

①Loosen screws of M3-4 fixing the panel. As they are the dropout preventive type, they are removed by turning 3~4 times. If turned too much, they might drop off.

②When the fixing screws are loosen, the panel can be removed.

(2) Connection to power supply

For details of the terminal board layout, please refer to P.6.



⚠ Warning

Connect the earth cable without fail. There is a fear of an electric shock if the earth is not connected.

Connect the power source cable to the single phase power source. At that time, for protection against earth fault, connect the N terminal to the earth phase side without fail. In case of connecting to the AC100V power source, output is AC100V also.

※Power source cable is not included. Please prepare it by your company. Select the cable size matching to the rated current of the breaker connected and the wiring length.

Name of terminal board	Remarks	
L	Non-earth side	Single phase power
N	Earth side	
Earth bar	Earth	

Note 1. The controller for the parts feeder must be connected to the power supply of the commercial power or the sine wave voltage output. Please do not connect it to the output side of the inverter that contains the harmonic component such as sine wave PWM inverters. The controller breaks down.

Note 2. Please set up a leak detector or a leak breaker on the controller primary side for the protection of the earth faulty-accident. Refer to the paragraph of the specification in P.43 for the current rating.

Note 3. Power supply cable length shall be 10m or less. Moreover, please use the cable of the size of 2.5mm^2 or more when extending it to 3m or more (The protection coordination with the primary side breaker is noted). Additionally, the connection to the controller terminal board must be done by using the round type crimping terminal (The terminal screw: M3).

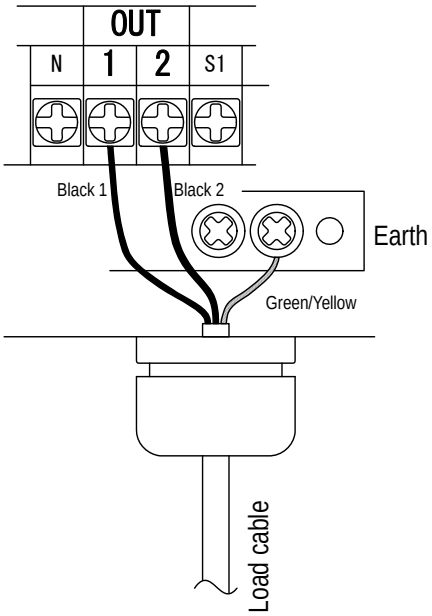
Note 4. In case that transformer is used, please also refer to “Notes for transformer usage of P.14”.

Note 5. Correct earth shall be checked by a protection continuity tester after the earth construction work ends. When the earth is imperfect, it is likely to get an electric shock.

Note 6.There is a possibility that the noise is added in the power supply line. Please take measures such as separation of the power supply from equipments which dislike noise or insertion of noise filter. Moreover, please do not put the main circuit (power supply or load line) and the signal line in the same duct (protection tube).

Note 7 It is possible to connect it to the three phase power supply. In this case, please use two phases (for example, R and S phases) out of three phases (R, S and T) for the power supply. In addition, please wire after confirming the phase grounded by a voltage detector etc. so that the terminal on N side is the earth phase. Please wire through a leak breaker when the earth phase is unknown.

(3) Connection of load line



Please connect the load line (load cable of the parts feeder attachment) to the terminal board through controller's cable ground. As the voltage of max AC200V applies to this terminal, be careful of the wiring enough. Please refer to the following note 1 when extending the line.

Name of terminal board	Color of wiring
1	Black 1 or Red
2	Black 2 or White
Earth bar	Green/Yellow, Green or Black

*1 Please do not connect this to other than the parts feeder. It breaks down.

*2 Please refer to P.15 when connecting the hopper separately placed as wiring of level switch is necessary.

*3 The connection to the controller terminal board must be done by using the round type crimping terminal (The terminal screw: M3).

