

SPEED CONTROLLER AND CONTROL MOTORS

INDEX

CHARACTERISTICS OF SPEED CONTROL MOTORS	140
UNIT(CONNECTOR) TYPE CONTROL MOTORS	
ANALOGUE TYPE SPEED CONTROLLER	144
DIGITAL TYPE SPEED CONTROLLER	148
UNIT TYPE SPEED CONTROL MOTOR	155
PACK TYPE CONTROLLER AND CONTROL MOTORS	
SR TYPE SPEED CONTROLLER	174
SR CE TYPE SPEED CONTROLLER	180
SS TYPE SPEED CONTROLLER	187
SS STANDARD TYPE SPEED CONTROLLE	190
SS HIGH OUTPUT TYPE SPEED CONTROLLE	200
PACK TYPE SPEED CONTROL MOTORS	210
SPEED CONTROL INDUCTION MOTOR	211
SPEED CONTROL REVERSIBLE MOTOR	235
SPEED CONTROL ELECTROMAGNETIC BRAKE MOTOR(E · S MOTOR)	251



CODING SYSTEM

MOTOR

MAKER	SIZE	MOTOR TYPE	OUTPUT	SHAFT TYPE	VOLTAGE	GEAR TYPE	SPECIAL TYPE
S	9	I	40	G	B	H	E

S : SPG Co., Ltd.

SIZE

- 6 : □60(mm)
- 7 : □70(mm)
- 8 : □80(mm)
- 9 : □90(mm)

MOTOR TYPE

- I : Induction Motor
- R : Reversible Motor

OUTPUT

03 : 3W	90 : 90W
06 : 6W	120 : 120W
15 : 15W	150 : 150W
25 : 25W	180 : 180W
40 : 40W	200 : 200W
60 : 60W	

SHAFT TYPE

- G : Gear Type
- S : Straight Type
- D : D-Cut Type
- K : Key Type

VOLTAGE

A : 1∅AC 110V	60Hz	(4Pole)
B : 1∅AC 220V	60Hz	(4Pole)
C : 1∅AC 100V	50/60Hz	(4Pole)
D : 1∅AC 200V	50/60Hz	(4Pole)
E : 1∅AC 115V	60Hz	(4Pole)
X : 1∅AC 220~240V	50Hz	(4Pole)
U : 3∅AC 200V	50/60Hz	(4Pole)
T : 3∅AC 220V	50/60Hz	(4Pole)
S : 3∅AC 380~440V	50/60Hz	(4Pole)

GEAR TYPE

- H : Heavy Impact
- L : Light Impact

SPECIAL TYPE

- E : Electro-magnetic Brake Type
- T : Terminal Box Type(Terminal Block Type)
- T1 : Terminal Box Type(PCB Type Terminal Block) (25~90W)
- T2 : Conduit Box Type(25~90W)
- B : Semi-Brake Type
- S : Variable Speed Control(Pack Type)
 - S12 : T.G Voltage 12V Type
 - S24 : T.G Voltage 24V Type
- V : Variable Speed Control(Unit Type)
 - V12 : T.G Voltage 12V Type
- ES : Electro-Magnetic Brake Variable Speed Control(Pack Type)
 - ES12 : T.G Voltage 12V Type
 - ES24 : T.G Voltage 24V Type

※ NOTE 1) 'H' & 'L' type are applied to over 40W.
 • 'H' type is the standard for over 60W.
 • 'L' type is the standard for over 40W.

※ NOTE 2) Key Type are applied to over □80 15W

SPEED CONTROLLER (SR PACK TYPE)

CONTROLLER TYPE	VOLTAGE	OUTPUT
SR	B	01

SR SERIES

※ NOTE) The applicable motor is for T.G. 12V.

CONTROLLER TYPE

VOLTAGE

- A : 1∅ AC110V 60Hz (4Pole)
- B : 1∅ AC220V 60Hz (4Pole)
- C : 1∅ AC100V 50/60Hz (4Pole)
- D : 1∅ AC200V 50/60Hz (4Pole)
- E : 1∅ AC115V 60Hz (4Pole)
- X : 1∅ AC220~240V 50Hz (4Pole)

OUTPUT

- 01 : 6W
- 02 : 15W~90W

SPEED CONTROLLER (SS PACK TYPE)

CONTROLLER TYPE	VOLTAGE	OUTPUT	RUN / STOP TYPE
SS	B	01	SRSS

SS SERIES

※ NOTE) The applicable motor is for T.G. 24V.

CONTROLLER TYPE

- A : 1∅ AC110V 60Hz (4Pole)
- B : 1∅ AC220V 60Hz (4Pole)
- C : 1∅ AC100V 50/60Hz (4Pole)
- D : 1∅ AC200V 50/60Hz (4Pole)
- E : 1∅ AC115V 60Hz (4Pole)
- X : 1∅ AC220V~240V 50Hz (4Pole)

OUTPUT

- 01 : 6W(Standard Type)
- 02 : 15W~40W(Standard Type)
- 03 : 6W~90W(High Output Type)

RUN / STOP TYPE

SRSS : Slow Run Slow Stop

SPEED CONTROLLER (UNIT TYPE)

MAKER	CONTROLLER TYPE	OUTPUT	TYPE	VOLTAGE	T.G VOLTAGE
S	U	A	40	I B	V12

V12 : T.G Voltage 12V Type

A	: 1Ø AC110V	60Hz	(4Pole)
B	: 1Ø AC220V	60Hz	(4Pole)
C	: 1Ø AC100V	50/60Hz	(4Pole)
D	: 1Ø AC200V	50/60Hz	(4Pole)
E	: 1Ø AC115V	60Hz	(4Pole)
X	: 1Ø AC220~240V	50Hz	(4Pole)

I : Induction Motor
 ※ NOTE) Unit Type of Speed Controller does not have Reversible Motor.(715 Type : No marking)

06	: 6W	25	: 25W	90	: 90W
715	: 15W(□70)	40	: 40W	120	: 120W
15	: 15W(□80)	60	: 60W	180	: 180W

A : Analogue Type
 D : Digital Type

U : Unit Type

S : SPG Co.,Ltd.

BRAKE PACK (CONTACT TYPE)

BRAKE TYPE	VOLTAGE	MOTOR TYPE
SB	B	IR

IR : 1Ø Motor
 I : 3Ø Motor

A	: 1Ø AC 110V	60Hz	(4Pole)
B	: 1Ø AC 220V	60Hz	(4Pole)
C	: 1Ø AC 100V	50/60Hz	(4Pole)
D	: 1Ø AC 200V	50/60Hz	(4Pole)
X	: 1Ø AC 220~240V	50Hz	(4Pole)
U	: 3Ø AC 200V	50/60Hz	(4Pole)
T	: 3Ø AC 220V	50/60Hz	(4Pole)
S	: 3Ø AC 380~440V	50/60Hz	(4Pole)

SB SERIES

GEAR HEAD

MAKER	SIZE	SHAFT TYPE	OUTPUT	GEAR RATIO	BEARING TYPE	SHAFT IMPACT TYPE	SPECIAL TYPE
S	9	K	C	36	B	H	S

S : Flange Type

※
 H : Heavy Impact
 L : Light Impact

B : Ball bearing + Metal bearing(6W~40W)
 All Ball bearing(60W MIN)
 B1: All Ball bearing(6W~40W)
 M : Metal bearing(6W~40W)

Reduction Ratio(36:1/36)

T	: 3W	C	: 60W~120W
A	: 6W~25W	D	: 60W~120W
B	: 40W	H	: 150W~200W

S : Straight Type
 D : D-Cut Type
 K : Key Type

6	: □60(mm)
7	: □70(mm)
8	: □80(mm)
9	: □90(mm)

※ NOTE) 'H' & 'L' type are applied to over 40W.
 • 'H' type is the standard for over 60W.
 • 'L' type is the standard for over 40W.

S : SPG Co.,Ltd.

BRAKE PACK (NON CONTACT TYPE)

BRAKE TYPE	VOLTAGE	SPECIAL TYPE
SB	B	NCR

NCR : Non Contact Relay
 ENCR : Brake type Non Contact Relay

A	: 1Ø AC 110V	60Hz	(4Pole)
B	: 1Ø AC 220V	60Hz	(4Pole)
C	: 1Ø AC 100V	50/60Hz	(4Pole)
D	: 1Ø AC 200V	50/60Hz	(4Pole)
X	: 1Ø AC 220V~240V	50Hz	(4Pole)

SB SERIES

CHARACTERISTICS OF SPEED CONTROL MOTORS



1. Characteristics of Speed Control Motors

- By using it with the speed controller, a wide range of speed can be controlled (50Hz: 90~1400rpm, 60Hz: 90~1700rpm). The speed can be controlled easily with the speed controller.
- Depending on the type of speed controller, it can be combined with the motor for various purposes such as speed-control, braking, slow run, slow stop, etc.
- Built in T.G(Tacho Generator) to control the feedback. Thus, even if the power frequency changes the rotating numbers does not change.
- When the speed control motor with an electronic brake is used instantaneous braking and electronic braking operate simultaneously for strong braking power.
- The speed control motor with an electronic brake also has a non-excitation run type of electronic brake. Even if the power is off, braking remains active to maintain braking of a load.
- There are 3 types of speed control motors: induction motor, reversible motor and speed control motor, all with an electronic brake. An appropriate motor should be selected depending on its usage.
- Output range of the induction motor is 06W~90W (unit types are 06W~180W). The reversible motor has an output range of 06W~40W and the electronic brake motor has an output range of 06W~40W (However, SR types are 06W~90W).

2. Selection Method

(1) Selection of motor and controller

- Is speed control needed only?
- Is instantaneous braking needed?
- Is maintenance of braking power needed?
- How much is the output of the applicable motor?
- Are the slow run, slow stop functions needed?

(2) Selection of gear ratio of gearhead

- When the number of rotations of the output shaft of the gear requires A rpm to B rpm, the gear ratio is calculated by using the higher number of rotations (B rpm).
- For the AC speed control motor, the number of rotations for the motor is calculated with 1300rpm. (1300 rpm is used as a numerator since the largest output torque is required and 1300 rpm is most frequently used). Use the nearest approximated value of the gearhead (gear ratio = i)

$$\text{at Gear Ratio } i = \frac{1300[\text{rpm}]}{B[\text{rpm}]}$$

(3) Highest number of rotations and lowest number of rotations of the motor shaft

- When the highest number of rotations is NH and the lowest number of rotations is NL, they are as follows.
- Highest number of rotations of the required motor : $NH = B \times [rpm]$
- Lowest number of rotations of the required motor : $NL = A \times [rpm]$

(4) Required torque of the motor

The required torque of the motor is found as follows.

$$T_M = \frac{T_L}{i \times \eta} \quad [\text{g} \cdot \text{cm}]$$

T_M : required torque of the motor [g · cm]

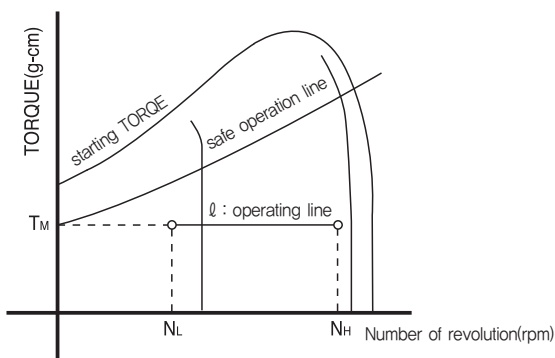
T_L : torque necessary to operate actual load [g · cm]

i : reduction ratio η : efficiency of the gearhead

(5) Selection of the motor

- The motor is decided by the required torque T_M , rotational frequencies $NL \sim NH$ and the torque-number of rotations curve (hereafter, N-T curve). When selecting an AC speed control motor, choose the motor with its operating line below the safe operation line shown in (Fig. 1)

(Even in the area above the limit curve, the motor can be used without any problems as long as the surface temperature remains below 90°C.



<Fig.1> Torque-Number of revolutions (N-T) curve

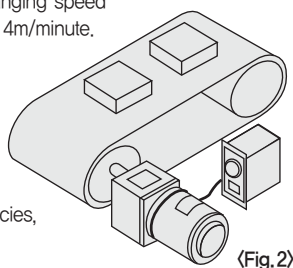
(6) Selection of gearhead

- After the motor is selected, the gearhead should be decided with consideration of the torque size of the load. Confirm that the torque of the load is within the torque allowed by the gearhead.

3. Example of selecting the appropriate motor

Conditions: One way rotation, changing speed within 1m/minute, 2m/minute and 4m/minute.

Drum diameter : 10cm
 Operating torque : 30kg · cm
 Power : single phase 110V 60Hz
 instantaneous braking in emergencies,
 but no holding power.



<Fig.2>

(1) Motor and controller

- Rotation is in one direction and there is no holding power. Therefore, the induction motor is selected.

(2) Revolutions of output shaft of gearhead

- The number of rotations of the gearhead shaft when the belt conveyor speed is 1m/minute.

$$\text{Number of rotations} = \frac{\text{Speed of belt conveyor}}{\text{Outer diameter of drum}} = \frac{100}{10\pi} \approx 3.18[\text{rpm}]$$

- Number of rotations of the gearhead shaft when the belt conveyor speed is 2m/minute.

$$\text{Number of rotations} = \frac{\text{Speed of belt conveyor}}{\text{Outer diameter of drum}} = \frac{200}{10\pi} \approx 6.37[\text{rpm}]$$

- Number of rotations of the gearhead shaft when the belt conveyor speed is 4m/minute.

$$\text{Number of rotations} = \frac{\text{Speed of belt conveyor}}{\text{Outer diameter of drum}} = \frac{400}{10\pi} \approx 12.74[\text{rpm}]$$

(3) Gear ratio

- The gear ratio is calculated using the higher number of rotations of the gearhead.

$$\frac{\text{Number of rotations of the motor}}{\text{Number of rotations of the gearhead}} = \frac{1300}{12.74} \approx 102$$

The nearest approximated reduction ratio is 1/100.

(4) Number of rotations of motor shaft

- The number of rotations of the motor shaft is calculated by the number of rotations of the gearhead shaft × reduction ratio for each speed of the belt conveyor.
 - 3.18 × 100 = 318 [rpm]
 - 6.37 × 100 = 637 [rpm]
 - 12.74 × 100 = 1274 [rpm]

(5) Required torque of motor

The transfer efficiency of a gear head with gear ratio 100 is 66%, so the required torque of the motor is

$$\frac{\text{operating torque}}{\text{gear ratio} \times \text{Efficiency}} = \frac{30}{100 \times 0.66} \approx 0.45 [\text{kg} \cdot \text{cm}]$$

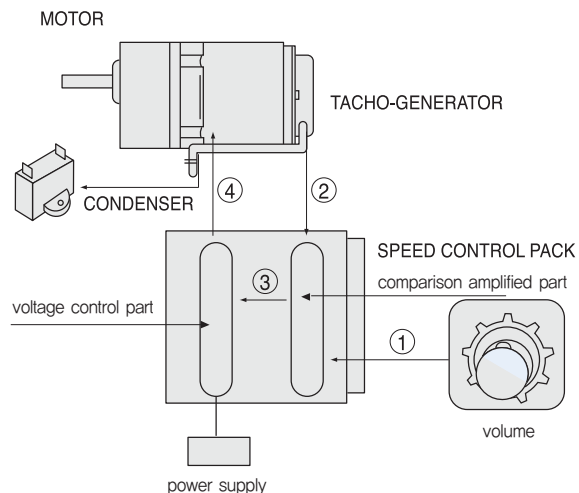
(6) Selection of motor

- From the N-T curve of the induction motor, the S8125GB-V12 motor and the S8KA100B gearhead can be combined to use. However, in such a case, make sure that the inertia load should fall within the specification of the selected motor.

