

SUD series

DIGITAL TYPE SPEED CONTROLLER

MOTOR

■ SPG MOTOR의 제품을 구입해 주셔서 감사합니다.

사용전에 반드시 사용설명서를 숙독하여, 제품에 대한 지식 및 안전에 관한 정보 그리고 주의 사항 등 모든것에 대해 충분히 숙지한 후 사용해 주십시오. 읽고 난 후에, 언제라도 사용할수 있도록 일정한 장소에 보관해 주십시오.

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1. 안전상의 유의점

이 사용설명서에는, 안전주의사항 등급을 「경고」, 「주의」로 구분하고 있습니다.

- ⚠ 경고**
 - 부적절한 취급으로 인해, 위험한 상황이 발생하여, 사망 또는 중상등을 당할 가능성에 해당될 경우
 - ⚠ 주의**
 - 부적절한 취급으로 인해, 위험한 상황이 발생하여, 경상을 당할 가능성에 해당될 경우 또는 물적손해가 발생할 가능성에 해당되는 경우
- 아울러, **⚠ 주의** 로 기재된 사항에서도 상황에 따라 중대한 결과에 도달할 가능성이 있습니다. 어느쪽이든 중요한 내용을 기재하여 놓은 것이므로 반드시 지켜주시기 바랍니다.
- ⚠ 경고**
 - CONTROLLER의 후면에는 활전부(活電部)가 있습니다. 제 3자가 쉽게 접촉할 수 없도록 상자안에 설치하여 주십시오. 감전의 우려가 있습니다.
 - 수분 접촉의 위험이 있는 장소에는 물이 튀지 않게 주의하여 주십시오. 감전의 우려가 있습니다.
 - 젖은 손으로 조작하지 마십시오. 감전의 우려가 있습니다.
 - 설치, 이동, 배선, 점검때에는 반드시 전원을 꺼 주십시오. 감전의 우려가 있습니다.
 - MOTOR의 회전부에는 절대 접촉하지 마십시오. 부상의 우려가 있습니다.
 - 정전 또는 온도과열 보호장치(Thermal Protector)가 작동되었을 때는 전원을 꺼 주십시오. 돌발적인 재기동에 의한 부상의 우려가 있습니다.
 - ⚠ 주의**
 - 고객에 의한 개조는 폐사의 보증범위외가 되기 때문에 실시하지 마십시오. 감전, 화재의 우려가 있습니다.
 - 수리가 필요한 경우는 폐사 또는 구입점에 문의하여 주십시오.
 - CONTROLLER에는 보호 장치가 없습니다. 안전을 위하여 과전류 보호장치, 누전차단기, 온도 과열 보호장치등을 설치하여 주십시오. 화재의 우려가 있습니다.
 - 다량의 정전기를 발생하는 장소에는 사용하지 마십시오. 오동작에 따른 부상의 우려가 있습니다.
 - 손상된 MOTOR는 사용하지 마십시오. 감전 또는 부상의 우려가 있습니다.
 - 현품이 주문서와 동일한지 확인하여 주십시오. 부상, 화재 우려가 있습니다.
 - MOTOR의 주위에는 절대 가연물을 두지 마십시오. 화상 또는 화재의 우려가 있습니다.
 - 운전중 또는 운전정지 직후에는 손이나 신체를 접촉하지 마십시오. MOTOR의 표면이 고온이므로 화상의 우려가 있습니다.
 - MOTOR에는 절대 올라타거나 매달리지 마십시오. 부상의 우려가 있습니다.
 - 이상현상이 발생한 경우에는 즉시 전원을 꺼 운전을 정지시켜 주십시오. 감전, 부상, 화재의 우려가 있습니다.
 - 인화성 GAS, 부식성 GAS가 발생하는 장소에는 사용하지 마십시오. 화재의 우려가 있습니다.
 - CONTROLLER의 주위에는 가연물을 두지 마십시오. 화재의 우려가 있습니다.
 - 본 제품을 폐기 시킬 경우에는 산업 폐기물로 처리하여 주십시오.

2. 제품 도착시의 확인



주 의 • 현품이 주문서와 동일한지 확인하여 주십시오.

다른 제품이 설치된 경우 부상, 화재의 위험이 있습니다.

2. 1 현품 확인

아래의 물건이 전부 맞게 있는지 확인해 주십시오.

만약, 부족한 경우 및 파손된 경우는 가까운 지점, 영업소에 연락하여 주십시오.

- CONTROLLER ----- 1개
- 연장선(0.5m) ----- 1개
- 취급 설명서(본서) ----- 1부

2. 2 품명 확인

이 취급 설명서는 다음 제품을 대상으로 하고 있습니다. 주문한 제품인지 확인해 주십시오.

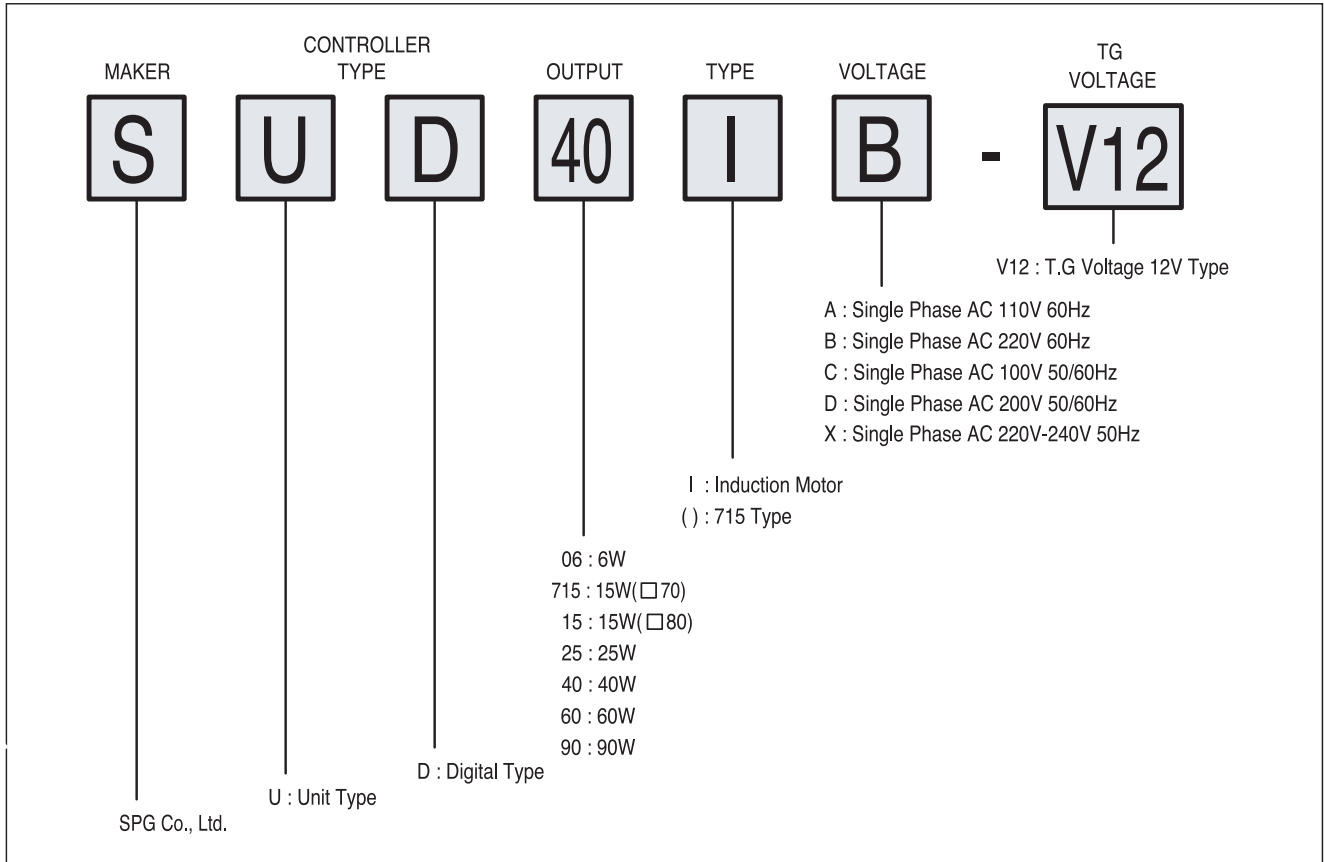
CONTROLLER의 품명, 전압, 출력은 NAME PLATE 상의 기재사항을 보고 확인해 주십시오.