Note 1 Extension of cable length

Please use the size of 1.0mm^2 or more when you change the cable. Moreover, when extending it to 3m or more, please connect it to the main body cable by extending it to the vicinity of the main body by using the cable of the size of 2.5mm^2 or more, and using the relay BOX. Extension length shall be 10m or less.

Note 2 There is a possibility that the noise is added in the power supply line. Please take measures such as separation of the power supply from equipment which dislike noise or insertion of noise filter. Moreover, please do not put the load line and the signal line in the same duct (protection tube).

Note 3 Correct earth shall be checked by protection continuity test machine after the earth construction work ends. When the earth is imperfect, it is likely to get an electric shock.

∗ Notes for transformer usage

When parts feeder etc. is operated via a transformer for pressure rising or pressure lowering due to your company's reason, please take care of the capacity of the transformer. Please prepare the transformer with capacity of same or more in case of full wave and of 2 times or more in case of half wave comparing with the current value shown on the nameplate of parts feeder etc. to be used. If the capacity is insufficient, the vibration may not stabilize.

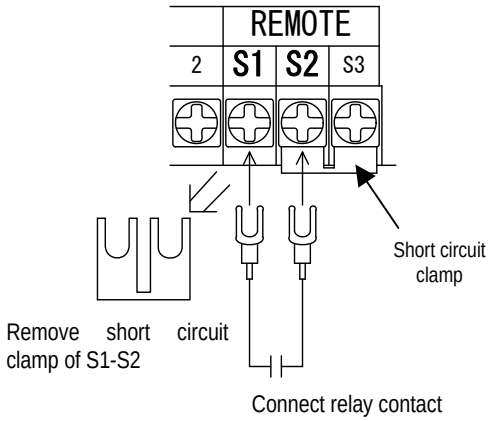
Examples: (1) N25 AC200v Full wave → Rated current 1.8A

Transformer capacity≧200V x 1.8A = 360VA

(2) N40 AC200V Half wave → Rated current 3.5A

Transformer capacity≧200V x 3.5A x 2 = 1,400VA

(4) Wiring of external control input



Between S1-S2	Parts feeder
Short circuit	Drive
Open	Stop

⚠ Caution

S1~S3 terminals are not insulated from the power source voltage. Controller is damaged if voltage is applied from the outside. Use the dry contact relay without fail.

⚠ Caution

Parts feeder's ON/OFF control must use the external control input terminal. ON/OFF control by the power supply is impossible.

◆In case of controlling with external signal

①Remove the short circuit clamp between S1-S2 terminals.

②Connect the relay contact between S1-S2 terminals.

Please prepare cables etc. used for control at your company. As it is not insulated with the AC power source, please take care for selection of cables.

- Between S1-S2: Parts feeder is operated with short circuit.
- Between S1-S2: Parts feeder is stopped with open.

In case of using the separately placed hopper for control, refer to the next page.

Note 1 About 11mA current flows between S1-S2 terminals. As it is minute current, please pay enough attention for noise.

Note 2 External control input cable length must be within 10m, and if possible, please apply twist wiring.

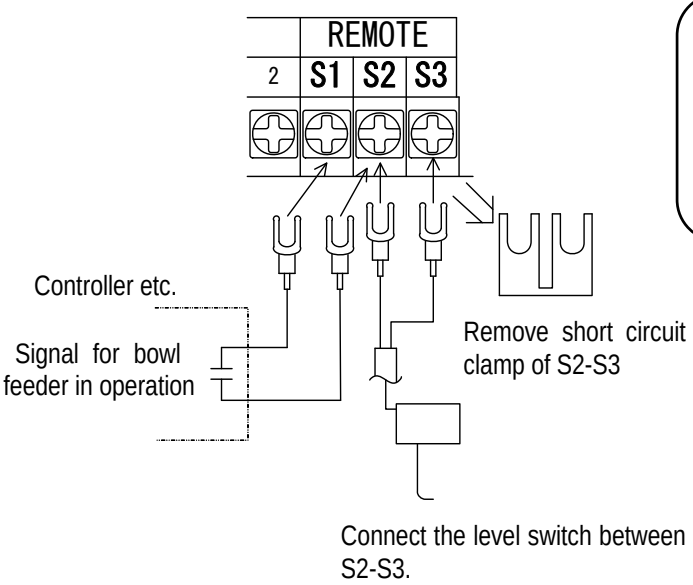
In case of not using the external control

In case of not using the external control, please short circuit between S1-S2 terminals with short circuit clamp etc.