4. The Principle of Speed Control

(1) The Principle of Speed Control

- <Fig. 3> shows is the basic speed control structure of the close loop current control method. The followings are explanations of close loop speed control.

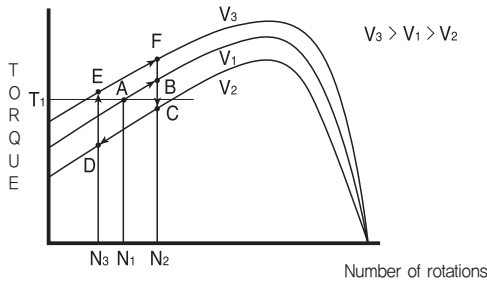


<Fig.3> Basic structure of speed control for the close loopvoltage control method

- If Tacho-Generator changes the voltage that is proportional to the rotations, make comparison between the number of rotations of the motor and the voltage preset by the volume.
- This difference in voltage is called "comparative voltage".
- Comparative voltage operates the motor through the voltage amplifier and the voltage controller.
- Comparative voltage is mostly controlled by zero-crossing. Number of rotations is decided by the value that the speed controller selects.
- Even when the load changes, the number of rotations does not change. When the Tacho-Generator changes, the number of rotations immediately changes with the value.
- Accordingly, CLOSE LOOP speed control detects the number of rotations of the motor and controls the operating voltage to maintain it constantly.

(2) Primary voltage control by CLOSE LOOP

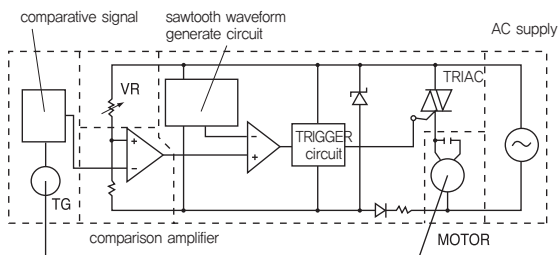
- (Fig. 4) shows the relationship between the torque of the induction motor and the number of rotations as applied voltage (primary voltage) changes.



(Fig.4)

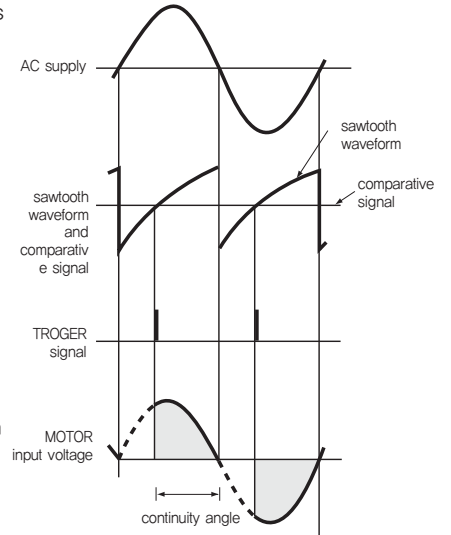
- Point A indicates current voltage (V_1), torque of the load (T_1), and the number of rotations (N_1). When rpm increases to N_2 and voltages changes to V_2 , torque of the load changes to C
- At C, the torque of the load T_1 is larger than the torque of the motor, thus the number of rotations drops below N_2 .
- When the number of rotations becomes N_3 and the voltage is raised to V_3 , then the generated torque becomes larger than the torque of the load to move to E, and then the speed increases toward F.
- To stabilize the number of rotations, it has to make loop smaller like $C \rightarrow D \rightarrow E \rightarrow F$ by controlling the primary voltage.
- During the primary voltage control by close loop, to meet the changes according to the number of rotations of the motor, it should have the primary voltage controlled and maintain the number of rotations constant.

(Fig.5)



(3) Operation of speed controller

- The speed controller is explained in (Fig. 5.)
- Number of rotations of the motor comes from the Tacho-Generator through feedback voltage through the rectifying circuit.
- The difference between the selected voltage of the speed controller which was controlled in the VR and the feedback voltage is amplified in the comparative amplifier.
- A trigger signal is generated from the sawtooth waveform which comes from the sawtooth waveform generator, comparator from the comparative signal and triac from the trigger circuit.
- The angle of the triac is controlled with the trigger signal to control voltage in the motor.
- This makes the number of rotations of the motor constant, thereby controlling it. Refer to (Fig. 6).

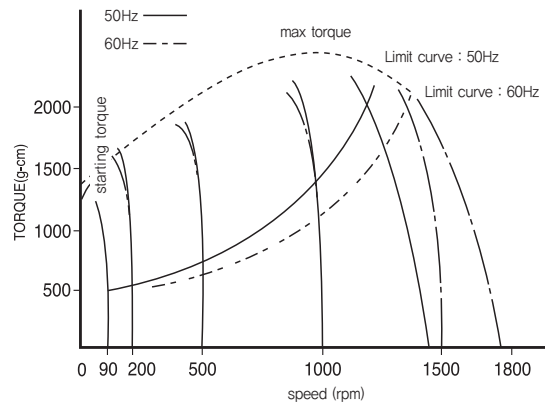


(Fig.6)

5. Limit of Use

(1) Limit curve

- In the AC speed control motor N-T graph (Fig. 7), the area below the Limit curve is called the continuous operation area.



(Fig.7) Torque-number of revolutions N-T curve

- The limit curve does not go beyond the highest temperature allowed by the motor (continuous for induction motors and 30 minutes rating for reversible motors) and because continuous operation is possible Limit curve does not go beyond the highest temperature within its continuous operation(continuous for induction motors, 30 minutes rating for reversible motors), and the curve is decided by the motor's temperature, is decided by the temperature of the motor.

- Our speed control motor has a class E insulation and the permitted temperature of the winding section is 120°C. Therefore, if the temperature of the winding section is less than 120°C, continuous operation is possible. But since measuring the temperature of the winding section is difficult, continuous operation is generally possible when the surface temperature of the motor housing is less than 90°C. The temperature difference between the winding section and the housing surface is generally around 10°C to 20°C, but may vary depending on the type of the motor.

(2) Surface temperature of 90°C or less

- The highest part of the motor's rising temperature is the winding section. Thus, the highest allowable temperature is decided by the insulation level of the winding section. (SPG's small AC motors have a class E insulation and the highest allowable temperature is 120°C.)
- The difference between the temperature of the surface of the motor and the winding section is about 10°C~20°C. (A motor with a cooling fan has about 30°C difference because the cooling fan cools the surface of the motor.)
- When the temperature of the winding section is 120°C, the surface temperature is about 100°C. Therefore 90°C is the sufficient value.

ANALOGUE TYPE SPEED CONTROLLER



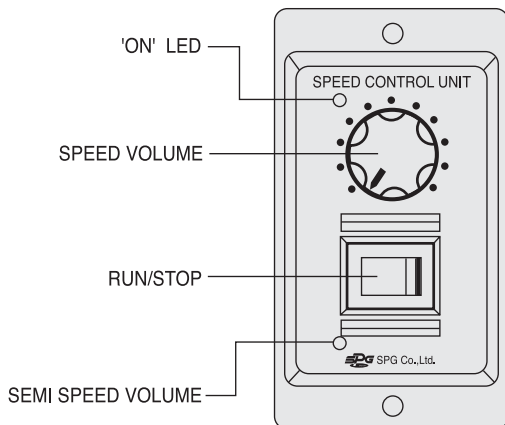
1. How to use

(1) Operation

- 1) The speed control unit and the lead wire connector of the motor are connected and then the plug cord is connected to AC power.
- 2) When the 「RUN/STOP」 switch of the control unit is switched to 「RUN」, it turns clockwise.
- 3) The product is made so that it will rotate in the clockwise direction. However, at times, due to gear ratio, the gearhead shaft rotates counterclockwise.

(2) Speed control

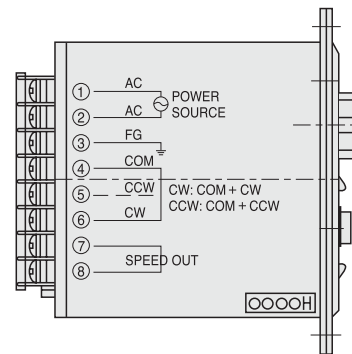
- 1) If the 「SPEED VOLUME」 switch of the analogue type speed controller is turned clockwise, number of rotation of the motor increases and when turned counterclockwise, it slows down.
- 2) It is possible to control and designate the speed of the motor between 90[rpm]~1400[rpm] at 50Hz and 90[rpm]~1700[rpm] at 60Hz.



〈Fig.1〉 Front of the analogue type speed controller

(3) Stop

- 1) If the 「RUN/STOP」 switch of the analogue type speed controller is switched to 「STOP」, the motor stops.
- 2) This switch is not an on-off switch for power. When the motor needs to be stopped for a long time, a separate power source should be installed and turned off.



〈Fig.2〉 Side of the unit type speed controller

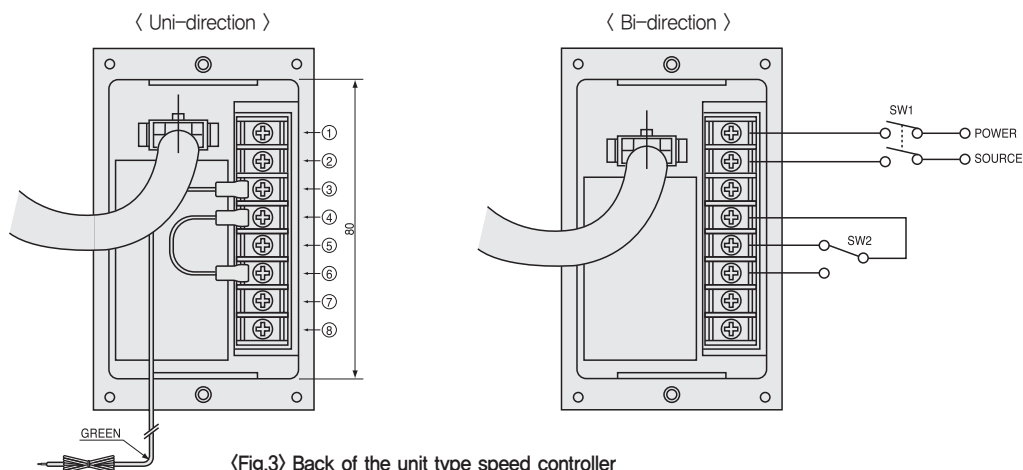
(4) Changing of rotation direction 〈Fig.3〉

1) Continuous operation by uni-direction

- When ④COM and ⑤CCM are connected, the motor will rotate in an opposite direction with that of the conveyer unit.
- Power cords should always be connected to the ①AC and ② AC terminals. Make sure the unit is off when connecting.

2) Normal/reverse operation

- Install the power supply switch (SW1) and the switch (SW2) to changeover between normal and reverse direction as shown in 〈Fig. 3〉 to change the direction of rotation.
- The motor should completely stop after the power switch (SW1) is turned off in order to turn switch (SW2) on. Therefore, instantaneous reverse is not possible.



(Fig.3) Back of the unit type speed controller

Switch number	Switch contact capacity
SW1	AC 125V or AC 250V more than 5A
SW2	AC 125V or AC 250V more than 5A

(5) SPEED OUT

- ⑦ and ⑧ are jacks to connect the rpm meter.
- 1) Number of rotation can be seen by connecting a digital display rpm meter(both of Digital and Analogue).
- (Note) Use the spec, suitable as 2000 rpm, AC 10V products.

3. Combination

- There are 2 ways to combine the control unit

(1) Combination by making a rectangular hole

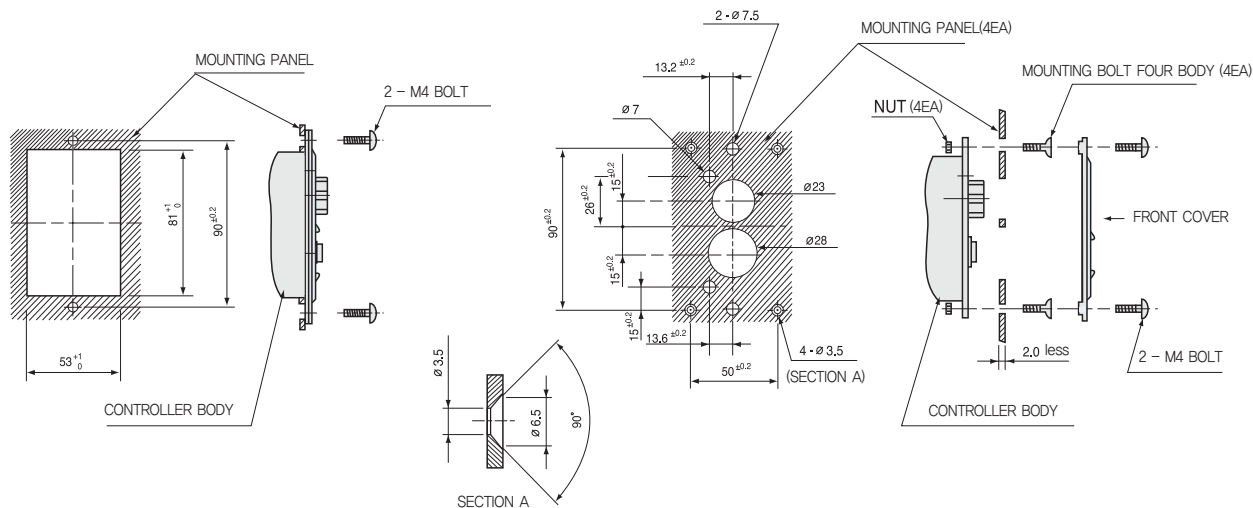
(Refer to Fig. 4A)

- 1) Make rectangular holes in the combination panel.
- 2) Assemble the main body of the controller and the front cover so that the controller body fits in the rectangular holes of the panel. Use M4 bolts and nuts to fix.

(2) Combination without making a rectangular hole

(Refer to Fig. 4B)

- 1) Make holes in the combination panel.
- 2) Separate the main body of the controller and the front cover.
- 3) Put the controller surface in the combination panel hole and fix with M3 flat-head bolts and nuts.
- 4) Attach the front cover of the controller to the combination panel and fix with M4 bolts and nuts.
- 5) The combination panel should be less than 2mm thick.