MOTOR

MAKER	SIZE	TYPE	OUTPUT	SHAFT TYPE	VOLTAGE	SHAFT IMPACT TYPE	TG VOLTAGE
S	9	I	40	G	B	()	V12
				G : Gear Screw Type S : Straight Type D : D-Cut Type K : Key Type		H : Heavy Impact L : Light Impact	
				A : Single Phase AC 110V 60Hz 4Pole B : Single Phase AC 220V 60Hz 4Pole C : Single Phase AC 100V 50/60Hz 4Pole D : Single Phase AC 200V 50/60Hz 4Pole X : Single Phase AC 220V-240V 50Hz 4Pole		V12 : T.G Voltage 12V Type	
		I : Induction					
		6 : □ 60(mm)					
		7 : □ 70(mm)					
		8 : □ 80(mm)					
		9 : □ 90(mm)					
			6 : 6W(□ 60)				
			15 : 15W(□ 70)				
			15 : 15W(□ 80)				
			25 : 25W(□ 80)				
			40 : 40W(□ 90)				
			60 : 60W(□ 90)				
			90 : 90W(□ 90)				

SPG Co., Ltd.

CONTROLLER



3. 취부에 대하여

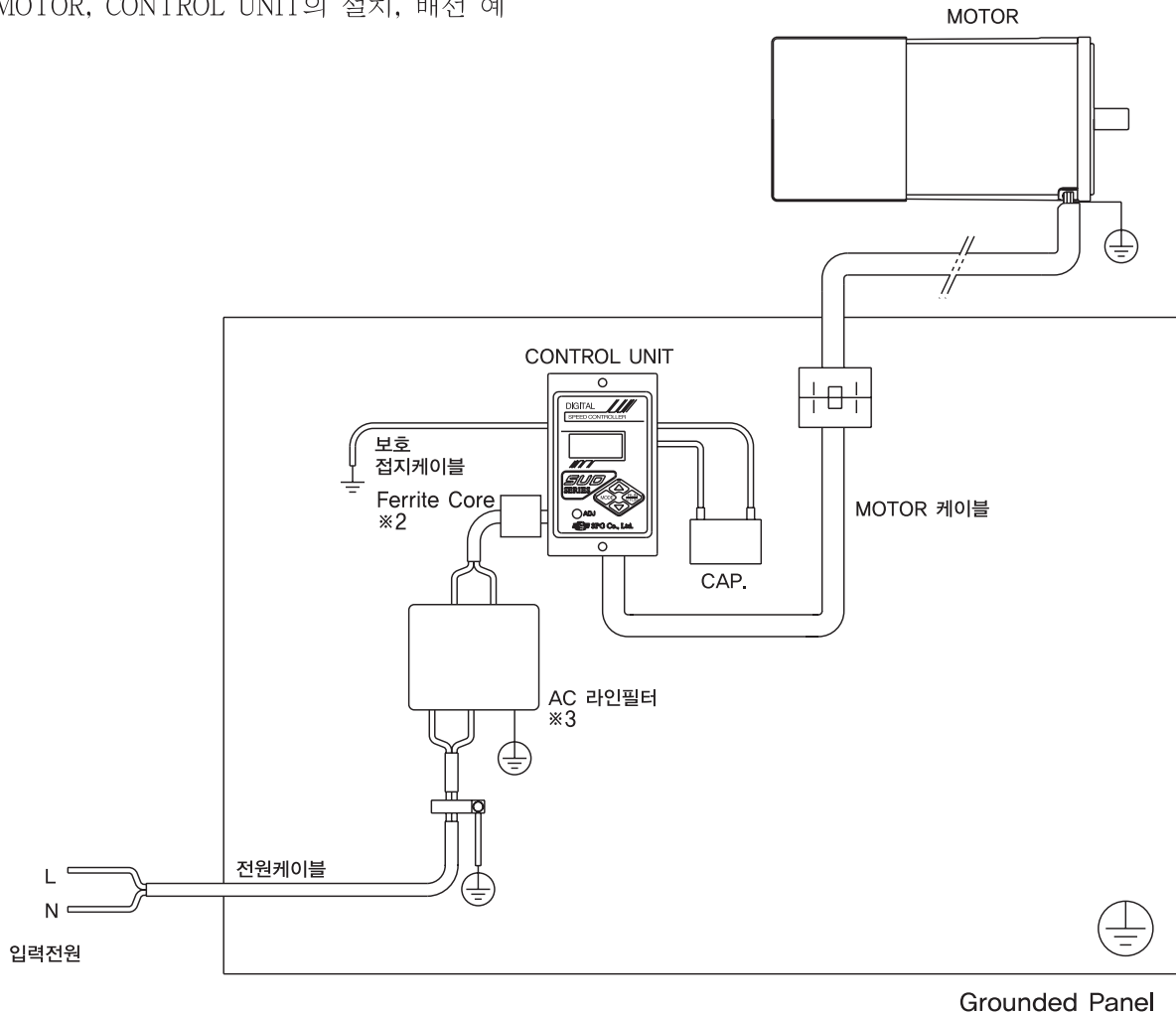
⚠ 경고

- 폭발성, 인화성 GAS, 부식성 GAS 및 물에 닿는 장소, 가연물의 근처에서는 사용하지 말아 주십시오. 감전, 부상, 화재의 위험이 있습니다.
- 통전 상태에서 취부 작업을 하지 말아 주십시오. 전원을 끄고 작업해 주십시오. 감전의 위험이 있습니다.
- 취부, 접속, 점검등의 작업은 전문 지식이 있는 사람이 행하여 주십시오. 감전, 부상, 화재의 위험이 있습니다.

⚠ 주의

- MOTOR의 사양을 넘겨서 사용하지 마십시오. 부상, 장치파손의 위험이 있습니다.
- 회전 부분에 접촉되지 않도록 COVER등을 설치해 주십시오. 부상의 위험이 있습니다.
- 기계와 결합전에 회전방향을 확실히 해 주십시오. 부상, 장치파손의 위험이 있습니다.
- 운반시 MOTOR의 출력축 또는 CABLE을 잡지 말아 주십시오. 낙하에 의한 부상의 위험이 있습니다.
- MOTOR에 올라타거나, 매달리지 마십시오. 부상의 위험이 있습니다.
- MOTOR 출력축(KEY 홈, 치절부)은 맨손으로 만지지 마십시오. 부상의 위험이 있습니다.
- MOTOR와 GEAR HEAD를 조립할 때 또는, 장치에 MOTOR를 조립할 때는 그 사이에 손이 끼지 않도록 해 주십시오. 부상의 위험이 있습니다.

■ MOTOR, CONTROL UNIT의 설치, 배선 예



- [중 요]** ※1. 단상 200V~230V일 경우, 과전압 범위Ⅲ에서 사용할 때는 노이즈 필터의 일차측에 서지 absorber를 설치, 접속하여 주십시오. (과전압범위Ⅲ이란 큰 과전압의 발생이 예상되는 TRANSFORMER의 1차 회로, 일반공장의 배전반으로 부터의 급전을 뜻합니다.)
- ※2. Ferrite Core (TDK-ZCAT3035-1330)
- ※3. AC라인필터(Dongil-ES1-F10)

4. 올바른 사용에 대하여

4. 1 POWER-ON 상태 절환 SWITCH(출하시는 “NO”로 설정되어 있습니다.)