In case of not using S2-S3 terminals (Level switch contact at time of using hopper), please short circuit them with short circuit clamp etc.

When between S1-S2 and between S2-S3 are short circuited, parts feeder is continuously operated.

(5) Wiring of level switch



⚠ Caution

S1~S3 terminals are not insulated from the power source voltage. Controller is damaged if voltage is applied from the outside. Use the dry contact relay without fail.

①Connect the separately placed hopper to 1, 2 and earth bar terminals.

②Connect the level switch of separately placed hopper to terminal between S2-S3. .

③Input the in-drive signal (Y1C, Y1A etc.)for bowl feeder to terminal between S1-S2.

Between S1-S2	Between S2-S3	Separately placed hopper
Short circuit	Short circuit	Operation
Short circuit	Open	Stop
Open	—	Stop

By the above connection, the bowl feeder of separately placed hopper is in operation and only at time when the level switch is ON (Terminal between S2-S3 is short circuited.), it is operated. Current of about 11mA flows in the level switch.

＊1 Please refer to the operation manual of the separately placed hopper also.

＊2 Please refer to the previous page for S1-S2 terminal (External control).

In case of not connecting the level switch

In case of not connecting the level switch, please keep the terminal between S2-S3 short circuited. Connect external control signal to terminal between S1-S2 or keep it short circuited.

(6) Setting of DIP switch

Set the DIP switch under the condition that the power source is OFF without fail.

(Refer to P.6 for the location of the switch.)

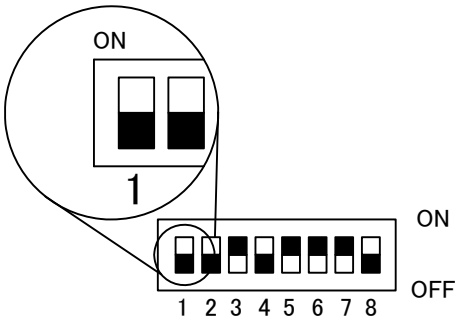
⚠ Caution

Confirm the setting of DIP switch before driving without fail. If the setting is wrong, there is a fear that such as burnout of magnet is caused.

＊Changeover the DIP switch with a flathead screwdriver with fine top etc. (About 1mm width)

In case of pre-adjustment such as purchase of a complete unit, setting of the following switches is not necessary. But please confirm.

①Changeover of power source voltage



Setting with Dip switch SW1

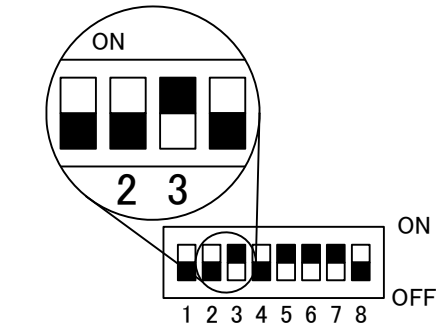
Change over the switch matching to power source voltage (Rated voltage of parts feeder) to be connected.

It is set to the 200V side (SW1:OFF) at time of shipping from NTN.

In case of using at power source voltage of AC100V, changeover to the 100V side (SW1:ON)

Power source voltage	SW1
100V	ON
200V	OFF

②Frequency changeover



Setting with DiIP switch SW2 and SW3

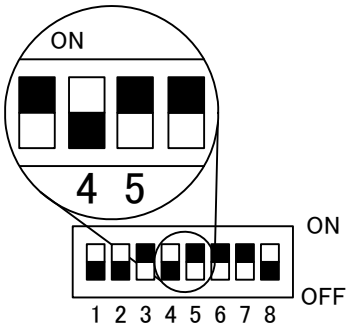
Change over the switch matching to the power source frequency.