(A) Combination by making a rectangular hole

(B) Combination without making a rectangular hole

(Fig.4) Analogue controller combination

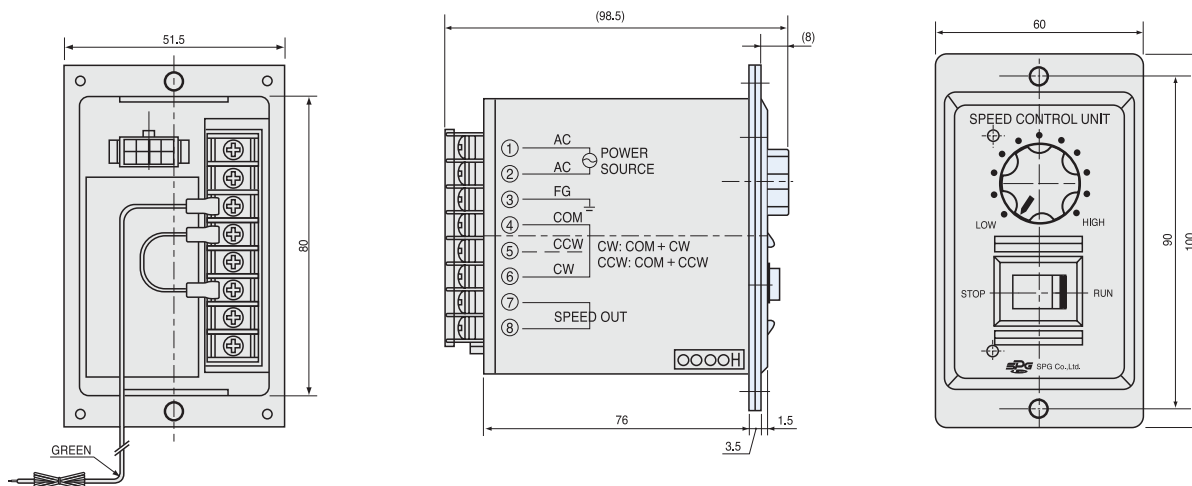
4. SPECIFICATIONS

SPEC \ MOTOR	SUA□IA-V12	SUA□IB-V12	SUA□IC-V12	SUA□ID-V12	SUA□IX-V12
Rated Voltage	AC 110V	AC 220V	AC 100V	AC 200V	AC 220V~240V
Operation Voltage Range	±10%				
Power Source Frequency	60Hz	60Hz	50/60Hz	50/60Hz	50Hz
Speed control range	60Hz : 90~1700rpm 50Hz : 90~1400rpm				
Speed variation	5%(Standard)				
Speed setting device	Built in external speed setting device attachable				
Slow run Slow stop	None				
Operation Temperature	0~40°C				
Storage Temperature	-10~60°C				
Ambient humidity	85% Maximum(non condensing)				

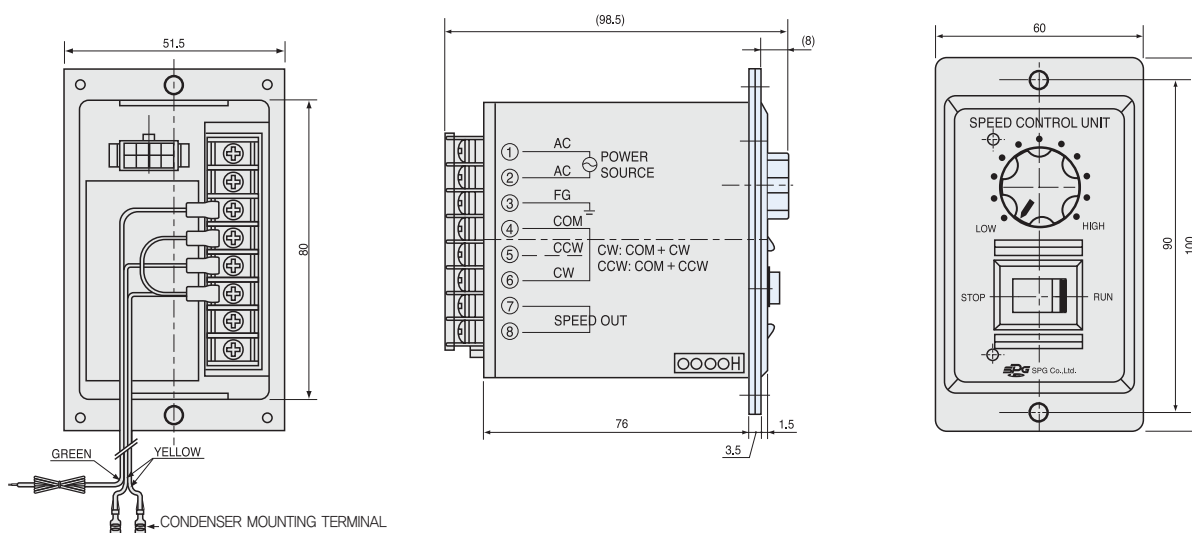
DIMENSIONS

+ SPEED CONTROLLER (SCALE = 1/2)

- 180W and below (interior condenser)
 - Except for over 60W 110V types



- 60W and over (exterior condenser)
 - 110V types



DIGITAL TYPE SPEED CONTROLLER



1. Function chart

- Automatic computer control

Function	Contents
Change rotating direction	CW/CCW terminals(Default setting: Clockwise)
Run / Stop	Operated with RUN/STOP Key
Set RPM	Set digital(multiple magnification unit, 10rpm)
Set mark magnification	Set with Gear ratio(refer to gear ratio chat) & multiple magnification(Unit 0,005)
SLOW RUN SLOW STOP	0.1 sec. ~ 30 sec.(Unit 0.1)
POWER-ON/OFF	Set the mode when power is supplied
LOCK Function	Prevents malfunctions
Setup Parameters	Setup for powering off and saving the parameters

2. How to use

(1) Power on/off Switch (Default setting: 'NO')

The following features the functions when the power is supplied.

YES	It keeps running even when the power is off, if set to "Run". It stops when the power is off, if set to "Stop".
NO	It stops regardless of "Run/Stop".

- Setting up to "NO" can help prevent unexpected dangers.
- **When using "YES" mode** (Please use in set mode)

The user can remotely control "RUN/STOP" regardless the power is on or off.

- Installation**
1. Set the switch to 'YES' when power is on
 2. Operate RUN/STOP once when power is on (It recognizes YES)

Caution

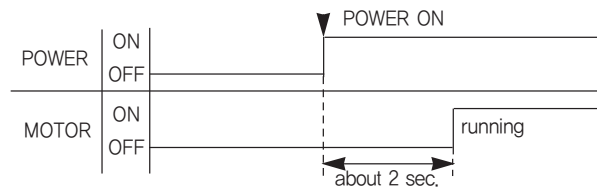
1. It takes about 2 seconds to commence operation after the power is supplied.
2. Both "Run" and "Stop" may lighten up when the "Run/Stop" key is used over 10,000 times. In such a case, alter the switch to "No" for a second to restore its normal condition.

(2) Restoration after a blackout

The conditions will be restored in a same manner before the blackout occurred.

(3) Reset time

Reset time takes approximately 2 seconds. No digital indication will be made while resetting.



Operate the key after digital signal is on.

When "Run/Stop" key is set to "Run" before turning the power off, it will take 2 seconds to run when the power is supplied. Reset time applies to post-blackout as well.

(4) Automatic alteration of frequency

When set as 1400 rpm ~ 1800 rpm at 60 Hz, rpm becomes at 1500 at 50 Hz, but when set as 1500 rpm at 50 Hz, rpm remains 1500 even when Hz increases to 60.

(5) Trouble Indications

Whenever trouble occurs, "Run" and "Stop" signals are both indicated. It may be restored and set to default setting when the power is resupplied. If the trouble is not resolved after resupplying the power, please contact SPG's R&D department or refer to 7. Troubleshooting.

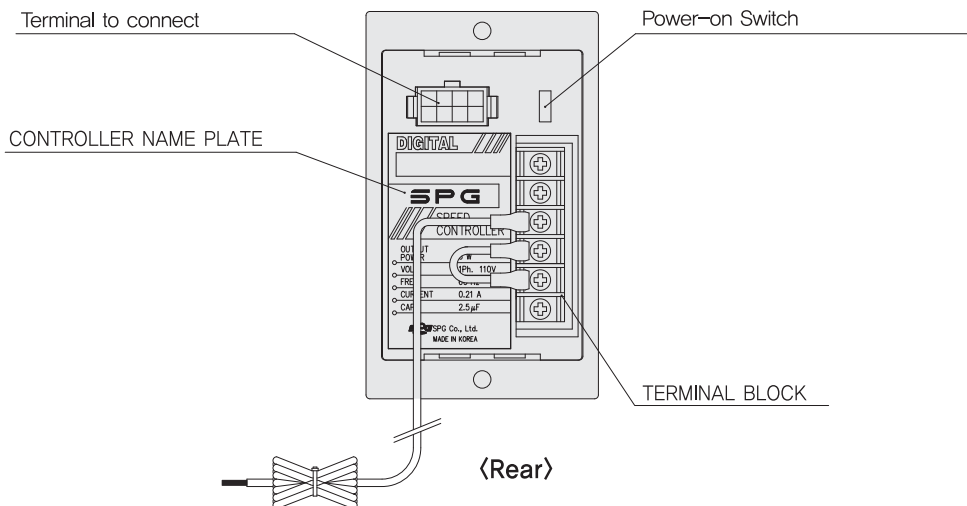
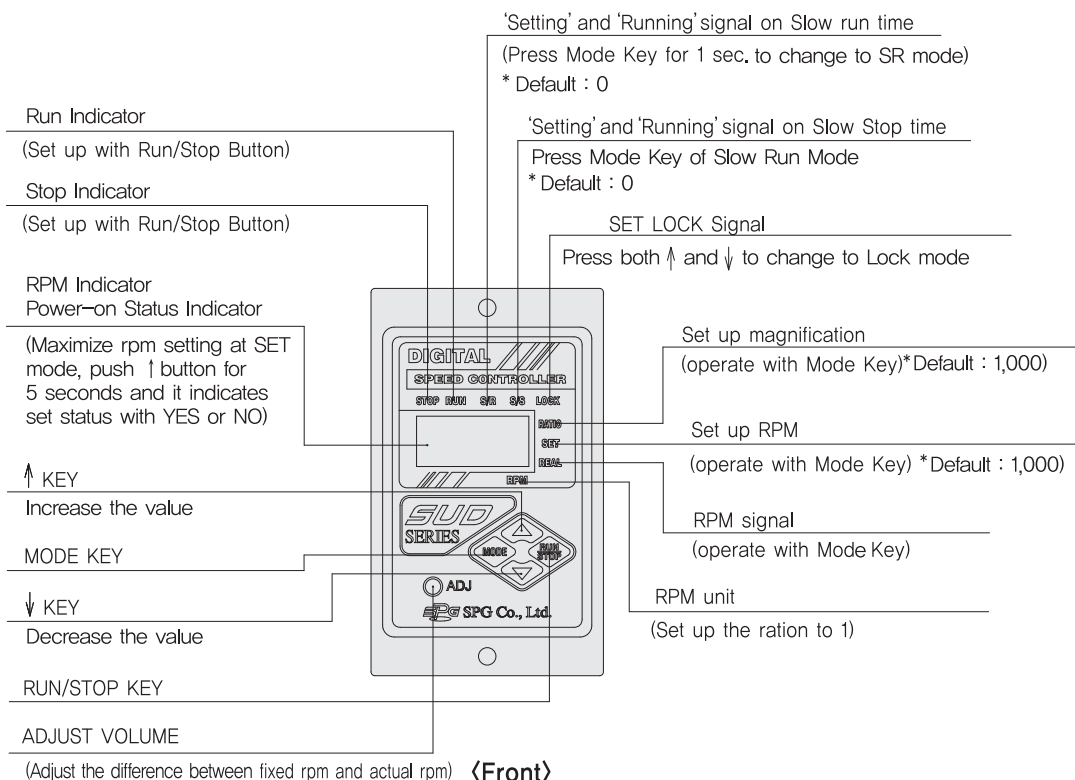
(6) Thermal protector

A thermal protector (TP) is installed in a motor to prevent the motor from overheating. When the motor overheats, the TP activates to stop the motor. It automatically deactivates when the motor cools down and start the motor again.

(7) Test for withstand voltage & Impulse voltage

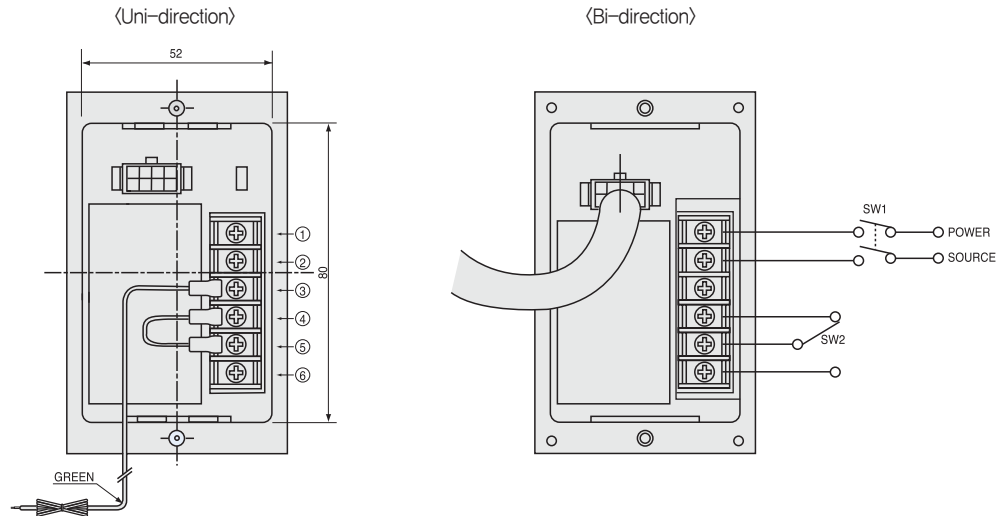
Need to disconnect of two power codes from outer motor wire in the case of withstand voltage testing with line earth, impulse voltage testing and testing of heat transfer resistance.

3. Parts names and functions



4. Usage

(1) Transformation of rotation direction



(Fig.3) Rear side of the digital type speed controller

1) Uni-direction continuous operation

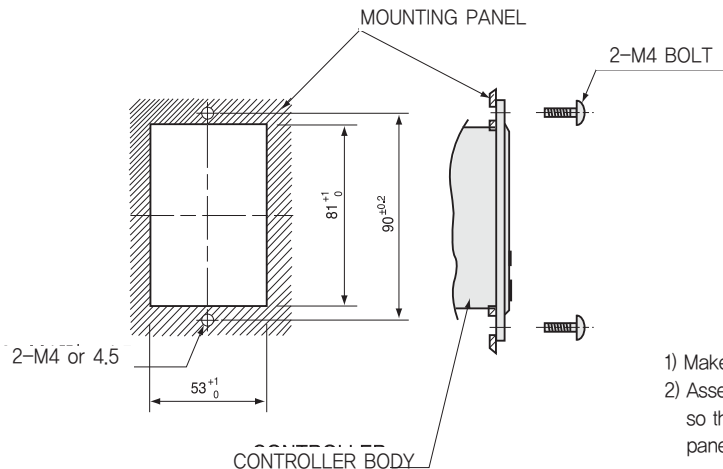
- To reverse the direction of rotation from clockwise to counter-clockwise, connect ⑤COM and ⑥CCW instead of connecting ⑤ COM and ④CW.
- Power cords should always be connected to ①AC and ②AC terminals. Do not forget to turn the power off before connecting.

2) Bi-direction operation

- Install the switches as shown in (Fig. 3) (Bi-direction?)
- The rotating direction cannot be reversed instantaneously. (SW1) must be turned off and the motor must be completely stopped before switching (SW2).