이 MODE는 전원을 투입할 때 MOTOR의 운전 상태를 선택하는 다음의 2가지 종류의 기능이 있습니다.

YES	전원을 OFF 하기전 상태가 “RUN” 이면, 전원 투입시도 “RUN” 이 됩니다. 전원을 OFF 하기전 상태가 “STOP” 이면, 전원 투입시도 “STOP” 이 됩니다.
NO	전원을 OFF 하기전 상태가 “RUN”, “STOP” 에 관계없이 전원 투입시 “STOP” 이 됩니다.

- 통상은 “NO”에 설정 후 사용하여 주십시오. 정전 후 복구 되었을때 또는 전원 재투입시 돌발적인 운전의 위험을 방지할 수 있습니다.

- “YES”에 설정후 사용할 경우 (SET MODE에서 사용하여 주십시오.)

전원을 “개폐” 할때 RUN/STOP KEY의 조작으로 「운전」, 「정지」의 REMOTE CONTROL이 가능합니다.

설정 방법

1. POWER-ON 상태 절환 SWITCH를 “YES” 절환하여 주십시오.
2. 통전중에 RUN/STOP KEY를 한번 조작하여 주십시오. (“YES”의 동작을 인식합니다.)

⚠ 주 의

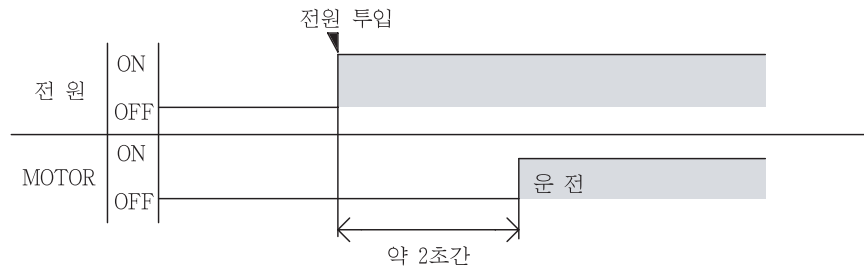
1. 전원 투입에서 운전이 시작되기까지는 RESET 시간을 위해 약 2초정도 소모됩니다.
2. RUN/STOP KEY 조작을 병용하면서 조작 횟수가 수만회를 넘을 경우 운전이 느슨하게 됩니다. 이때, “RUN”과 “STOP”이 동시에 표시됩니다. 이 상태가 되면, “NO”로 전환하고 전원을 1초이상 OFF 한 뒤 재투입함으로써 운전이 가능합니다. 단, “YES”의 기능을 사용할 수 없습니다.

4. 2 정전 후의 복구

순시정전을 검출하는 것과 정전 후 재복귀시는 정전 전의 전원 투입시와 같은 상태에 POWER-ON 상태 절환 SWITCH의 선택 상태에 따라 동작이 달라집니다.

4. 3 RESET 시간

전원 투입시에는 약 2초간의 “RESET 시간” 이 필요합니다. 또한 이시간동안은 DIGITAL 표시를 하지 않습니다.



전원 투입 후 DIGITAL 표시가 완료된후부터 KEY 조작을 하여 주십시오. 또, POWER-ON 상태절환 SWITCH가 “YES” 에서 전원을 OFF하기전 상태가 “RUN”일때는 전원 투입 후 약 2초 후에 운전을 개시합니다.

순시 정전의 경우도 마찬가지로 약 2초후에 운전을 개시합니다.

4. 4 상용주파수의 자동절환

60Hz 지역에 1400~1800rpm (승산배율이 1인 경우)으로 설정된 경우, 50Hz 지역에는 1500rpm으로 됩니다.

하지만, 50Hz 지역에서 1500rpm으로 설정된 경우는 60Hz 지역에서도 1500rpm으로 됩니다.

4. 5 이상 표시

이상현상이 발생한 경우 “RUN”과 “STOP”이 동시에 표시됩니다.

전원 재투입시 정상적으로 복귀 되는 경우가 있습니다. (단, 설정치는 출하상태로 됩니다.)

전원 재투입시에도 “RUN”과 “STOP”이 동시에 표시될때에는 내부 회로의 이상을 고려해야 합니다.

(본사 기술 연구소로 연락바랍니다.)

단, POWER-ON 상태 절환 SWITCH가 “YES”에서 RUN/STOP KEY의 조작 수명이 다한 경우는

4.1 항의 대책을 참고 하십시오.

4. 6 THERMAL PROTECTOR (자동복귀형)