It is set to the 60Hz side (SW2:OFF and SW3:ON) at time of shipping from NTN.

When changed over to this switch, please confirm if the maximum voltage of load is an appropriate value without fail. (Refer to P.19～20)

Frequency	SW2	SW3
50Hz	ON	OFF
60Hz	OFF	ON

③Full wave/half wave (Driving system) changeover



Setting with DIP switch SW4 and SW3

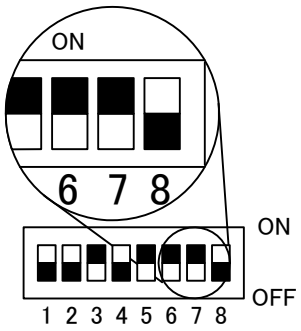
Change over the switch according to the driving system of parts feeder (Full wave/half wave) to be used.

It is set to full wave (SW4: OFF and SW5: ON) at time of shipping from NTN.

When changed over to this switch, please confirm if the maximum voltage of load is an appropriate value without fail. (Refer to P.19~20)

Driving system	SW4	SW５
Half wave	ON	OFF
Full wave	OFF	ON

④Changeover of soft start time



Setting with DIP switch Sw6~SW8

Rising time of output voltage at time of parts feeder start-up is adjustable. Setting at 8 stages with combination of ON/OFF of SW6~SW8 is possible.

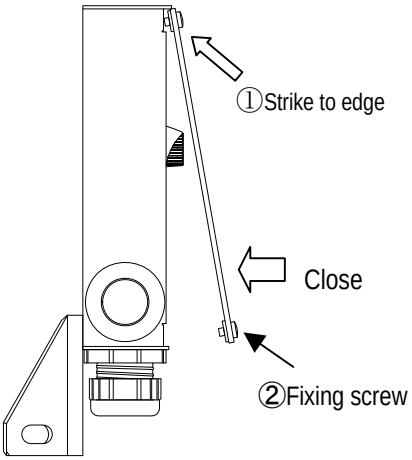
It is set to 0.3 second (SW6:N, SW7:N, SW8:OFF) at time of shipping from NTN.

Refer to the table below for the target of time.

switch / time	SW6	SW7	SW8
0.0 second	OFF	OFF	OFF
0.1 second	ON	OFF	OFF
0.2 second	OFF	ON	OFF
0.3 second	ON	ON	OFF
0.5 second	OFF	OFF	ON
0.6 second	ON	OFF	ON
0.7 second	OFF	ON	ON
1.0 second	ON	ON	ON

＊Above time is for reference value. Since the actual time including for vibration main body varies, please confirm and adjust with the actual machine.

(7) Close the panel



⚠ Caution

For electric driver, pay attention to the tightening torque. If setting is wrong, the panel may fracture or deform.

Please check if connection of wiring is not wrong.

Contents of checking

A) Isn't connected point wrong?
B) Isn't setting of DIP switch wrong?
C) Isn't there possibility of short circuit or earth fault?
D) Is the earth connected for certain? Was the protective conduction test implemented?

① Close the panel under the condition that it is struck to the upper surface of controller.

② Fix the panel by tightening attached screw.

The panel is made of plastic and it may fracture by over tighteneing. Avoid the use of electric screwdriver or use it with torque of 0.7N・m or less. Furthermore, please take care for the handling avoiding shock, drop out, collision etc.

Now the wiring work is completed.

8. Operation and Adjustment

(1) Confirmation of specifications and preparation of operation

Before switching the power source on, please confirm once again if type, specifications and power source voltage are not wrong and the setting is made correctly.

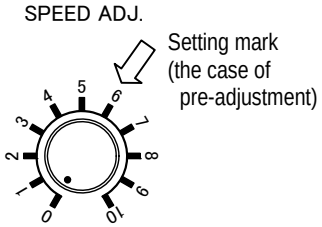
①Type and others are indicated on the upper face of controller.