Switch number	Switch contact capacity
SW1	AC 125V or AC 250V more than 5A
SW2	AC 125V or AC 250V more than 5A

(2) Mounting procedure



- 1) Make rectangular holes in the combination panel.
- 2) Assemble the main body of the controller and the front cover so that the controller body fits in the rectangular holes of the panel. Use M4 bolts and nuts to fix

5. Mode Descriptions

(1) RATIO MODE

Ratio mode indicates the actual speed of gearhead output RPM and conveyor speed by multiplying rpm with magnification.

1) Gear Ratio (for indication conforming to gearhead output rpm)

⟨"SET" or "REAL" value = Motor rpm ÷ Gearratio⟩

Example) The Gear Ratio chart is listed. Select the required value with ↑, ↓ button 1.000 → 3 → ... → 100 → ... → 202 → ... → 1000 → ... → 2515 [Refer to P14. Gear ratio]

2) Multiple magnification value (for indication conforming to the transfer speed of conveyor belt)

⟨"SET" or "REAL" value = Motor rpm X Multiple magnification value⟩

Example) The Multiple magnifications are listed from 0.005 thru 0.995. Select the required value with ↑, ↓ button 1.000 → 0.995 → ... → 0.015 → 0.010 → 0.005 (0.005 per tick)

(2) SET MODE

Set mode is used to setup RPM using ↑, ↓ button

If the indicated magnification is 1.000

Term Value is 10 rpm

Example) • Frequency 50Hz : 90 → 100 → 110 → ... → 1400 → 1500rpm
 • Frequency 60Hz : 90 → 100 → 110 → ... → 1400 → ... → 1700 → 1800rpm

If the indicated magnification is not 1.000

Rpm can be set in connection with the Multiple Magnification value set on Ratio Mode.

Example) Gear ratio value = 3

Base Unit, 10 ÷ 3rpm. The value is rounded to nearest tenth.

- Frequency 50Hz : 29.9 → 33.3 → 36.6 → ... → 466.6 → 500.0rpm
- Frequency 60Hz : 29.9 → 33.3 → 36.6 → ... → 466.6 → ... → 566.6 → 600.0rpm

Example) Multiple magnifications value = 0.500

Base Unit, 10X0.500. The value is rounded to nearest tenth.

- Frequency 50Hz : 45.0 → 50.0 → 55.0 → ... → 700.0 → 750.0rpm
- Frequency 60Hz : 45.0 → 50.0 → 55.0 → ... → 700.0 → ... → 850.0 → 900.0rpm

(3) REAL MODE

Real mode indicates the actual speed of a motor by multiplying with magnification.

「If the indicated magnification is 1.000」

Term Value is 5 rpm

Example) 0 → 5 → 10 → ... → 90 → 95 → 100 → ... → 1400 → ... → 1700rpm

「If the indicated magnification is not 1.000」

Operate on "Ratio" Mode by follows magnification and Gear ratio value

Example) Gear ratio value = 3

Base Unit, 5 ÷ 3rpm. The value is rounded to nearest tenth.
 0 → 1.6 → ... → 29.9 → 31.6 → 33.3 → ... → 466.6 → ... → 566.6rpm

Example) Multiple magnification value=0.500

Base Unit, 5X0.500. The value is rounded to nearest tenth.

Example) 0 → 1.6 → ... → 29.9 → 31.6 → 33.3 → ... → 466.6 → ... → 566.6rpm

NOTE Nothing will be indicated if the magnification is under 1.000

(4) S/R MODE

S/R mode sets up the Slow Run time using ↑, ↓ button. 0.1 sec per tick, up to 30 seconds

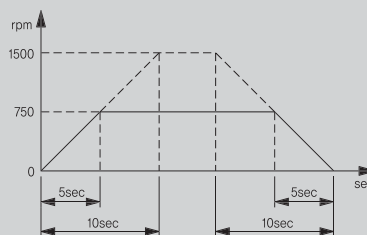
0 → 0.1 → ... → 0.2 → 0.3 → 0.4 → ... → 29.9 → 30.0sec.

(5) S/S MODE

S/S mode sets up the Slow Stop time using ↑, ↓ button. 0.1 sec per tick, up to 30 seconds

0 → 0.1 → ... → 0.2 → 0.3 → 0.4 → ... → 29.9 → 30.0sec.

NOTE 1. SLOW RUN · SLOW STOP time



Slow Run and Slow Stop time refers to time required to change rpm from 0 to 1500 and vice versa.

(ex) When Slow Run time is 10sec. And "Set" rpm is 750rpm

$$10s \times \frac{750rpm}{1500rpm} = 5s$$

It takes about 5sec from 0rpm to 750rpm. The same time will be required for Slow Stop.

NOTE 2. Slow Run and Slow Stop time can be longer if Inertia of load is bigger

(6) Power-On Status Setup Mode

Power-On Status Setup mode enables selections of operation when the power is supplied.

1) Indicating "YES"

When the power is resupplied, it recovers its previous operating conditions.

Previous condition	After the power is resupplied
"RUN"	Run(after 2Sec.)
"STOP"	Stop

2) Indicating "NO"

When the power is resupplied, it stops regardless of its previous condition

Previous condition	After the power is resupplied
"RUN"	Stop
"STOP"	Stop

6. Gear Ratio Char

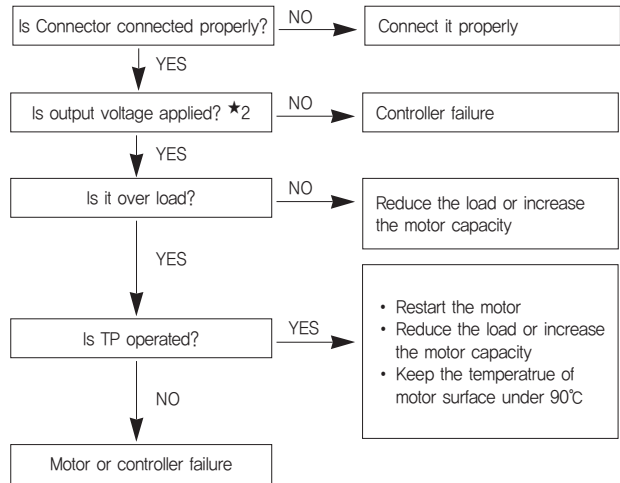
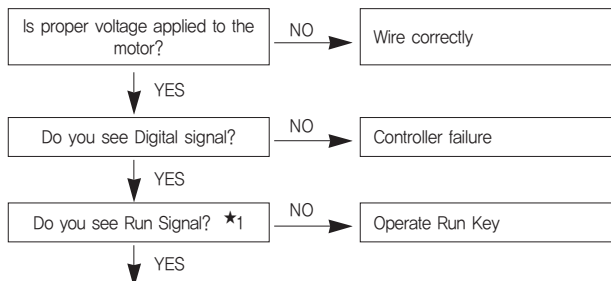
The gear ratio between actual and nominal can be different. Prefer to the chart in below

Nominal gear ratio	Actual gear ratio							Inter-decimal gear head
	60/6W	70/15W	80/15W	80/25W	90/40W	90/60W	90/90W	
3	3,00	3,00	3,00	3,00	3,00	3,00	3,00	10
3,6	3,60	3,59	3,57	3,57	3,60	3,60	3,60	
5	5,00	5,00	5,00	5,00	5,00	5,04	5,04	
6	6,00	6,00	6,00	6,00	6,03	6,00	6,00	
7,5	7,50	7,50	7,50	7,50	7,50	7,50	7,50	
9	9,00	9,00	9,00	9,00	9,00	9,00	9,00	
10	10,00	10,29	10,00	10,00	10,00	10,00	10,00	
12,5	12,50	12,14	12,50	12,50	12,50	12,50	12,50	
15	15,00	15,00	15,00	15,00	15,00	15,00	15,00	
18	18,00	17,92	18,08	18,08	17,67	18,00	18,00	
20	19,90	20,00	20,00	20,00	20,00	20,19	20,19	
25	25,06	24,80	25,00	25,00	24,73	25,00	25,00	
30	30,25	30,00	30,00	30,00	30,00	30,00	30,00	
36	36,30	36,00	36,00	36,00	36,00	36,00	36,00	
40	40,80	40,36	40,11	40,11	40,36	39,68	39,68	
50	50,00	50,00	50,00	50,00	50,00	50,00	50,00	
60	60,00	60,00	60,00	60,00	60,00	60,00	60,00	
75	75,00	75,00	75,00	75,00	75,00	76,02	76,02	
90	90,00	90,67	90,00	90,00	90,00	90,00	90,00	
100	100,0	100,0	100,0	100,0	100,0	100,0	100,0	
120	120,0	118,0	120,0	120,0	120,0	120,0	120,0	
150	150,0	154,0	150,0	150,0	150,0	149,9	149,9	
180	180,0	181,2	180,0	180,0	180,0	179,8	179,8	
200	198,9	194,8	200,0	200,0	201,8	197,2	197,2	
250	251,5	-	-	-	-	-	-	

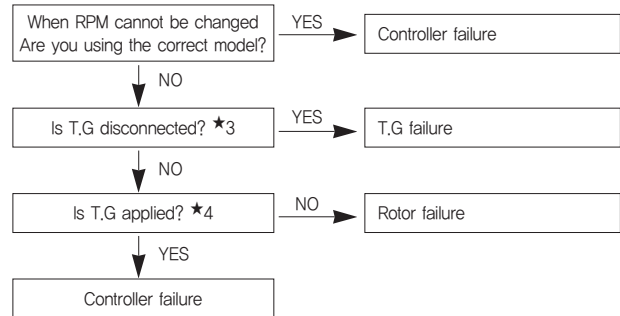
7. Trouble shooting

Whenever the trouble occurs, check the following table to see if it can be repaired on site. If the trouble remains unresolved after corresponding to the following steps, please contact the dealer or manufacturer.

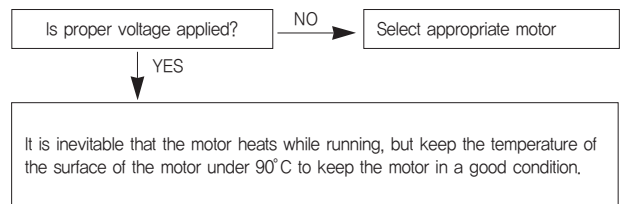
1. The motor does not rotate



2. When RPM cannot be changed



3. When abnormal temperature occurs during running



1. If "Run" and "Stop" signals are indicated simultaneously, it is caused either by a failure of the controller or as the operation limit of "Yes" mode has been reached. Use "No" mode instead.

2. Check the voltage : Check the motor voltage of black-white, black-gray during motor connector is plugged. (C.W black-white=100V) (CCW black-grey=100V) (Voltage doubles for 220V specifications)

3. Turn on Test
Disconnect the motor connector and check the resistance of red-red wire.

4. Check the voltage
Connect the motor connector and check the voltage of red-red wire.

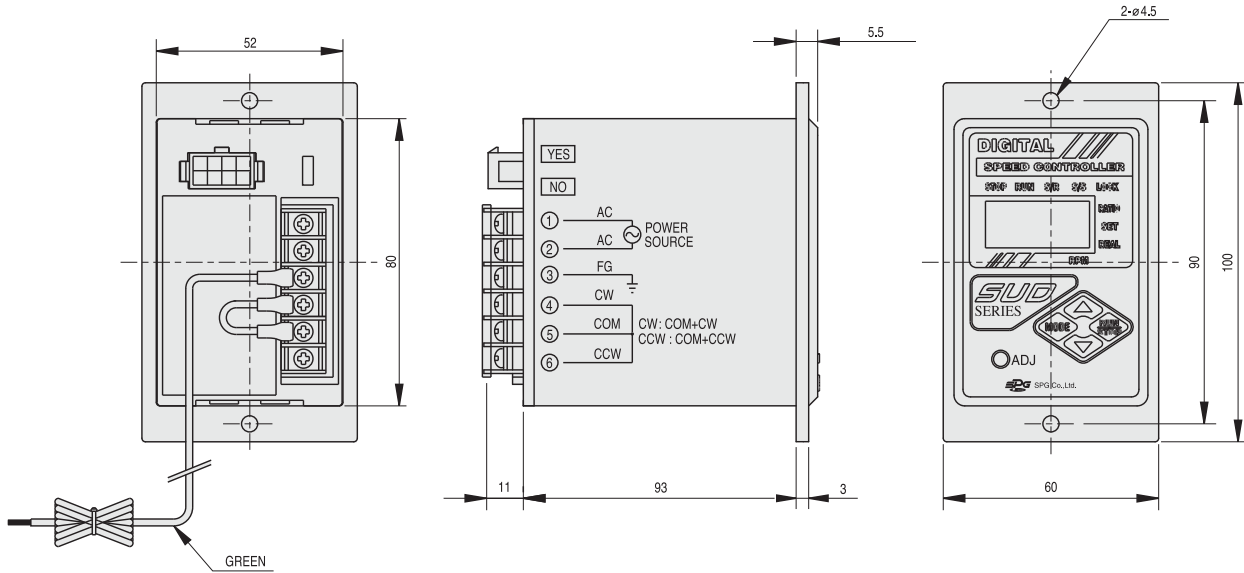
8. Specifications

MODEL	SUD□IA-V12	SUD□IB-V12	SUD□IC-V12	SUD□ID-V12	SUD□IX-V12
List					
Rated Voltage	1-phase 110V	1-phase 220V	1-phase 100V	1-phase 200V	1-phase 220~240V
Voltage range	±10%(Compared with arted Voltage)				
Frequency	60Hz	60Hz	50/60Hz	50/60Hz	50Hz
Speed control range	60Hz : 90~1700rpm 50Hz : 90~1400rpm				
Speed changing rate	5%(Standard)				
Set Speed	Digital setting				
Slow run/ Slow stop time	0.1~30sec.				
Temperature range	0~40℃				
Conservation temperature range	-10~60℃				
Humidity range	Less than 85%(There is not dewing)				

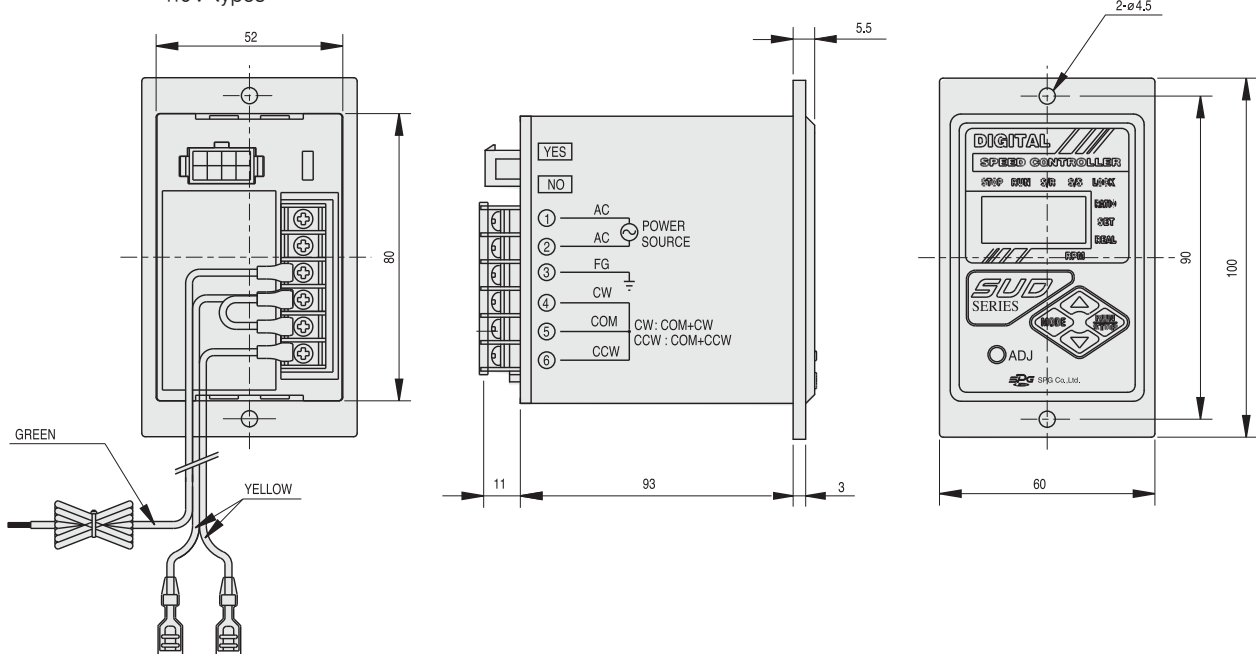
DIMENSIONS

+ SPEED CONTROLLER (SCALE = 1/2)