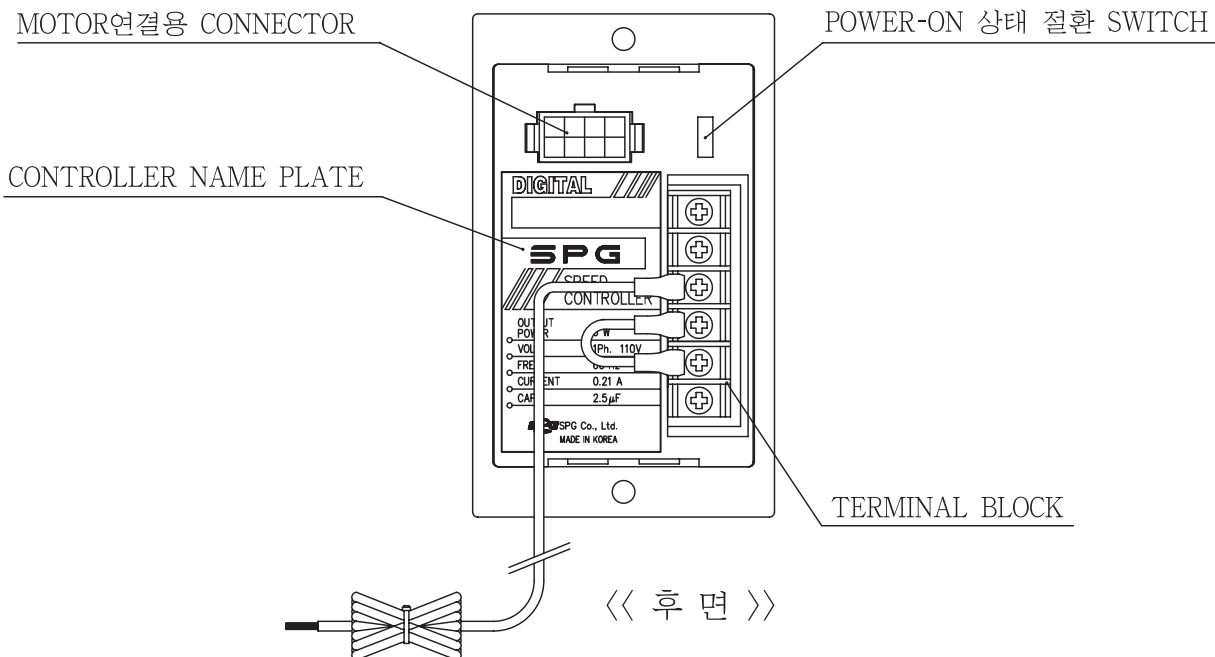
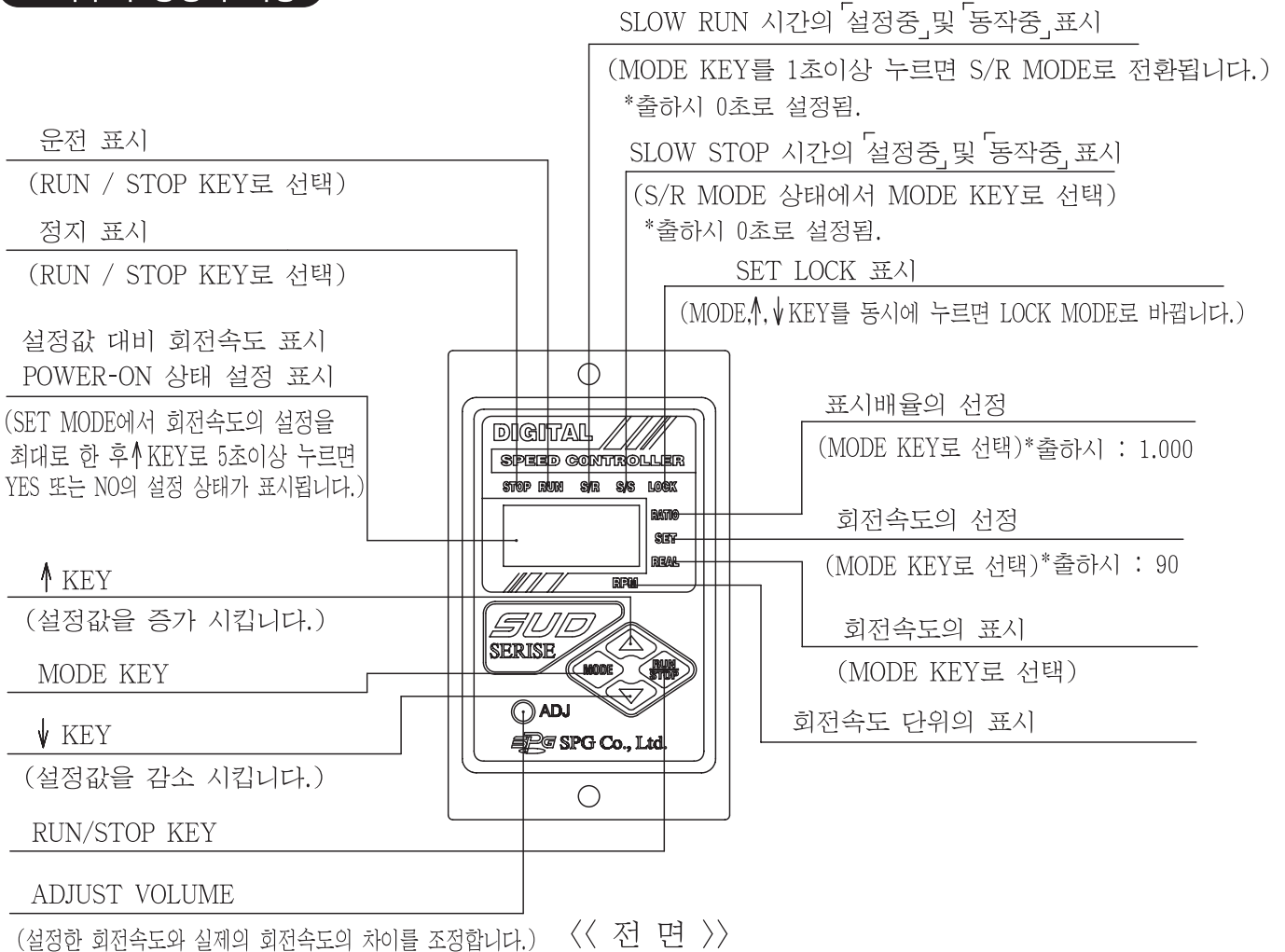
과열보호장치로서 THERMAL PROTECTOR를 내장한 MOTOR가 있습니다.

MOTOR가 과열되어 THERMAL PROTECTOR가 동작하면 운전을 정지합니다. 그 후 MOTOR가 냉각되면 THERMAL PROTECTOR가 복귀되면서 “RUN”의 조작없이 재기동합니다.

4. 7 내전압 시험, IMPULSE 전압 시험

제어반에 설치된 상태에서 LINE EARTH간의 내전압 시험, IMPULSE 내압시험, 전열저항측정 등을 하는 경우는 MOTOR 접지선 외부에서 전원 CODE의 두선을 단락시킨 후 행하여 주십시오.

5. 각부의 명칭과 기능



6. 동작 MODE의 설명

6. 1 RATIO MODE

MOTOR의 회전속도에 배율을 곱하고 속도를 설정하여 실제의 속도를 표시하는 것으로서 GEAR HEAD 출력축 회전속도의 환산과 벨트 콘베어의 반송속도 환산이 가능합니다.

(1) GEAR 감속비의 설정값 (GEAR HEAD 출력축의 회전속도에 맞게 표시하는 경우)

〈 “SET” 또는 “REAL”의 표시값 = MOTOR의 회전속도 ÷ GEAR 감속비의 설정값 〉

ex) 당사 GEAR HEAD의 감속비가 기억 되어있으므로 ↑ 와 ↓ KEY로 선택하여 주십시오.

1.000 ↔ 3 ↔ ... ↔ 100 ... ↔ 202 ... ↔ 1000 ... ↔ 2515

「14. 감속비 일람」 P16 참조

(2) 승산배율의 설정값 (벨트콘베어의 반송속도에 맞게 표시하는 경우)

〈 “SET” 또는 “REAL”의 표시값 = MOTOR의 회전속도 × 승산배율의 설정값 〉

ex) 0.005에서 0.995까지의 승산배율이 설정되어 있으므로 ↑ 와 ↓ KEY로 설정하여 주십시오.

1.000 ↔ 0.995 ↔ ... ↔ 0.015 ↔ 0.010 ↔ 0.005

(0.005 간격)

6. 2 SET MODE

회전 속도를 설정하는 MODE로 ↑ 와 ↓ KEY로 아래의 값을 선택할 수 있습니다.

표시 배율 1.000의 경우

10 rpm 단위로 선택 됩니다.

ex) • 전원주파수 50Hz : 90 ↔ 100 ↔ 110 ↔ ... ↔ 1400 ↔ 1500 rpm

• 전원주파수 60Hz : 90 ↔ 100 ↔ 110 ↔ ... ↔ 1400 ↔ ... ↔ 1700 ↔ 1800 rpm

표시 배율 1.000 이외의 경우

“RATIO” MODE에서의 표시 배율 설정과 GEAR 감속비 설정에 따라서 표시되는 것으로

↑ 와 ↓ KEY로 아래의 값을 선택할 수 있습니다.

ex) GEAR 감속비의 설정 값 = 3

10 ÷ 3 rpm 단위로 선택할 수 있습니다. 소숫점 둘째자리부터는 버리고 표시합니다.

• 전원주파수 50Hz : 29.9 ↔ 33.3 ↔ 36.6 ↔ ... ↔ 466.6 ↔ 500.0 rpm

• 전원주파수 60Hz : 29.9 ↔ 33.3 ↔ 36.6 ↔ ... ↔ 466.6 ↔ ... ↔ 566.6 ↔ 600.0rpm

ex) 승산 배율의 설정값 = 0.500

10 × 0.500 단위로 선택할 수 있습니다. 소숫점 둘째자리부터는 버리고 표시합니다.

• 전원주파수 50Hz : 45.0 ↔ 50.0 ↔ 55.0 ↔ ... ↔ 700.0 ↔ 750.0 rpm

• 전원주파수 60Hz : 45.0 ↔ 50.0 ↔ 55.0 ↔ ... ↔ 700.0 ↔ ... ↔ 850.0 ↔ 900.0rpm

6. 3 REAL MODE

REAL MODE는 MOTOR의 실제 회전속도를 표시 배율을 곱하여 표시합니다.