②Keep the speed control knob to be “0” (Full turn in a counter clockwise direction).

In case of pre-adjustment such as purchase of complete unit, adjustments of above ② and subsequent paragraph (3) are not necessary.

⚠ Caution

Check the setting of switch before operation without fail. If the setting is wrong, the magnet burns out.



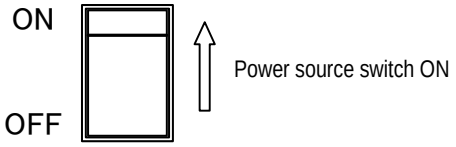
(2) Power source ON

①Make the power source switch “ON” and check the POWER lamp lights up.

When the external control input terminal is short circuited, the operation starts.

⚠ Caution

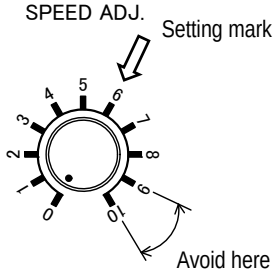
Don’t make the power source switch and the power source ON/OFF frequently. Controller may break down.



(3) Speed (Voltage) adjustment

①Turning the speed adjustment knob slowly in a clockwise direction, match to the position where necessary amplitude is ensured.

In case correct position is indicated, follow to the instruction. It is normally used under the range of scale 4~7 (6~7 for full wave system, 4~5 for half wave system).



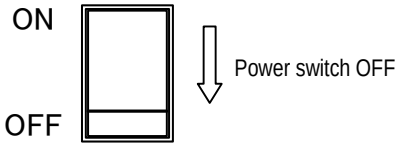
＊1	Do not use at scale of 9 or more. If used, voltage stability gets worse.
＊2	In case that controller was purchased as a single item, or certain specifications (such as 100/200V) are changed over in mid-flow, or the movement of controller is not good, please check the output voltage of controller. Refer to “9. Measuring method of load voltage” of P.19~20 for the measuring method.

(4) Stop

①Cut off operating signal from the outside (Set to the stop side).

(5) Power source OFF

①After confirming that opertion is stopped, switch off the power source.

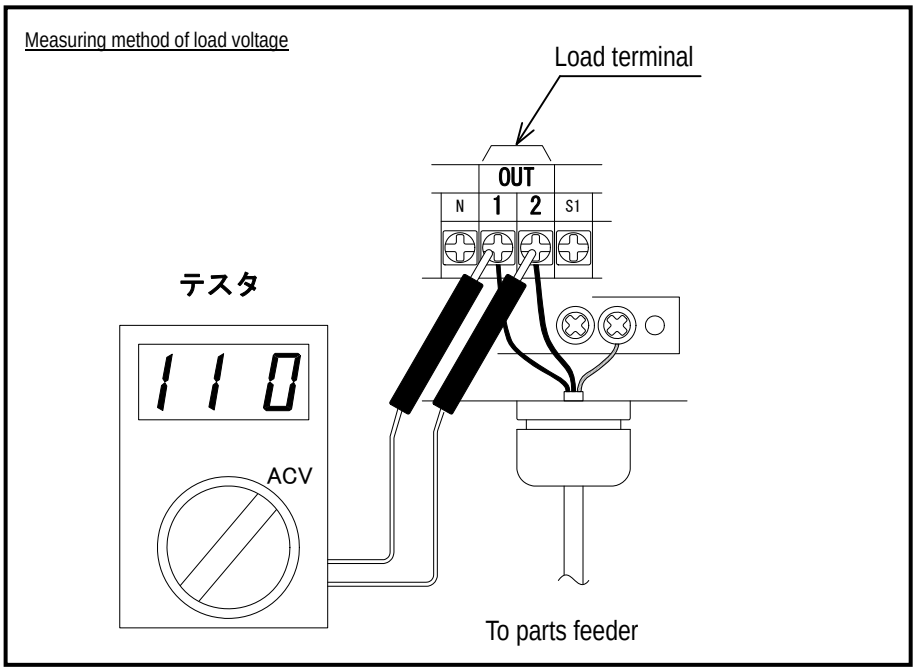


9. Measuring method of load voltage

(1) Measuring of load voltage

When measuring the load voltage, measure between terminal 1 and terminal 2 of OUT under the condition that load is connected without fail. (Unless load is connected, power source voltage is displayed.)