- **90W and below**(interior condenser)
→ Except over 60W 110V types



- **60W and over**(exterior condenser)
→ 110V types



UNIT TYPE SPEED CONTROL MOTOR

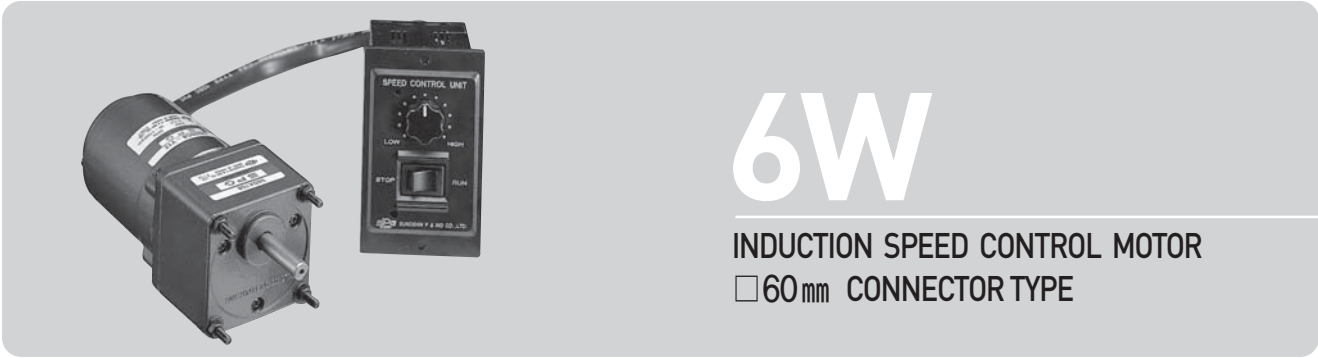


Characteristics of the unit type speed control motor

- This is a unit product that uses the separate unit type controller and motor simultaneously.
- The motor and the controller are connected with one touch.
AC power is connected and does not require a separate connection method. Speed can be controlled by a volume switch on the exterior. Therefore, it is appropriate for uses requiring remote control.
- The unit type controller has a speed controller circuit, a condenser for the motor and the volume.(By the size of the condenser, some units have to use the condenser on the outside.)
- The unit type controller does not have an instantaneous braking function.
- By using an extension cable(sold separately), it is possible to have a max distance of 2m between the motor and the controller.
- The control range is 90[rpm]~1400[rpm] for 50Hz and 90[rpm]~1700[rpm] for 60Hz.

GENERAL SPECIFICATIONS OF SPEED CONTROL MOTORS

ITEM	Specification
Insulation Resistance	100M Ω or more when 500V megger is applied between the windings and the housing after rated motor operation under normal ambient temperature and humidity
Dielectric Strength	Sufficient to withstand 1.5V at 50/60Hz applied between the windings and the case after rated motor operation under normal ambient temperature and humidity for 1min.
Temperature Rise	80°C or less increase measured by thermometer after rated operation, (45°C less than the motor with fan motors with fan)
Insulation Class	B Class (130°C)
Overheat Protection Device	Built-in thermal protector (automatic return type): Open 120°C \pm 5°C, Close 76°C \pm 15°C
Ambient Temperature	-10°C~40°C
Ambient Humidity	85% maximum(non condensing)



SIZE mm sq.	Motor Type	Controller Type	Poles	Output (W)	Voltage (V)	Freq. (Hz)	Duty	Speed Range (rpm)	Permissible Torque				Starting Torque		Cap. (μ F)
									at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
60	S6I06GA-V12 S6I06GA-V12CE	SUA06IA-V12	4	6	1 ϕ 110	60	Cont.	90-1700	0.55	0.055	0.40	0.040	0.52	0.052	2.5
	S6I06GB-V12 S6I06GB-V12CE	SUA06IB-V12	4	6	1 ϕ 220	60	Cont.	90-1700	0.55	0.055	0.40	0.040	0.52	0.052	0.7
	S6I06GC-V12 S6I06GC-V12CE	SUA06IC-V12	4	6	1 ϕ 100	50	Cont.	90-1400	0.48	0.048	0.30	0.030	0.40	0.040	2.5
	60					90-1700									
	S6I06GD-V12 S6I06GD-V12CE	SUA06ID-V12	4	6	1 ϕ 200	50	Cont.	90-1400	0.48	0.048	0.30	0.030	0.40	0.040	0.7
	60					90-1700									
	S6I06GX-V12 S6I06GX-V12CE	SUA06IX-V12	4	6	1 ϕ 220	50	Cont.	90-1400	0.35	0.035	0.22	0.022	0.35	0.035	0.7
	1 ϕ 240				0.45				0.045	0.22	0.022	0.42	0.042		

- ❖ CE marked at the end of motor model name indicates that it is impedance protected type which has received CE.
- ❖ "L" or "H" type does not apply to motors under 40W.

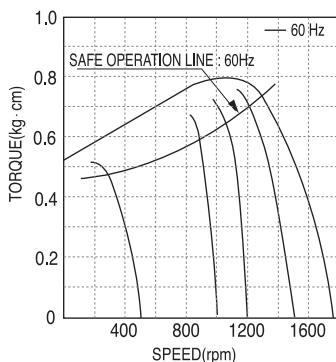
50Hz

MODEL	GEAR RATIO	rpm																								
		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250
S6DA□B	rpm	500	416	300	250	200	166	150	120	100	83	75	60	50	41	37	30	25	20	16	15	12	10	8	7.5	6
	kg-cm	1.3	1.5	2.1	2.6	3.2	3.9	4.3	5.4	6.4	7.7	7.7	9.7	11.6	13.9	15.5	17.5	21.0	26.2	30.0	30.0	30.0	30.0	30.0	30.0	30.0
	N·m	0.127	0.147	0.206	0.255	0.314	0.382	0.421	0.529	0.627	0.755	0.755	0.951	1.137	1.362	1.519	1.715	2.058	2.568	2.942	2.942	2.942	2.942	2.942	2.942	

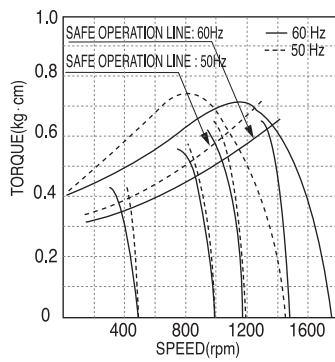
60Hz

MODEL	GEAR RATIO	rpm																								
		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200	250
S6DA□B	rpm	600	500	360	300	240	200	180	144	120	100	90	72	60	50	45	36	30	24	20	18	15	12	10	9	7.2
	kg-cm	1.0	1.3	1.7	2.1	2.6	3.1	3.5	4.4	5.2	6.3	6.3	7.8	9.4	11.3	12.6	14.2	17.0	21.3	25.5	28.4	30.0	30.0	30.0	30.0	30.0
	N·m	0.098	0.127	0.167	0.206	0.255	0.304	0.343	0.431	0.510	0.617	0.617	0.764	0.921	1.107	1.235	1.392	1.666	2.087	2.499	2.783	2.942	2.942	2.942	2.942	2.942

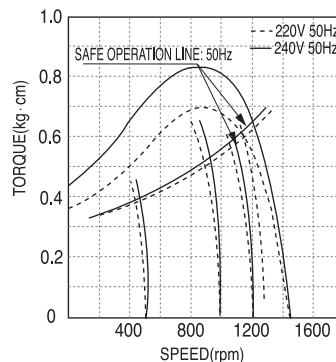
- ❖ The value in □ of gearhead model is for gear ratio.
- ❖ This is permissible torque of the assembled motor and gearhead.
- ❖ The permissible torque of the motor and inter-decimal gearhead is 30 kg-cm.
- ❖ ■ color indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. Others indicate rotation in the opposite direction.
- ❖ Rpm is based on synchronous speed (50Hz: 1500rpm, 60Hz: 1800rpm) divided by gear ratio. The actual rotation speed can be 2~20% less than displayed value depending on the load.
- ❖ "L" or "H" type does not apply to motors under 40W.



▲ S6I06GA-V12, S6I06GB-V12
S6I06GA-V12CE, S6I06GB-V12CE



▲ S6I06GC-V12, S6I06GD-V12
S6I06GC-V12CE, S6I06GD-V12CE

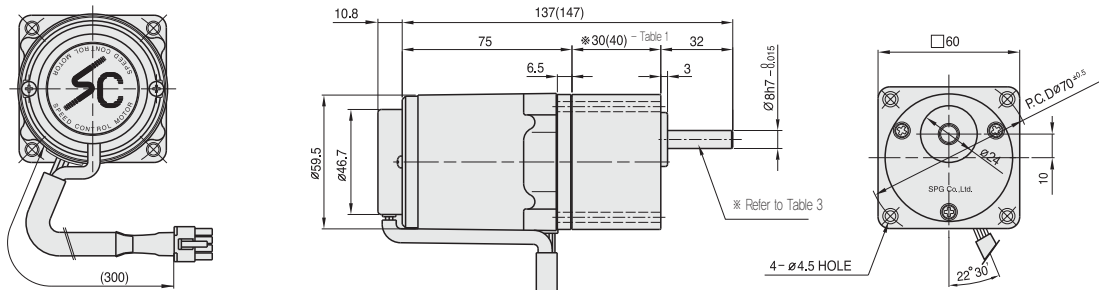


▲ S6I06GX-V12
S6I06GX-V12CE

DIMENSIONS

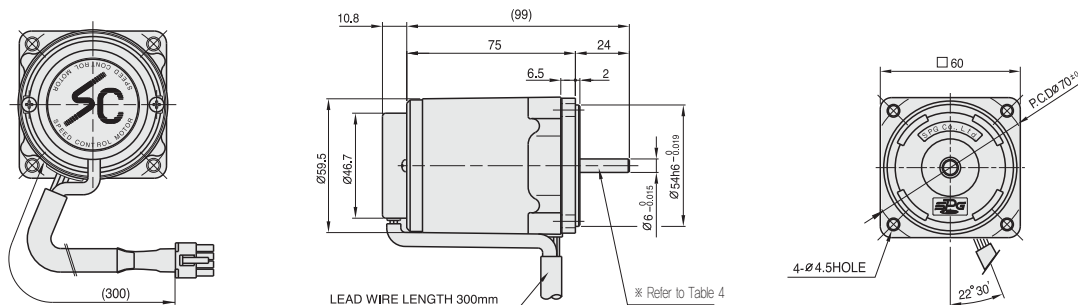
+ GEARED MOTOR

≒ MOTOR MODEL : S6I06G□-V12
 ≒ HEAD MODEL : S6□A3□-S6□A250□



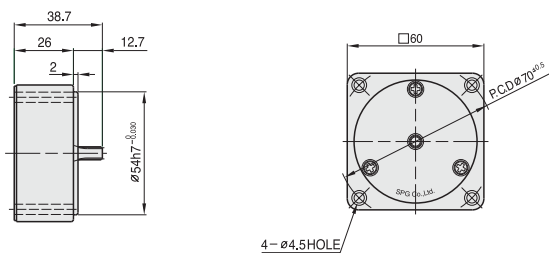
+ MOTOR

≒ MOTOR MODEL : S6I06□□-V12

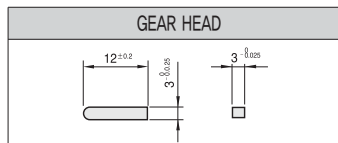


+ INTER-DECIMAL GEAR HEAD

≒ MODEL : S6GX10B



+ KEY SPEC



+ ≒26(35) - (Table1)

GEAR RATIO	SIZE(mm)
S6□A3□ ~ S6□A18□	30
S6□A20□ ~ S6□A250□	40

+ WEIGHT - (Table2)

PART	WEIGHT(kg)	
MOTOR	0.76	
DECIMAL GEAR HEAD	0.18	
GEAR HEAD	S6□A3□ ~ S6□A18□	0.24
	S6□A20□ ~ S6□A40□	0.30
	S6□A50□ ~ S6□A250□	0.33

+ SPEC for output shaft of gearhead - (Table3)

MODEL	TYPES OF OUTPUT SHAFT
S6SA3□ ~S6SA250□	STRAIGHT TYPE
	D-CUT TYPE
S6DA3□ ~S6DA250□	KEY TYPE
	S6KA3□ ~S6KA250□

+ SPEC for output shaft of motor - (Table4)

MODEL	TYPES OF OUTPUT SHAFT
S6I06G□-V12	GEAR TYPE
	STRAIGHT TYPE
S6I06S□-V12	D-CUT TYPE
	S6I06D□-V12



15W

INDUCTION SPEED CONTROL MOTOR

□ 70mm CONNECTOR TYPE

SIZE mm sq.	Motor Type	Controller Type	Poles	Output (W)	Voltage (V)	Freq. (Hz)	Duty	Speed Range (rpm)	Permissible Torque				Starting Torque		Cap. (μ F)
									at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
70	S7115GA-V12 S7115GA-V12(TP) S7115GA-V12CE	SUA715A-V12	4	15	1 ϕ 110	60	Cont.	90-1700	1.15	0.115	0.60	0.060	0.90	0.090	5.0
	S7115GB-V12 S7115GB-V12(TP) S7115GB-V12CE	SUA715B-V12	4	15	1 ϕ 220	60	Cont.	90-1700	1.15	0.115	0.60	0.060	0.90	0.090	1.2
	S7115GC-V12 S7115GC-V12(TP) S7115GC-V12CE	SUA715C-V12	4	15	1 ϕ 100	50	Cont.	90-1400	1.10	0.110	0.40	0.040	0.75	0.075	5.0
	60					90-1700		1.00	0.100						
	S7115GD-V12 S7115GD-V12(TP) S7115GD-V12CE	SUA715D-V12	4	15	1 ϕ 200	50	Cont.	90-1400	1.10	0.110	0.40	0.040	0.75	0.075	1.2
	60					90-1700		1.00	0.100						
	S7115GX-V12 S7115GX-V12CE	SUA715X-V12	4	15	1 ϕ 220	50	Cont.	90-1400	1.05	0.105	0.50	0.050	0.70	0.070	0.9
	1 ϕ 240				1.25				0.125	0.60					

- ◆ CE marked at the end of motor model name indicates that it is impedance protected type which has received CE.
- ◆ TP marked at the end of the motor model name indicates that it is standard motor with Thermal Protector mounted.
- ◆ S8115GX-V12, S8115GX-V12CE is thermally protected type with TP mounted.
- ◆ "L" or "H" type does not apply to motors under 40W.