표시 배율 1.000의 경우

5 rpm 단위로 선택 됩니다.

ex) 0 ↔ 5 ↔ 10 ↔ ... ↔ 90 ↔ 95 ↔ 100 ↔ ... ↔ 1400 ↔ ... ↔ 1700 rpm

표시 배율 1.000 이외의 경우

RATIO MODE의 표시 배율 설정에 따라 표시됩니다.

ex) GEAR 감속비의 설정 값 = 3

$5 \div 3$ rpm 단위로 선택할 수 있습니다. 소숫점 둘째자리부터는 버리고 표시합니다.

0 ↔ 1.6 ↔ ... ↔ 29.9 ↔ 31.6 ↔ 33.3 ↔ ... ↔ 466.6 ↔ ... ↔ 566.6 rpm

ex) 승산 배율의 설정값 = 0.500

5×0.500 단위로 선택할 수 있습니다. 소숫점 둘째자리부터는 버리고 표시합니다.

0 ↔ 1.6 ↔ ... ↔ 29.9 ↔ 31.6 ↔ 33.3 ↔ ... ↔ 466.6 ↔ ... ↔ 566.6 rpm

주 표시 배율 1.000을 넘는 경우에만 " rpm " 을 표시합니다. (표시 배율 1.000 포함)
표시 배율 1.000을 미달하는 경우 아무것도 표시하지 않습니다.

6. 4 S/R MODE

SLOW RUN 시간을 설정하는 MODE로 ↑ 와 ↓ KEY로 설정하여 주십시오.

0.1초 단위로 최대 30초 까지 설정 가능합니다.

0 ↔ 0.1 ↔ ... ↔ 0.2 ↔ 0.3 ↔ 0.4 ↔ ... ↔ 29.9 ↔ 30.0 초

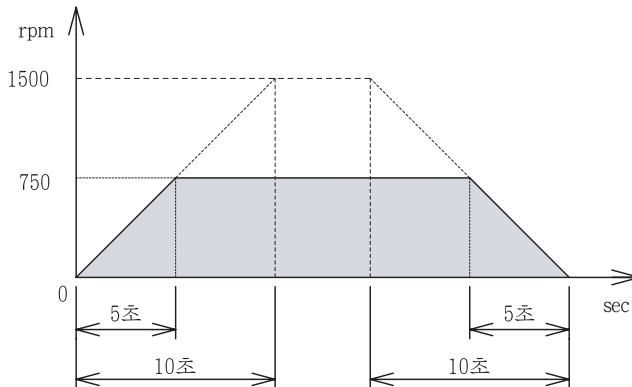
6. 5 S/S MODE

SLOW STOP 시간을 설정하는 MODE로 ↑ 와 ↓ KEY로 설정하여 주십시오.

0.1초 단위로 최대 30초 까지 설정 가능합니다.

0 ↔ 0.1 ↔ ... ↔ 0.2 ↔ 0.3 ↔ 0.4 ↔ ... ↔ 29.9 ↔ 30.0 초

주 1. SLOW RUN · SLOW STOP 시간



SLOW RUN · SLOW STOP 시간은 회전속도가 0 rpm ~ 1500 rpm 및

1500 rpm ~ 0 rpm 까지 변화하는데 필요한 시간입니다.

〈ex〉 SLOW RUN 시간을 10초로 설정하고 "SET"의 회전속도가 750 rpm 일때

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

0 rpm 에서 750 rpm 까지 도달하는데 걸리는 시간은 약 5초 입니다. SLOW STOP 시간도 동일합니다.

주 2. 부하의 관성이 클 경우는 실제의 회전 속도의 변화는 설정한 SLOW RUN SLOW STOP 시간보다 길수도 있습니다.

6. 6 POWER-ON 상태설정 MODE

POWER-ON 상태절환 SWITCH로서 전원 투입시의 운전동작을 설정하는 것이 가능합니다.

(1) “YES” 일때

전원 투입시의 운전동작은 전원을 OFF하기 전의 상태와 동일한 동작을 재현합니다.

전원을 OFF 하기 전	전원 투입 시
“RUN” 상태	기동 (약 2초 후)
“STOP” 상태	정 지

(2) “NO” 일때

전원 투입시의 운전 동작은 전원을 OFF 하기 전의 상태에 관계없이 정지합니다.

재기동을 할 경우는 RUN / STOP KEY 를 조작하여 주십시오.

전원을 OFF 하기 전	전원 투입 시
“RUN” 상태	정 지
“STOP” 상태	정 지

7. 기본 조작 방법

7. 1 운전 준비

조작 1. POWER-ON 상태설정 (출하시 “NO”)

전원 투입시의 동작 상태를 설정하여 주십시오.

조작 방법

- CASE 뒷면의 POWER-ON 상태 절환 스위치를 “YES” 또는 “NO”로 선택하여 주십시오.

통상은 “NO”로 설정 후 사용하여 주십시오. (그림 1)

△ 주의

- Page 6의 4. 1항을 참조하여 주십시오.
- 소형 드라이버로 중간 상태에서 멈추지 말고 완전히 절환하여 주십시오.

조작 2. 회전방향의 설정

조작 방법

- CASE 뒷면의 정역 WIRE로 MOTOR의 회전 방향을 C.W 또는 C.C.W 로 선택하여 주십시오(출고시 C.W입니다.) < 그림 1 >

△ 주의

- GEAR HEAD를 사용할 경우 기종에 따라 MOTOR 출력축 대비 GEAR HEAD 출력축의 회전방향이 다를 수도 있습니다.
- 회전 방향의 표시

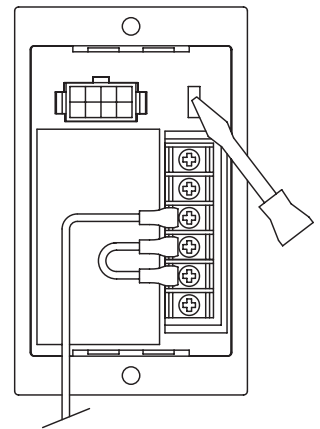
MOTOR 출력축에서 본 회전방향	
C.W	시계 방향
C.C.W	반시계 방향

조작 3. MOTOR의 접속

: MOTOR용 CONNECTOR를 접속하여 주십시오.

조작 4. 전원 투입

: 전원을 투입하여 주십시오.

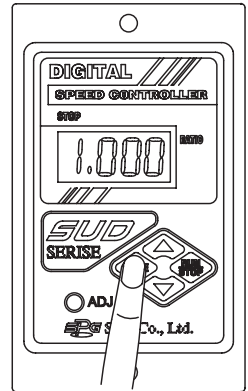
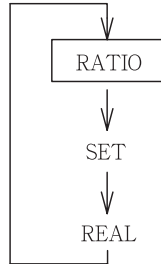


조작 5. 표시배율의 선택 (출하시 1.000)

: GEAR의 감속비 또는 승산 배율을 선택하여 주십시오.