- In case of the analog type tester, measure twice after reversing tester bars of red and black, and make the average as a measurement value.
- Measurement range becomes alternate current voltage range also in the case of half wave.
- Use the average value type tester for measurement without fail. The effective value type tester may not measure correctly the voltage of phase control wave profile. (Standard values of the next page are also ones measured by the average value type tester.)

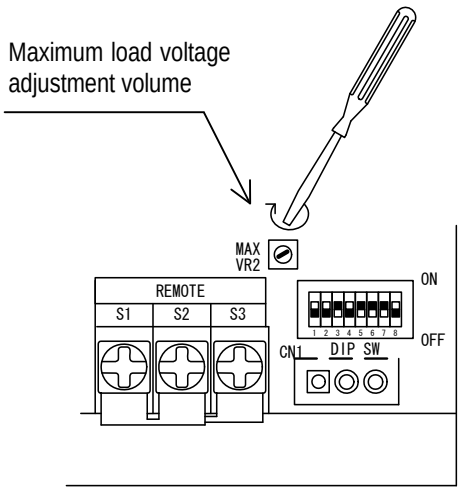


(2) Adjustment of the maximum load voltage

If the maximum load voltage (output voltage when the speed adjustment knob is fully turned in the clockwise direction) is different to large extent (permissible value ±5V) from those in the table of the next page, adjust it using the maximum load voltage adjustment volume (Refer to P.6 for the location of the volume). When the volume it turned in the clockwise direction, the voltage increases (If it is turned excessively, the output voltage decreases. In this case, return it in the counterclockwise for readjustment.). This voltage setting is a limiter to prevent the overload of magnet for operation. If this setting is wrong, the magnet may be burnout. Please pay enough attention to it. The adjustment must be performed by engineers with electricity knowledge.

⚠ Caution

If adjustment of the maximum load voltage is wrong, magnet for drive may be burnout.



(3) Maximum load voltage table

- After the changeover of DIP switch, Please confirm the maximum value of load voltage without fail..
- Please refer to the previous page for the measurement and adjustment method of load voltage.
- Values of the following table are those by the average value type tester. (Refer to the previous page.)

Power source voltage		100V(*1)				200V(*1)			
Driving system		Full wave		Half wave		Full wave		Half wave	
Frequency		50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Main body type	K10,K14,K16,N25	80V	100V	–	–	160V	200V	–	–
	K20	80V	100V	55V	70V	160V	200V	140V	170V
	N32,N40,G50	–	–	–	–	160V	200V	140V	170V
	S05,S08*2	80V	100V	–	–	160V	200V	–	–
	S10,L20	80V	100V	–	–	160V	200V	–	–
	S20	80V	100V	55V	70V	160V	200V	110V	140V
	S30	–	–	–	–	–	–	140V	170V
	M05,M10	80V	80V	–	–	160V	160V	–	–
	V7	–	–	55V	70V	–	–	140V	170V
	V01,V03,V04,V06,V08	–	–	55V	70V	–	–	140V	170V
	SV1,SV3	–	–	–	–	–	–	140V	170V
	SV01,SV03	–	–	55V	70V	–	–	110V	140V
	SV06,V12	–	–	–	–	–	–	140V	170V

＊1 Match to the maximum load voltage value in the 100V column for power source voltage 100V~115V and in the 200V column for power source voltage 200V~230V.

＊2 Use the EGA17 type controller for the control of S05 and S08 main bodied.

＊3 When the power source voltage is 100V or 200V or less at 60Hz of full wave drive, make [power source voltage – 5V] as a target of set value.