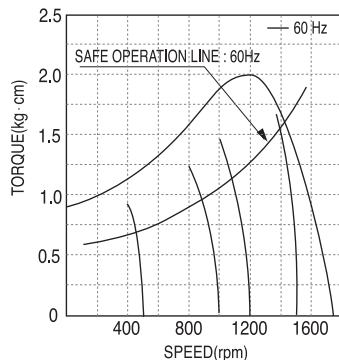
50Hz

GEAR RATIO		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
MODEL	rpm	500	416	300	250	200	166	150	120	100	83	75	60	50	41	37	30	25	20	16	15	12	10	8	7.5
	kg-cm	3.2	3.9	5.4	6.5	8.1	9.7	10.8	13.5	16.2	19.4	19.4	24.2	29.1	34.9	38.8	43.6	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
S7KA□B	N·m	0.314	0.382	0.530	0.637	0.794	0.951	1.059	1.324	1.587	1.902	1.902	2.373	2.854	3.423	3.805	4.276	4.900	4.900	4.900	4.900	4.900	4.900	4.900	4.900

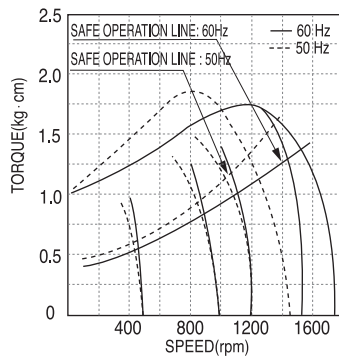
60Hz

GEAR RATIO		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
MODEL	rpm	600	500	360	300	240	200	180	144	120	100	90	72	60	50	45	36	30	24	20	18	15	12	10	9
	kg-cm	3.0	3.6	5.1	6.1	7.6	9.1	10.1	12.7	15.2	18.2	18.2	22.8	27.3	32.8	36.5	41.0	49.2	50.0	50.0	50.0	50.0	50.0	50.0	50.0
S7KA□B	N·m	0.294	0.353	0.500	0.598	0.745	0.892	0.990	1.245	1.491	1.785	1.785	2.236	2.677	3.217	3.579	4.021	4.825	4.900	4.900	4.900	4.900	4.900	4.900	4.900

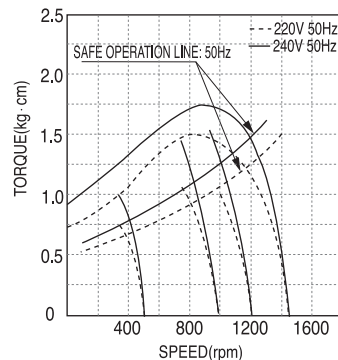
- ◆ The code in □ of gearhead model is for gear ratio.
- ◆ It is the permissible torque of the assembled motor and gearhead.
- ◆ The permissible torque of the motor and inter-decimal gearhead is 50 kg-cm.
- ◆ ■ color indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. Others indicate rotation in the opposite direction.
- ◆ Rpm is based on synchronous speed (50Hz: 1500rpm, 60Hz: 1800rpm) divided by gear ratio.
- ◆ The actual rotation speed can be 2~20% less than displayed value depending on the load.
- ◆ "L" or "H" type does not apply to motors under 40W.



▲ S7115GA-V12 S7115GB-V12
S7115GA-V12(TP) S7115GB-V12(TP)
S7115GA-V12CE S7115GB-V12CE



▲ S7115GC-V12 S7115GD-V12
S7115GC-V12(TP) S7115GD-V12(TP)
S7115GC-V12CE S7115GD-V12CE

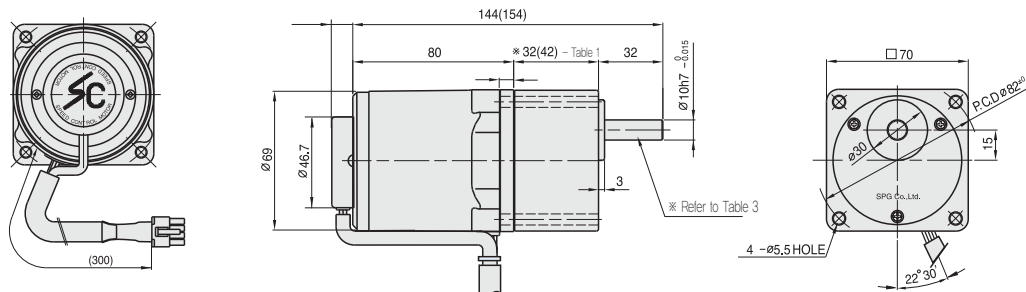


▲ S7115GX-V12
S7115GX-V12CE

DIMENSIONS

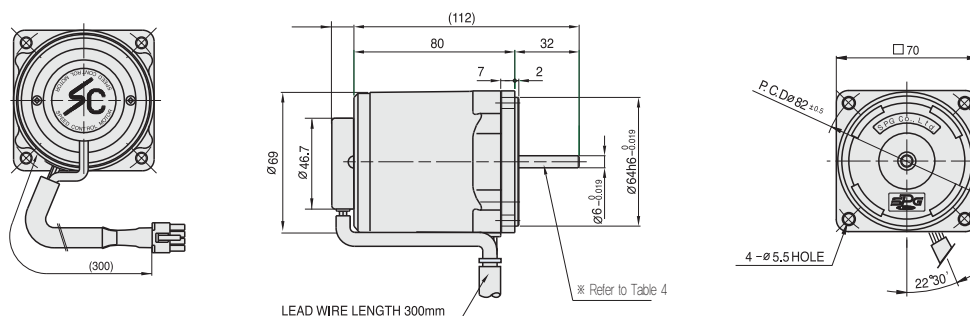
+ GEARED MOTOR

* MOTOR MODEL : S7115G□-V12
 * HEAD MODEL : S7□A3□~S7□A200□



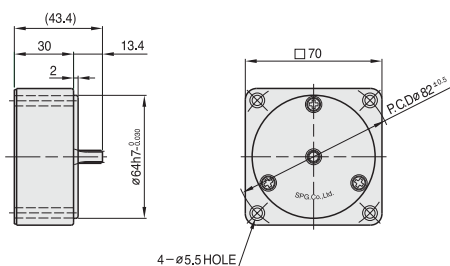
+ MOTOR

* MOTOR MODEL : S7115G□-V12

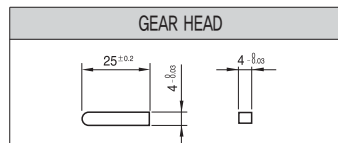


+ INTER-DECIMAL GEAR HEAD

* MODEL : S7GX10B



+ KEY SPEC



+ ※26(35) - (Table 1)

GEAR RATIO	SIZE(mm)
S7□A3□ ~ S7□A18□	32
S7□A20□ ~ S7□A200□	42

+ SPEC for output shaft of gearhead - (Table 3)

MODEL	TYPES OF OUTPUT SHAFT
S7SA3□ ~S7SA200□	STRAIGHT TYPE
	D-CUT TYPE
S7DA3□ ~S7DA200□	KEY TYPE

+ SPEC for output shaft of motor - (Table 4)

MODEL	TYPES OF OUTPUT SHAFT
S7115G□-V12	GEAR TYPE
	STRAIGHT TYPE
S7115D□-V12	D-CUT TYPE

+ WEIGHT - (Table 2)

PART	WEIGHT(kg)	
MOTOR	1.04	
DECIMAL GEAR HEAD	0.32	
GEAR HEAD	S7□A3□ ~ S7□A18□	0.38
	S7□A20□ ~ S7□A40□	0.47
	S7□A50□ ~ S7□A200□	0.52



15W

INDUCTION SPEED CONTROL MOTOR
 80mm CONNECTOR TYPE

SIZE mm sq.	Motor Type	Controller Type	Poles	Output (W)	Voltage (V)	Freq. (Hz)	Duty	Speed Range (rpm)	Permissible Torque				Starting Torque		Cap. (μ F)
									at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
									(kg-cm)	(N-m)	(kg-cm)	(N-m)			
80	S8I15GA-V12 S8I15GA-V12(TP) S8I15GA-V12CE	SUA15A-V12	4	15	1 ϕ 110	60	Cont.	90-1700	1.50	0.150	0.35	0.035	0.75	0.075	4.0
	S8I15GB-V12 S8I15GB-V12(TP) S8I15GB-V12CE	SUA15B-V12	4	15	1 ϕ 220	60	Cont.	90-1700	1.50	0.150	0.35	0.035	0.75	0.075	1.0
	S8I15GC-V12 S8I15GC-V12(TP) S8I15GC-V12CE	SUA15C-V12	4	15	1 ϕ 100	50	Cont.	90-1400	1.20	0.120	0.32	0.032	0.60	0.060	4.0
	60					90-1700		1.00	0.100						
	S8I15GD-V12 S8I15GD-V12(TP) S8I15GD-V12CE	SUA15D-V12	4	15	1 ϕ 200	50	Cont.	90-1400	1.20	0.120	0.32	0.032	0.60	0.060	1.0
	60					90-1700		1.00	0.100						
	S8I15GX-V12 S8I15GX-V12CE	SUA15X-V12	4	15	1 ϕ 220	50	Cont.	90-1400	1.20	0.120	0.35	0.035	0.55	0.055	1.0
	1 ϕ 240				1.40				0.140	0.35					

- ❖ CE marked at the end of motor model name indicates that it is impedance protected type which has received CE.
- ❖ TP marked at the end of the motor model name indicates that it is standard motor with Thermal Protector mounted.
- ❖ S8I15GX-V12, S8I15GX-V12CE is thermally protected type with TP mounted.
- ❖ "L" or "H" type does not apply to motors under 40W.

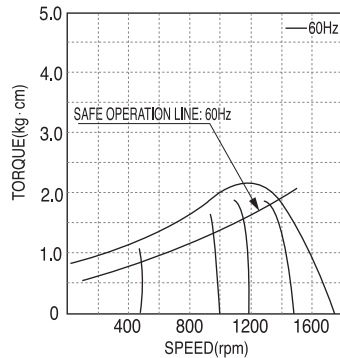
50Hz

GEAR RATIO		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
MODEL	rpm	500	416	300	250	200	166	150	120	100	83	75	60	50	41	37	30	25	20	16	15	12	10	8	7.5
	kg-cm	3.4	4.1	5.7	6.8	8.5	10.2	11.3	14.2	17.0	20.4	20.4	25.6	30.7	36.8	40.9	46.2	55.4	69.2	80	80	80	80	80	80
S8KA□B		N·m	0.333	0.402	0.559	0.666	0.833	1.000	1.107	1.392	1.666	1.999	1.999	2.509	3.009	3.606	4.008	4.530	5.433	6.786	7.840	7.840	7.840	7.840	7.840

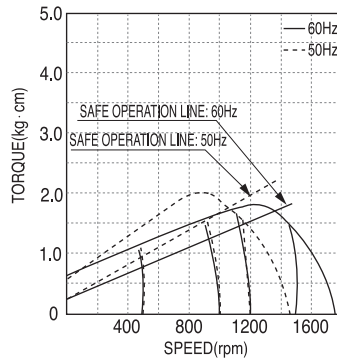
60Hz

GEAR RATIO		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
MODEL	rpm	600	500	360	300	240	200	180	144	120	100	90	72	60	50	45	36	30	24	20	18	15	12	10	9
	kg-cm	2.9	3.5	4.9	5.8	7.3	8.7	9.7	12.2	14.6	17.5	17.5	21.9	26.3	31.5	35.0	39.6	47.5	59.4	71.3	79.2	80	80	80	80
S8KA□B		N·m	0.284	0.343	0.481	0.568	0.715	0.853	0.951	1.196	1.432	1.715	1.715	2.146	2.577	3.087	3.430	3.881	4.658	5.825	6.992	7.767	7.840	7.840	7.840

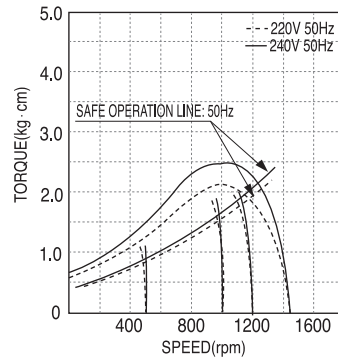
- ❖ The code in □ of gearhead model is for gear ratio.
- ❖ It is the permissible torque of the assembled motor and gearhead.
- ❖ The permissible torque of the motor and inter-decimal gearhead is 80 kg-cm.
- ❖ ■ color indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. Others indicate rotation in the opposite direction.
- ❖ Rpm is based on synchronous speed (50Hz: 1500rpm, 60Hz: 1800rpm) divided by gear ratio.
- ❖ The actual rotation speed can be 2~20% less than displayed value depending on the load.
- ❖ "L" or "H" type does not apply to motors under 40W.



▲ S8I15GA-V12 S8I15GB-V12
 S8I15GA-V12(TP) S8I15GB-V12(TP)
 S8I15GA-V12CE S8I15GB-V12CE



▲ S8I15GC-V12 S8I15GD-V12
 S8I15GC-V12(TP) S8I15GD-V12(TP)
 S8I15GC-V12CE S8I15GD-V12CE



▲ S8I15GX-V12
 S8I15GX-V12CE



25W

INDUCTION SPEED CONTROL MOTOR

□ 80mm CONNECTOR TYPE

SIZE mm sq.	Motor Type	Controller Type	Poles	Output (W)	Voltage (V)	Freq. (Hz)	Duty	Speed Range (rpm)	Permissible Torque				Starting Torque		Cap. (μ F)
									at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
									(kg-cm)	(N-m)	(kg-cm)	(N-m)			
80	S8I25GA-V12 S8I25GA-V12(TP) S8I25GA-V12CE	SUA25IA-V12	4	25	1 ϕ 110	60	Cont.	90-1700	1.70	0.170	0.08	0.080	1.50	0.150	6.0
	S8I25GB-V12 S8I25GB-V12(TP) S8I25GB-V12CE	SUA25IB-V12	4	25	1 ϕ 220	60	Cont.	90-1700	1.70	0.170	0.08	0.080	1.50	0.150	1.5
	S8I25GC-V12 S8I25GC-V12(TP) S8I25GC-V12CE	SUA25IC-V12	4	25	1 ϕ 100	50	Cont.	90-1400	1.60	0.160	0.55	0.055	1.10	0.110	6.0
	60					90-1700		1.50	0.150						
	S8I25GD-V12 S8I25GD-V12(TP) S8I25GD-V12CE	SUA25ID-V12	4	25	1 ϕ 200	50	Cont.	90-1400	1.60	0.160	0.55	0.055	1.10	0.110	1.5
	60					90-1700		1.50	0.150						
S8I25GX-V12 S8I25GX-V12CE	SUA25IX-V12	4	25	1 ϕ 220	50	Cont.	90-1400	1.50	0.150	0.50	0.050	1.00	0.100	1.5	
1 ϕ 240				1.80				0.180	0.50	0.050	1.20	0.120			

❖ CE marked at the end of motor model name indicates that it is impedance protected type which has received CE.