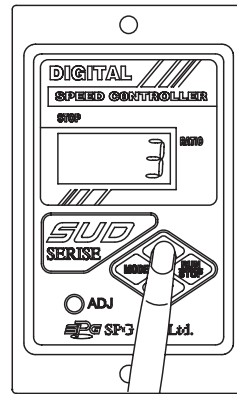
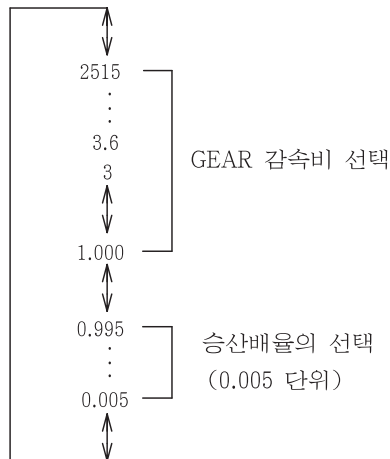
조작 방법

1. MODE KEY를 누르고 "RATIO" MODE를 선택하여 주십시오.(그림 2)

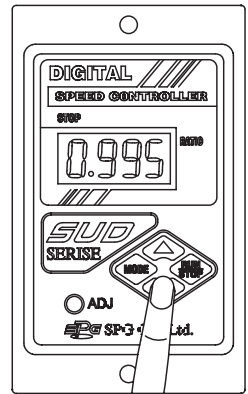


< 그림 2 >

2. $\uparrow \cdot \downarrow$ KEY를 누르고 GEAR의 감속비 또는 승산배율을 선택하여 주십시오.(그림 3,4)



< 그림 3 >



< 그림 4 >

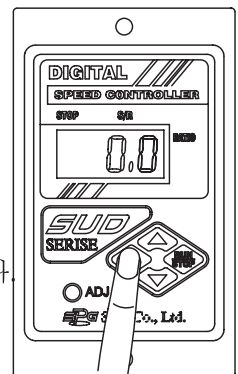
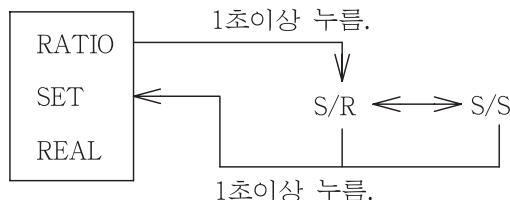
△ 주의

- GEAR의 감속비는 Page 16의 「감속비 일람」을 참조하십시오.

조작 6. SLOW RUN, SLOW STOP 시간의 설정 (출하시 0초)

조작 방법

1. "RATIO" "SET" "REAL" 등의 MODE에서 MODE KEY를 1초이상 누르면 S/R MODE로 전환되고 "S/R"을 표시합니다.(그림 5)

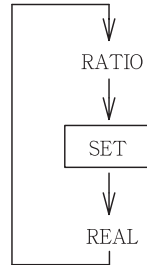


< 그림 5 >

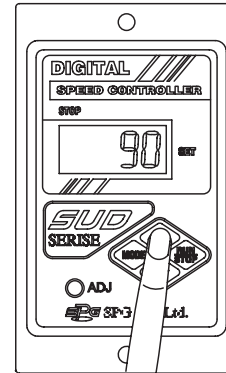
2. MODE KEY를 누르면 "S/R"와 "S/S" MODE가 상호 전환됩니다.
3. SLOW RUN · SLOW STOP 시간의 설정은 $\uparrow \cdot \downarrow$ KEY로 행하여 주십시오. 최소 0.1초부터 최대 30초까지 0.1초 단위로 설정이 가능합니다.
4. 설정한 후 MODE KEY를 누르면 설정값이 확정됩니다.
5. MODE KEY를 1초 이상 누르면 "RATIO" MODE로 돌아갑니다.

조작 7. 회전 속도의 설정

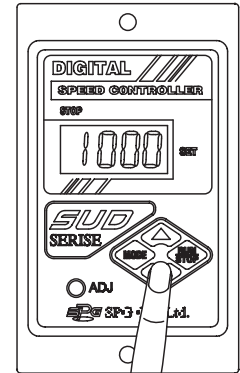
조작 방법 1. MODE KEY로 “SET” MODE를 선택하여 주십시오.



2. $\uparrow \cdot \downarrow$ KEY로 회전 속도를 설정하여 주십시오.(그림 6,7)



< 그림 6 >

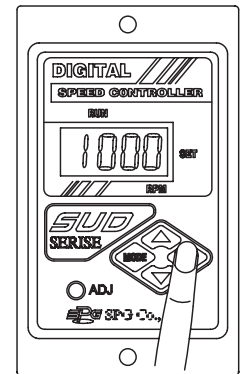


< 그림 7 >

7. 2 운 전

조작 방법 1. RUN / STOP KEY로 “RUN”을 선택하여 주십시오.(그림 8)

- △ 주의**
- 운전을 개시하면서 SLOW RUN 시간동안은 “S/R”의 표시가 점등하고 S/R 시간 종료 후 소등합니다.
 - 운전중에도 “SET”을 선택하고 $\uparrow \cdot \downarrow$ KEY로 회전속도의 조정이 가능합니다.
 - 운전중에도 “S/R” “S/S”를 선택하고 $\uparrow \cdot \downarrow$ KEY로 SLOW RUN, SLOW STOP의 시간조정이 가능합니다.



< 그림 8 >

7. 3 회전 방향의 변경

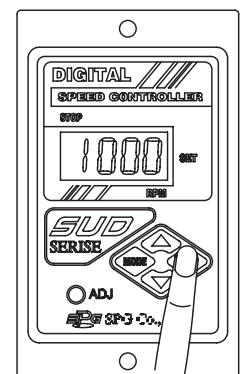
조작 방법 1. 뒷면의 정역 LEAD를 절환하여 주십시오.

- △ 주의**
- “C.W”, “C.C.W”는 MOTOR축의 회전방향을 표시합니다.
 - MOTOR가 정지한 상태에서 정역 LEAD를 절환하여 주십시오.
(운전중의 절환은 고장의 원인이 됩니다.)

7. 4 정 지

조작 방법 1. RUN/STOP KEY로 “STOP”을 선택하여 주십시오.(그림 9)

- △ 주의**
- SLOW STOP의 시간 동안은 “S/S”의 표시가 점등하고 S/S 시간 종료 후에는 소등합니다.
 - MOTOR가 정지한 상태에서 정·역회전 방향을 절환하여 주십시오.
전원을 OFF해도 “RATIO” “SET” “S/R” “S/S”의 조건을 기억하기 때문에 동일 조건에서 재운전이 가능합니다.



< 그림 9 >

8. 특수조작방법

8. 1 ADJ (회전속도의 미세조정)

“SET” MODE에서 회전속도의 설정값은 부하의 상태에 따라 실제의 회전속도(REAL MODE에서 표시되는 회전속도)와 차이가 발생할 수도 있습니다.

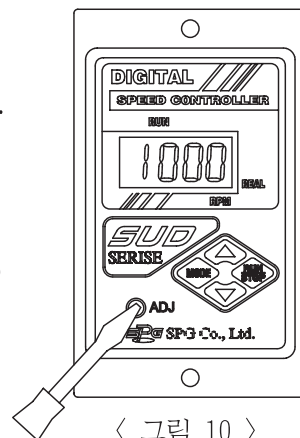
이 차이는 “ADJ”를 사용하면 보정이 가능합니다.

조작 방법

1. “SET” MODE에서 사용하고자하는 회전속도를 설정하여 주십시오.
90rpm에서 1700rpm까지의 넓은 범위를 사용하는 경우는
1000 rpm에 설정하여 주십시오.
2. “REAL” MODE에서 실제의 회전속도를 읽으면서 설정이하의 회전
속도가 되면 “ADJ”의 VOLUME으로 조정하여 주십시오.(그림 10)

△ 주의

- 보정을 행할때 부하 변동, 온도변화에 따른 차이가 발생할 경우가 있습니다.
- 넓은 회전속도 범위에 사용할 경우 MOTOR의 비선형성이 되는
영역을 보정하는 것은 불가능 합니다.
- “ADJ” VOLUME을 무리하게 돌리거나 강하게 밀지 말아 주십시오.



〈 그림 10 〉

8. 2 LOCK 기능

“LOCK”은 일단 설정한 운전조건을 KEY의 오조작을 방지하기 위한 기능입니다.