＊4 Value of underlined voltage does not match only by changeover of the DIP switch. After setting of the DIP switch, please adjust the voltage with the maximum load voltage adjustment volume.

＊Replacement method of fuse

Refer to P.22 for the applicable fuses.

> ⚠ Warning
> In case of replacing a fuse, make sure to switch off the main power source and the work must be performed by engineers.

1. Switch off the main power source (main breaker) to stop the power distribution to the controller.
2. Search the cause of blowout of a fuse and apply an appropriate countermeasure.
3. Loosen the panel fixing screw and open the panel. (Refer to P.12)
4. Remove the fuse from the fuse clip (Refer to P.6 for the location)
5. Insert a new fuse with the same rating with the blowout fuse (check such as rated current/voltage) into the fuse clip. Dispose the blowout fuse in an appropriate manner.
6. Close the panel to the original position and fix it with screws.
7. After confirming the safety, power on the main power source (main breaker).

10. Troubleshooting

Please investigate the following points if a trouble occurs by any chance. In addition, check the output voltage (Refer to P.42) for the case of paragraphs of (2) and (3). When the cause is not clear and it needs to consult NTN on the troubling state, please inform of the content in detail and concretely with referring the followings in order to be able to take measures as soon as possible.

Contents of troubles	Estimated causes	Reference pages/documents/measures
(1) It doesn't vibrate.	・Wrong connection of power supply or specification	Check it referring to the paragraph of the specification in P.22.
	・Wrong Wiring	Refer to I/O connection method in P.11.
	・Broken fuse	Checks it referring to the paragraph of the specification in P.22.
	・Between S1-S2 and S2-S3 are not short circuited.	Check the external control signal ON, referring to the paragraph of the wiring for outside control input in P.14.
(2) The vibration doesn't increase.	・Wrong connection of power supply or specification	Check it referring to the paragraph of the specification in P.22.
	・Setting error of voltage, frequency and the driving system.	Refer to the setting of DIP switch in P.16~
	・Broken leaf spring	Refer to the manual for the main body.
	・It is fixed with metal fittings for transportation.	Refer to the manual for the main body.
	・Loose leaf spring	Refer to the manual for the main body.
	・Overweight of bowl/chute	Refer to the parts feeder guide book.
(3) The vibration fluctuates.	・The power-supply voltage exceeds the permissible value of the controller and fluctuates.	Check voltages of the power supply and the output, and remove the cause of the voltage fluctuation.
	・It is in the resonance state.	Refer to the manual for the main body.
	・The amount of works in the bowl changes greatly.	The amount of works charged is made uniform.
(4) The control from the outside is not effective.	・Wrong wiring	Check the connection of wiring, referring to the paragraph of the wiring for the external control input in P.14 and after.
(5) Indication lamp does not light up.	・Setting or specification of power source is wrong.	Check referring to the paragraph of specification of P.22.
	・Blowout of fuse	Check referring to the paragraph of specification of P.22.