❖ TP marked at the end of the motor model name indicates that it is standard motor with Thermal Protector mounted.

❖ S8I25GX-V12, S8I25GX-V12CE is thermally protected type with TP mounted.

❖ "L" or "H" type does not apply to motors under 40W.

50Hz

MODEL	GEAR RATIO																								
	rpm	3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
	kg-cm	5.3	6.4	8.9	10.7	13.4	16.0	17.8	22.3	26.7	32.1	32.1	40.2	48.2	57.8	64.2	72.6	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
S8KA□B	N-m	0.519	0.627	0.872	1.049	1.313	1.568	1.744	2.185	2.617	3.146	3.146	3.940	4.724	5.664	6.292	7.115	7.840	7.840	7.840	7.840	7.840	7.840	7.840	7.840

60Hz

MODEL	GEAR RATIO																								
	rpm	3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
	kg-cm	4.4	5.2	7.3	8.7	10.9	13.1	14.6	18.2	21.9	26.2	26.3	32.9	39.4	47.3	52.6	59.4	71.3	80.0	80.0	80.0	80.0	80.0	80.0	80.0
S8KA□B	N-m	0.431	0.510	0.715	0.853	1.068	1.284	1.431	1.784	2.146	2.568	2.577	3.224	3.861	4.635	5.155	5.821	6.987	7.840	7.840	7.840	7.840	7.840	7.840	7.840

❖ The code in □ of gearhead model is for gear ratio.

❖ It is the permissible torque of the assembled motor and gearhead.

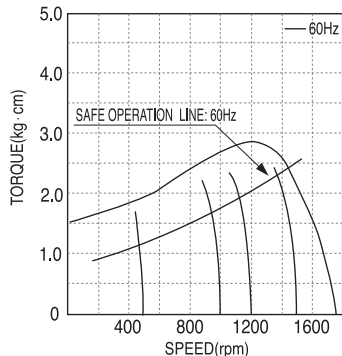
❖ The permissible torque of the motor and inter-decimal gearhead is 80 kg-cm.

❖ ■ color indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. Others indicate rotation in the opposite direction.

❖ Rpm is based on synchronous speed (50Hz: 1500rpm, 60Hz: 1800rpm) divided by gear ratio.

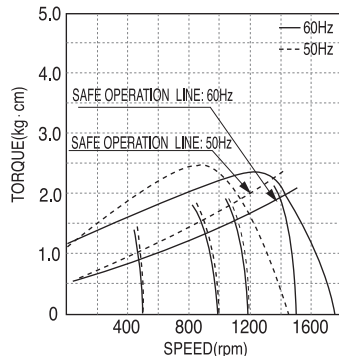
The actual rotation speed can be 2~20% less than displayed value depending on the load.

❖ "L" or "H" type does not apply to motors under 40W.



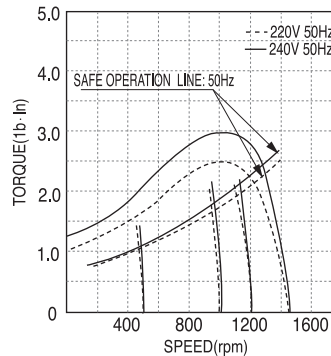
▲ S8I25GA-V12
S8I25GA-V12(TP)
S8I25GA-V12CE

▲ S8I25GB-V12
S8I25GB-V12(TP)
S8I25GB-V12CE



▲ S8I25GC-V12
S8I25GC-V12(TP)
S8I25GC-V12CE

▲ S8I25GD-V12
S8I25GD-V12(TP)
S8I25GD-V12CE

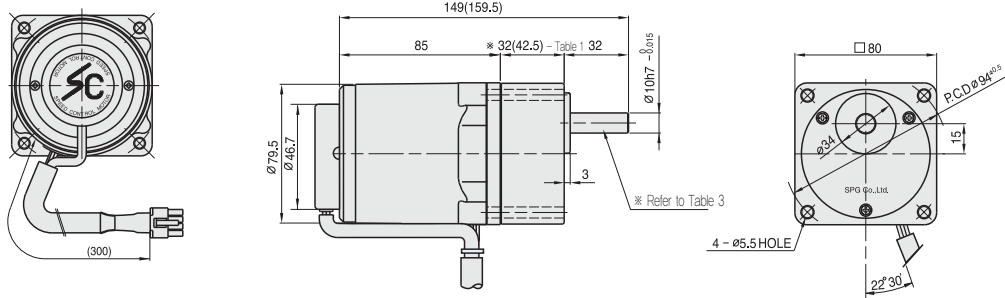


▲ S8I25GX-V12
S8I25GX-V12CE

DIMENSIONS

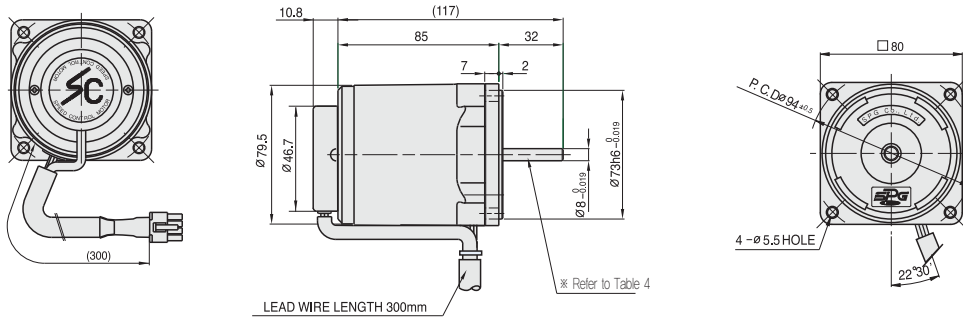
+ GEARED MOTOR

※ MOTOR MODEL : S8(15,25)G□-V12
 ※ HEAD MODEL : S8□A3□~S8□A20□



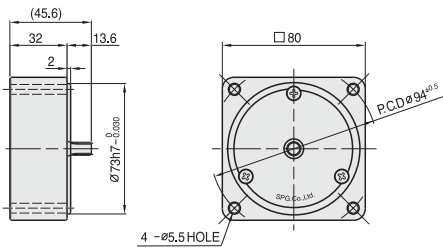
+ MOTOR

※ MOTOR MODEL : S8I(15,25)□□-V12



+ INTER-DECIMAL GEAR HEAD

※ MODEL : S8GX10B



+ KEY SPEC

GEAR HEAD		MOTOR	
	25 ^{+0.2}		25 ^{+0.2}
	4.3 ^{±0.05}		3.1 ^{±0.05}
	4.3 ^{±0.05}		3.1 ^{±0.05}

+ SPEC for output shaft of motor - (Table 4)

MODEL	TYPES OF OUTPUT SHAFT
GEAR TYPE	
S8I15G□-V12 S8I25G□-V12	
STRAIGHT TYPE	
S8I15S□-V12 S8I25S□-V12	
D-CUT TYPE	
S8I15D□-V12 S8I25D□-V12	
KEY TYPE	
S8I15K□-V12 S8I25K□-V12	

+ ※26(35) - (Table 1)

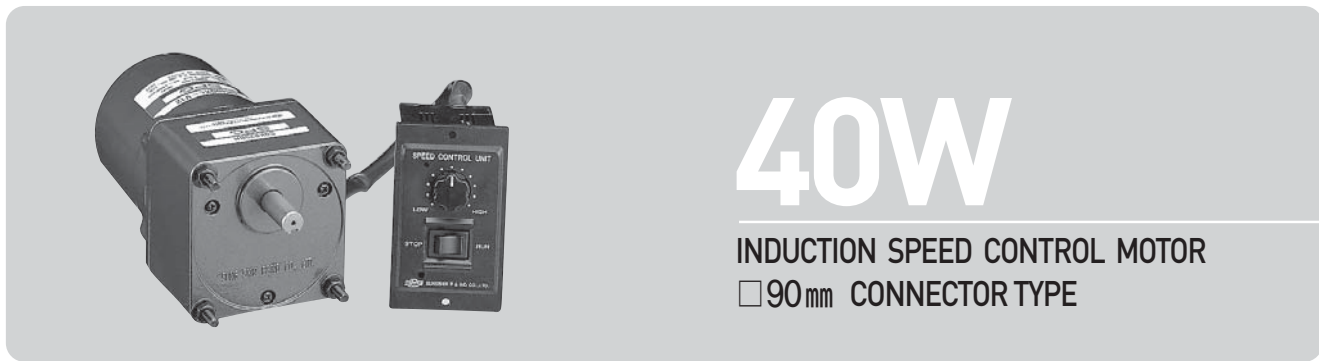
GEAR RATIO	SIZE(mm)
S8□A3□ ~ S8□A18□	32
S8□A20□ ~ S8□A200□	42.5

+ WEIGHT - (Table 2)

PART	WEIGHT(kg)	
15W MOTOR	1.6	
25W MOTOR	1.6	
DECIMAL GEAR HEAD	0.43	
GEAR HEAD	S8□A3□ ~S8□A18□	0.43
	S8□A20□ ~S8□A40□	0.57
	S8□A50□ ~S8□A200□	0.61

+ SPEC for output shaft of gearhead - (Table 3)

MODEL	TYPES OF OUTPUT SHAFT
STRAIGHT TYPE	
S8SA3□ ~S8SA200□	
D-CUT TYPE	
S8DA3□ ~S8DA200□	
KEY TYPE	
S8KA3□ ~S8KA200□	



SIZE mm sq.	Motor Type	Controller Type	Poles	Output (W)	Voltage (V)	Freq. (Hz)	Duty	Speed Range (rpm)	Permissible Torque				Starting Torque		Cap. (μ F)
									at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
90	S9I40GA()-V12 S9I40GA()-V12(TP) S9I40GA()-V12CE	SUA40IA-V12	4	40	1 ϕ 110	60	Cont.	90-1700	2.70	0.270	1.00	0.100	2.20	0.220	10.0
	S9I40GB()-V12 S9I40GB()-V12(TP) S9I40GB()-V12CE	SUA40IB-V12	4	40	1 ϕ 220	60	Cont.	90-1700	2.70	0.270	1.00	0.100	2.20	0.220	2.5
	S9I40GC()-V12 S9I40GC()-V12(TP) S9I40GC()-V12CE	SUA40IC-V12	4	40	1 ϕ 100	50 60	Cont.	90-1400 90-1700	2.70 2.00	0.270 0.200	0.90	0.090	1.80	0.180	10.0
	S9I40GD()-V12 S9I40GD()-V12(TP) S9I40GD()-V12CE	SUA40ID-V12	4	40	1 ϕ 200	50 60	Cont.	90-1400 90-1700	2.70 2.00	0.270 0.200	0.90	0.090	1.80	0.180	2.5
	S9I40GX()-V12 S9I40GX()-V12CE	SUA40IX-V12	4	40	1 ϕ 220 1 ϕ 240	50	Cont.	90-1400	2.50 3.00	0.250 0.300	0.70 0.70	0.070 0.070	1.70 2.10	0.170 0.210	2.0

- ❖ CE marked at the end of motor model name indicates that it is impedance protected type which has received CE.
- ❖ TP marked at the end of the motor model name indicates that it is standard motor with Thermal Protector mounted.
- ❖ S9I40GX()-V12, S9I40GX()-V12CE is thermally protected type with TP mounted.
- ❖ () is for marking 'L' type or 'H'. 'L' should be used with gearhead 'L' and 'H' should be used with gearhead 'H'.

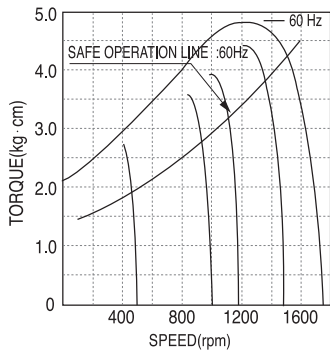
50Hz

GEAR RATIO	3 3.6 5 6 7.5 9 10 12.5 15 18 20 25 30 36 40 50 60 75 90 100 120 150 180 200																										
	MODEL	rpm	500	416	300	250	200	166	150	120	100	83	75	60	50	41	37	30	25	20	16	15	12	10	8	7.5	
S9KB□()	kg-cm	8.3	9.9	13.8	16.5	20.7	24.8	27.5	34.4	41.3	49.6	49.6	62.1	74.5	89.4	99.3	100	100	100	100	100	100	100	100	100	100	100
	N·m	0.813	0.970	1.352	1.617	2.029	2.430	2.695	3.371	4.047	4.861	4.861	6.086	7.301	8.761	9.731	9.800	9.800	9.800	9.800	9.800	9.800	9.800	9.800	9.800	9.800	9.800

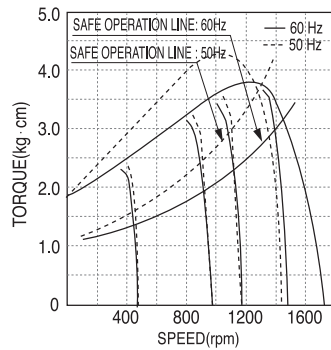
60Hz

GEAR RATIO	3 3.6 5 6 7.5 9 10 12.5 15 18 20 25 30 36 40 50 60 75 90 100 120 150 180 200																										
	MODEL	rpm	600	500	360	300	240	200	180	144	120	100	90	72	60	50	45	36	30	24	20	18	15	12	10	9	
S9KB□()	kg-cm	6.8	8.2	11.3	13.6	17.0	20.4	22.7	28.4	34.0	40.8	40.9	51.1	61.3	73.6	81.8	100	100	100	100	100	100	100	100	100	100	100
	N·m	0.666	0.804	1.107	1.333	1.666	1.999	2.225	2.783	3.332	3.998	4.008	5.008	6.007	7.213	8.016	9.800	9.800	9.800	9.800	9.800	9.800	9.800	9.800	9.800	9.800	9.800

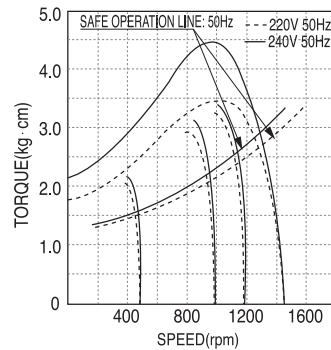
- ❖ The code in □ of gearhead model is for gear ratio.
- ❖ It is the permissible torque of the assembled motor and gearhead.
- ❖ The permissible torque of the motor and inter-decimal gearhead is 100 kg-cm.
- ❖ ■ color indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. Others indicate rotation in the opposite direction.
- ❖ Rpm is based on synchronous speed (50Hz: 1500rpm, 60Hz: 1800rpm) divided by gear ratio.
- ❖ The actual rotation speed can be 2~20% less than displayed value depending on the load.
- ❖ () is for marking 'L' type or 'H'. 'L' should be used with motor 'L' and 'H' should be used with motor 'H'.