〈 “LOCK” 중에 인식하지 못하는 KEY의 조작 〉

1. MODE KEY (RATIO, SET, S/R, S/S의 변경은 불가능합니다.)
2. ↑ ↓ KEY

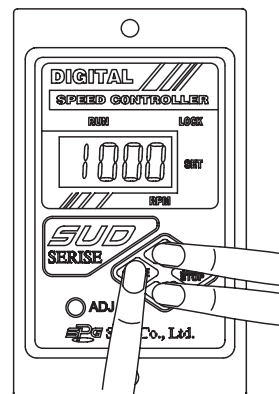
〈 ” LOCK ” 중에 인식하는 KEY의 조작 〉

1. RUN / STOP KEY
2. “ADJ”로서 회전속도의 미세조정.
3. POWER-ON 상태의 설정.

조작 방법

〈 “LOCK”의 설정방법 〉

1. “LOCK”은 “RUN” 또는 “STOP” “SET” 또는 “REAL”
MODE에서 행하여 주십시오.
2. MODE KEY를 누른 상태에서 1초이내에 ↑ 와 ↓ KEY를 동시에 눌러
주십시오.(그림 11) “LOCK”이 설정되면 “LOCK”이 표시 됩니다.



〈 그림 11 〉

〈 “LOCK” 을 해제하는 방법 〉

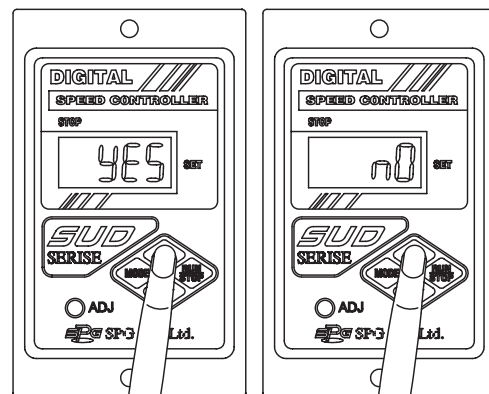
1. “LOCK”의 설정방법과 동일한 조작으로 해제를 합니다.
2. 전원을 OFF 해도 해제가 됩니다.

8. 3 POWER-ON 상태설정 표시

POWER-ON 상태설정은 아래의 조작으로 표시 됩니다.

조작 방법

1. “STOP”으로 하여 주십시오.
2. “SET” MODE에서 회전 속도의 설정을 최대
(60Hz 지역에서는 1800rpm, 50Hz 지역에서는
1500rpm)에 두고↑ KEY를 5초간 누르면 “YES”
또는 “NO”를 표시합니다.(그림 12)
3. 표시를 해제하려면↓ KEY를 눌러 주십시오. 원래의 “SET”
MODE로 되돌아 갑니다.



〈 그림 12 〉

9. 점 검

사용 환경(온도, 습도, 티끌, 먼지, 진동 등)의 영향이나 사용부품의 정년변화, 수명등이 발생하고 예상치 못한 사고를 미연에 방지하기 위하여 평소 다음의 점검이 중요합니다.

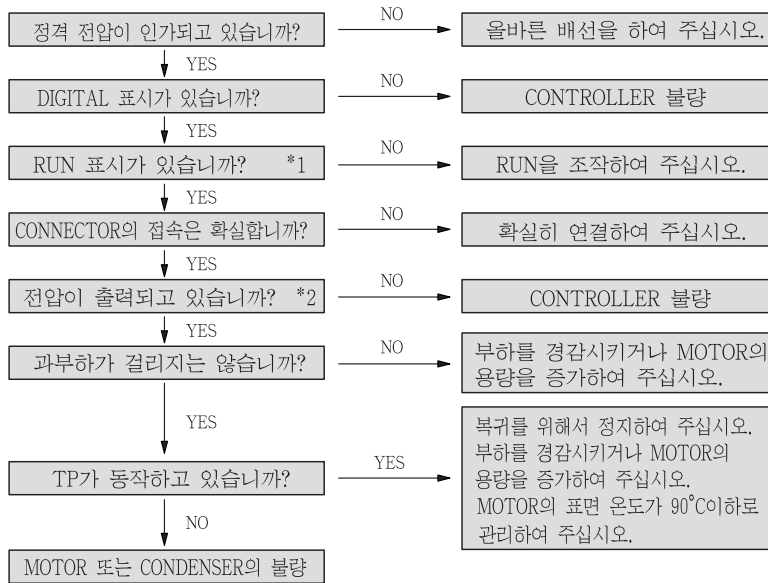
1. 운전이 원활하게 행하여 집니까?
2. 운전중 MOTOR에 이상음이 발생하지는 않습니까?
3. MOTOR가 이상 발열이 나지는 않습니까?

10. 고장시 원인과 대책

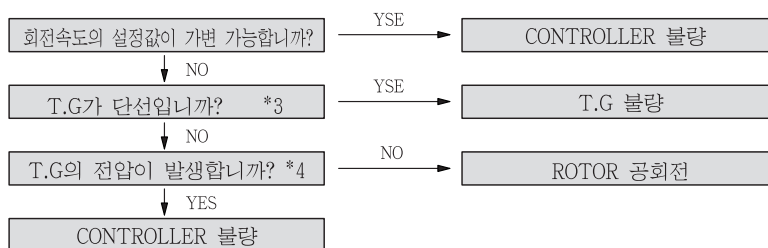
고장이 발생한 경우 다음의 표에 따라 점검, 대책을 행하여 주십시오.

만약, 원인을 모를 경우와 고장이라 생각될 경우 다소 불편하시더라도 구입점 또는 본사 기술 연구소로 연락하여 주십시오.

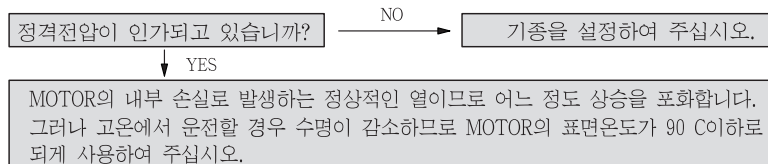
1. MOTOR가 회전을 하지 않을때



2. MOTOR가 가변이 되지 않을때



3. MOTOR 회전시 이상열이 발생한 경우



*1. RUN/STOP 동시에 표시할 경우 CONTROLLER 불량 또는 “YES”의 조작 회수 수명한도입니다.
“NO”로 사용하여 주십시오.

*2. 전압측정 : MOTOR CONNECTOR 투입상태에서 MOTOR의 흑-백, 흑-회 전압을 측정하여 주십시오.
<C.W 흑-백 = 100V> <C.C.W 흑-회 = 100V> (200V 사양은 2배 전압)

*3. 도통 TEST.
MOTOR CONNECTOR를 분리한 상태에서 적색-적색 선의 저항을 확인하여 주십시오.

*4. 전압측정.
MOTOR CONNECTOR를 연결한 상태에서 적색-적색 선의 전압을 측정하여 주십시오.

11. 사양

MOTOR 명 항 목	SUD□ IA-V12	SUD□ IB-V12	SUD□ IC-V12	SUD□ ID-V12	SUD□ IX-V12
정격 전압	단상 110V	단상 220V	단상 100V	단상 200V	단상 220V-240V
사용 전압 범위	±10% (정격 전압 대비)				
전원 주파수	60Hz	60Hz	50/60Hz	50/60Hz	50Hz
속도 제어 범위	60Hz : 90 - 1700 rpm 50Hz : 90 - 1400 rpm				
속도 변동율	5% (표준치)				
속도 설정	DIGITAL 설정				
SLOW RUN SLOW STOP 시간	0.1 ~ 30초				
사용 온도 범위	0 ~ 40°C				
보존 온도 범위	-10 ~ 60°C				
사용 습도 범위	85% RH이하 (결로가 없는 곳)				

12. OPTION

〈연장선〉

명 칭	CODE 길이
SOEW-05	0.5 m
SOEW-10	1.0 m
SOEW-15	1.5 m
SOEW-20	2.0 m
SOEW-40	4.0 m
SOEW-50	5.0 m