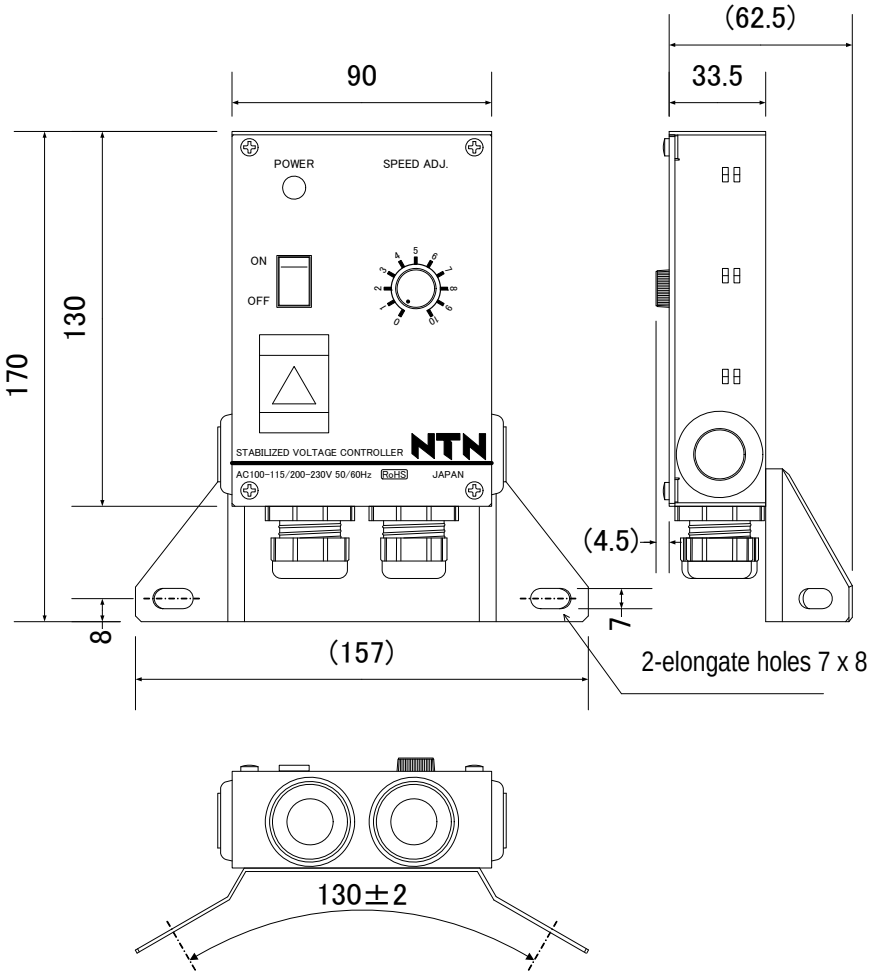
11. Specification

Part number		K-EGA57	K-EGA17
INPUT	Power supply	AC100V to 115V/AC200V to 230V±10% 50/60Hz	
	Rated current (Consumption current)	5A (Rated current of vibration main body connected＋0.1A)	0.4A (Rated current of vibration main body connected＋0.1A)
OUTPUT	Control method	Phase control (Full wave/Half wave changeover)	
	Capacity of control rating	5.0A	0.3A
	Voltage setting range	0 to 95V/0 to 195V *1 (Interlocking to power source voltage changeover)	
Adaptive function	Constant voltage function	Fluctuation of output voltage ±3% or less for the fluctuation of power supply voltage of ±10%*2	
	External control input	Drive and stop are possible by external signal.	
	Others	Soft start (0~1 second, 8 stages setting)	
Fuse		5A	0.5A
		[Fuji Terminal Industry Co., Ltd. FGMB AC250V φ5.2×20 or the equivalent]	
Noise immunity		1000Vp (Pulse width 1μsec, by noise simulator)	
Ambient temperature, humidity		0 to +40℃, 35～85％RH (No condensation allowed)	
Protection structure		IP 20	
Ambient atmosphere (Contamination level)		Contamination level Ⅱ, Height: 1000m or less However, there must not be corrosive gas. The substances giving trouble to electronic parts, resins, and sheet metals such as awful dust, water, oil and solvents must not splash.	
Mass		Approx. 0.5kg	
Applicable vibration main body		K10~K20, N25～N40,G50・1, S10~S30, L20, M05･M10, V07, V01~V12, SV1, SV3, SV01~SV06	S05, S08

∗1 It is for the power supply voltage of 200V (100V) or more. When the power supply voltage falls, the maximum output voltage is limited by the power supply voltage.

∗2 The output voltage stability level is a value when the setting of the output voltage is 60-170V (200V power supply) and 30-80V (100V power supply).

[Outside dimension diagram]



※ Please refer to P.7~9 for details of mounting.

・This manual might be changed without notice for the function improvement etc.

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NTN

NTN **Technical Service Corporation**

1578 Higashi-Kaizuka, Iwata, Shizuoka 438-8510 Japan
PHONE : 81-0538-37-8104 FAX : 81-0538-37-8128