▲ S9I40GA()-V12 S9I40GB()-V12
S9I40GA()-V12(TP) S9I40GB()-V12(TP)
S9I40GA()-V12CE S9I40GB()-V12CE



▲ S9I40GC()-V12 S9I40GD()-V12
S9I40GC()-V12(TP) S9I40GD()-V12(TP)
S9I40GC()-V12CE S9I40GD()-V12CE

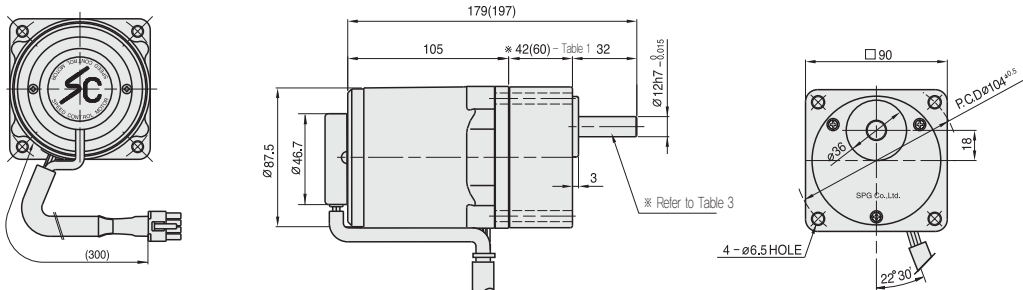


▲ S9I40GX()-V12
S9I40GX()-V12CE

DIMENSIONS

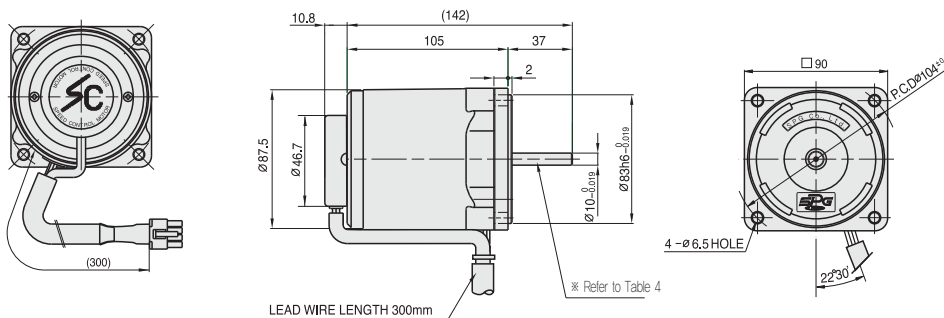
+ GEARED MOTOR

* MOTOR MODEL : S8(15,25)G□-V12
 * HEAD MODEL : S8□A3□~S8□A200□



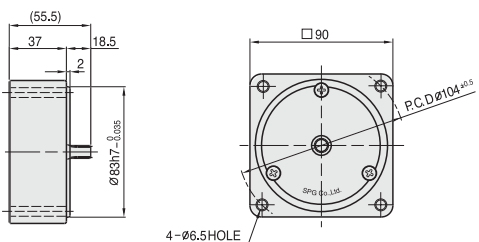
+ MOTOR

* MOTOR MODEL : S8I(15,25)□□-V12



+ INTER-DECIMAL GEAR HEAD

* MODEL : S8GX10B



+ KEY SPEC

GEAR HEAD	MOTOR

+ SPEC for output shaft of motor - (Table 4)

MODEL	TYPES OF OUTPUT SHAFT
GEAR TYPE	
S9I40G□□-V12	
STRAIGHT TYPE	
S9I40S□□-V12	
D-CUT TYPE	
S9I40D□□-V12	
KEY TYPE	
S9I40K□□-V12	

+ *26(35) - (Table 1)

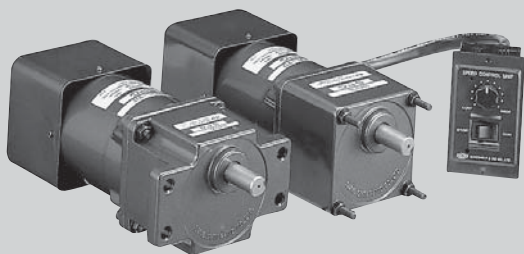
GEAR RATIO	SIZE(mm)
S9□B3□ ~ S9□B18□	42
S9□B20□ ~ S9□B200□	60

+ WEIGHT - (Table 2)

PART	WEIGHT(kg)	
MOTOR	2.42	
DECIMAL GEAR HEAD	0.60	
GEAR HEAD	S9□B3□ ~ S9□B18□	0.73
	S9□B20□ ~ S9□B40□	1.03
	S9□B50□ ~ S9□B200□	1.13

+ SPEC for output shaft of gearhead - (Table 3)

MODEL	TYPES OF OUTPUT SHAFT
STRAIGHT TYPE	
S9SB3□ ~ S9SB200□	
D-CUT TYPE	
S9DB3□ ~ S9DB200□	
KEY TYPE	
S9KB3□ ~ S9KB200□	



60W

INDUCTION SPEED CONTROL MOTOR

□ 90mm CONNECTOR TYPE

SIZE mm sq.	Motor Type	Controller Type	Poles	Output (W)	Voltage (V)	Freq. (Hz)	Duty	Speed Range (rpm)	Permissible Torque				Starting Torque		Cap. (μ F)
									at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
90	S9I60GA()-V12 S9I60GA()-V12(TP) S9I60GA()-V12CE	SUA60IA-V12	4	60	1 ϕ 110	60	Cont.	90-1700	5.50	0.550	2.00	0.200	5.00	0.500	20.0
	S9I60GB()-V12 S9I60GB()-V12(TP) S9I60GB()-V12CE	SUA60IB-V12	4	60	1 ϕ 220	60	Cont.	90-1700	5.50	0.550	2.00	0.200	5.00	0.500	5.0
	S9I60GC()-V12 S9I60GC()-V12(TP) S9I60GC()-V12CE	SUA60IC-V12	4	60	1 ϕ 100	50 60	Cont.	90-1400 90-1700	5.50 5.00	0.550 0.500	1.20	0.120	4.00	0.400	20.0
	S9I60GD()-V12 S9I60GD()-V12(TP) S9I60GD()-V12CE	SUA60ID-V12	4	60	1 ϕ 200	50 60	Cont.	90-1400 90-1700	5.50 5.00	0.550 0.500	1.20	0.120	4.00	0.400	5.0
	S9I60GX()-V12 S9I60GX()-V12CE	SUA60IX-V12	4	60	1 ϕ 220 1 ϕ 240	50	Cont.	90-1400	5.20 5.80	0.520 0.580	0.90	0.090	3.10	0.310	3.5

- ❖ CE marked at the end of motor model name indicates that it is impedance protected type which has received CE.
- ❖ TP marked at the end of the motor model name indicates that it is standard motor with Thermal Protector mounted.
- ❖ S9I60GX()-V12, S9I60GX()-V12CE is thermally protected type with TP mounted.
- ❖ () is for marking 'L' type or 'H'. 'L' should be used with gearhead 'L' and 'H' should be used with gearhead 'H'.

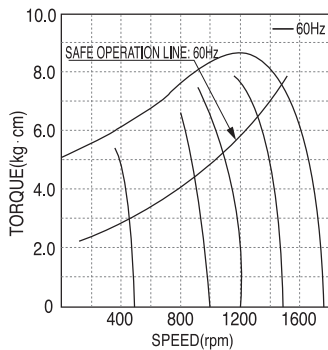
50Hz

GEAR RATIO	3 3.6 5 6 7.5 9 10 12.5 15 18 20 25 30 36 40 50 60 75 90 100 120 150 180 200																										
	MODEL	rpm	500	416	300	250	200	166	150	120	100	83	75	60	50	41	37	30	25	20	16	15	12	10	8	7.5	
S9KC□()	kg-cm	12.2	14.6	20.3	24.3	30.4	36.5	40.5	45.6	54.8	65.7	73.0	82.5	99.0	119	132	165	198	200	200	200	200	200	200	200	200	200
S9KC□()-S	N·m	1.196	1.431	1.989	2.381	2.989	3.577	3.969	4.469	5.370	6.439	7.154	8.085	9.702	11.66	12.94	16.17	19.40	19.60	19.60	19.60	19.60	19.60	19.60	19.60	19.60	19.60

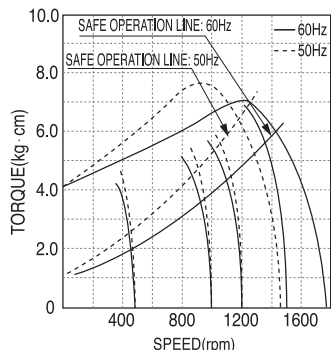
60Hz

GEAR RATIO	3 3.6 5 6 7.5 9 10 12.5 15 18 20 25 30 36 40 50 60 75 90 100 120 150 180 200																									
	MODEL	rpm	600	500	360	300	240	200	180	144	120	100	90	72	60	50	45	36	30	24	20	18	15	12	10	9
S9KC□()	kg-cm	9.72	11.7	16.2	19.4	24.3	29.2	32.4	36.5	43.8	52.6	58.4	66.0	79.2	95.0	106	132	158	177	200	200	200	200	200	200	200
S9KC□()-S	N·m	0.953	1.147	1.588	1.901	2.381	2.862	3.175	3.577	4.292	5.155	5.723	6.468	7.762	9.310	10.39	12.94	15.48	17.35	19.60	19.60	19.60	19.60	19.60	19.60	19.60

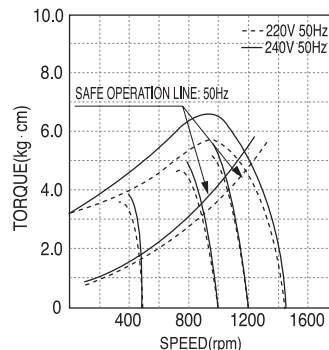
- ❖ The code in □ of gearhead model is for gear ratio.
- ❖ It is the permissible torque of the assembled motor and gearhead.
- ❖ The permissible torque of the motor and inter-decimal gearhead is 200 kg-cm.
- ❖ ■ color indicates that the output shaft of the geared motor rotates in the same direction as the output shaft of the motor. Others indicate rotation in the opposite direction.
- ❖ Rpm is based on synchronous speed (50Hz: 1500rpm, 60Hz: 1800rpm) divided by gear ratio.
- ❖ The actual rotation speed can be 2~20% less than displayed value depending on the load.
- ❖ () is for marking 'L' type or 'H'. 'L' should be used with motor 'L' and 'H' should be used with motor 'H'.



▲ S9I60GA()-V12 S9I60GB()-V12
S9I60GA()-V12(TP) S9I60GB()-V12(TP)
S9I60GA()-V12CE S9I60GB()-V12CE



▲ S9I60GC()-V12 S9I60GD()-V12
S9I60GC()-V12(TP) S9I60GD()-V12(TP)
S9I60GC()-V12CE S9I60GD()-V12CE

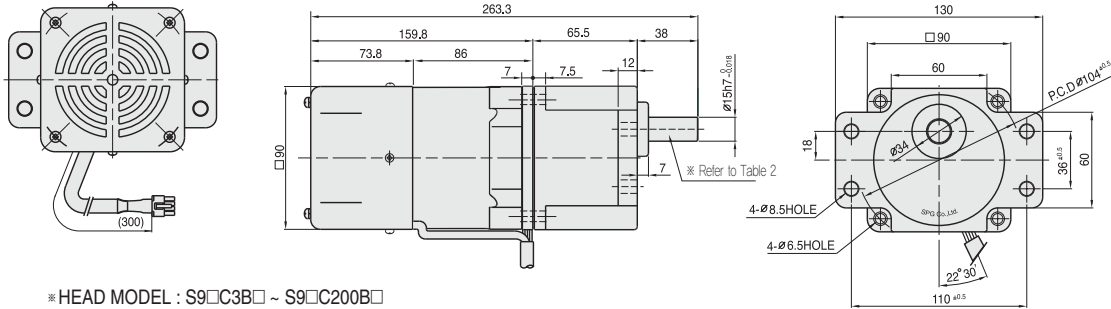


▲ S9I60GX()-V12
S9I60GX()-V12CE

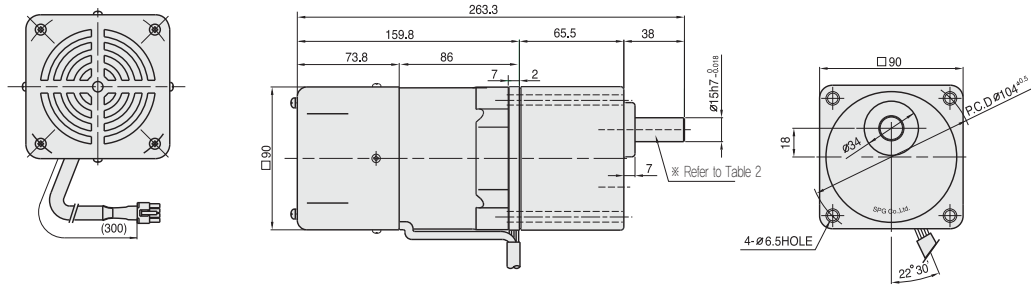
DIMENSIONS

+ GEARED MOTOR

* MOTOR MODEL : S9I60G□□-V12
 * HEAD MODEL : S9□C3B□ ~ S9□C200□-S

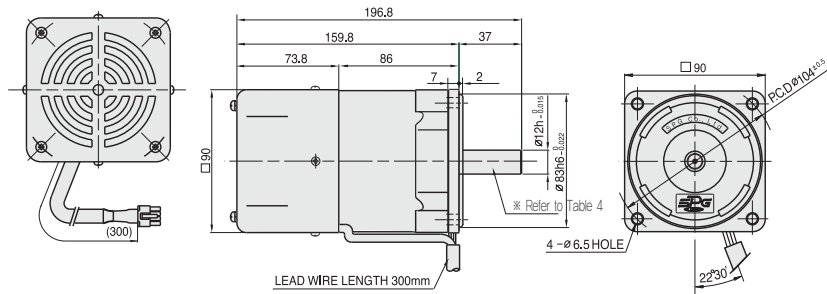


* HEAD MODEL : S9□C3B□ ~ S9□C200B□



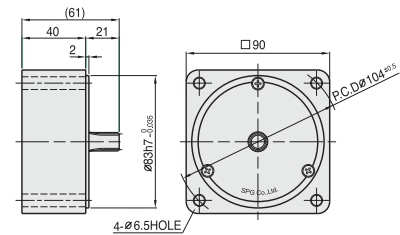
+ MOTOR

* MOTOR MODEL : S9I60□□□-V12



+ INTER-DECIMAL GEAR HEAD

* MODEL : S9GX10B(H,L)-S



+ WEIGHT - (Table1)

PART	WEIGHT(kg)	
MOTOR	2.93	
DECIMAL GEAR HEAD	0.65	
GEAR HEAD	S9□C3B□ ~S9□C10B□	1.21
	S9□C12.5B□ ~S9□C20B□	1.30
	S9□C25B□ ~S9□C60B□	1.40
	S9□C75B□ ~S9□C200B□	1.45

+ SPEC for output shaft of gearhead - (Table2)

MODEL	TYPES OF OUTPUT SHAFT
STRAIGHT TYPE	
S9SC3B□ ~S9SC200B□	
D-CUT TYPE	
S9DC3B□ ~S9DC200B□	
KEY TYPE	
S9KC3B□ ~S9KC200B□	

+ SPEC for output shaft of motor - (Table3)

MODEL	TYPES OF OUTPUT SHAFT
GEAR TYPE	
S9I60G□□-V12	
STRAIGHT TYPE	
S9I60S□-V12	
D-CUT TYPE	
S9I60D□-V12	
KEY TYPE	
S9I60K□-V12	

+ KEY SPEC