13. 기능 일람

기 능	내 용
회전 방향의 전환 기능	정·역 회전 단자 처리 (출하시 C.W로 설정)
운전 / 정지	RUN / STOP KEY로 설정
회전 속도의 설정	DIGITAL 설정 (승산배율 10rpm 단위)
표시 배율의 설정	GEAR 감속비 (감속비 일람 참조)와 승산배율(0.005단위)로 설정
SLOW RUN SLOW STOP	0.1초 ~ 30초 (0.1초 단위)
POWER-ON 상태의 설정	전원 투입시 전원 상태의 설정
LOCK 기능	오조작 방지
설정 PARAMETER 기억	전원을 OFF 설정 PARAMETER 기억

14. 감속비 일람

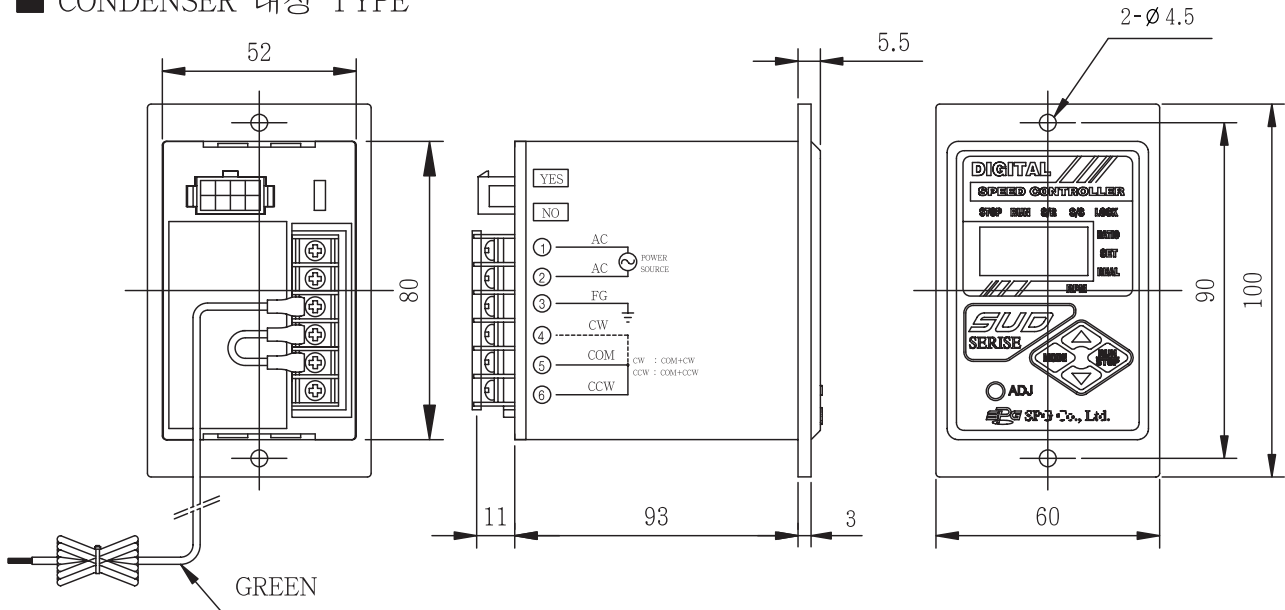
실감속비와 공칭감속비가 조금 다를수가 있으니 참고하여 설정하여 주십시오.

공 칭 감 속 비	실 감속비							중 간
	60角 6W	70角 15W	80角 15W	80角 25W	90角 40W	90角 60W	90角 90W	GEAR HEAD
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	-	-	-	-	-	-	

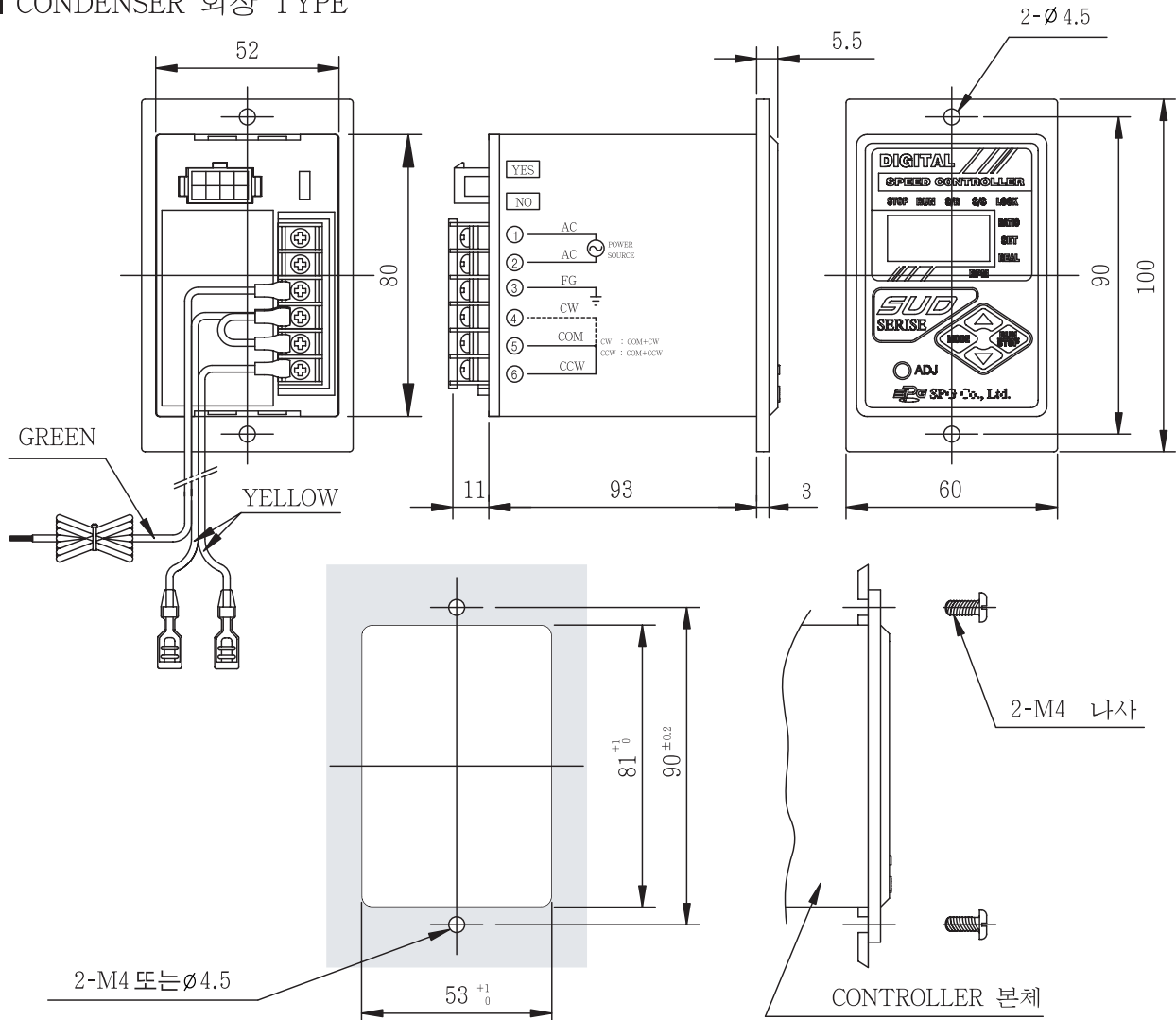
〈예〉 40W 의 공칭 감속비
1/200일 경우, 실감속비는
약1/201.8이므로 RATIO의
설정은 201.8로 설정하여
주십시오.

15. 외 관 도 (CONTROLLER)

CONDENSER 내장 TYPE



CONDENSER 외장 TYPE



21C, for world geared motor !



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기타 자세한 문의사항은 본사 기술 연구소, 영업부로 연락바랍니다.

SPEED CONTROLLER AND CONTROL MOTORS

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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.		03 : 3W 90 : 90W 06 : 6W 120 : 120W 15 : 15W 150 : 150W 25 : 25W 180 : 180W 40 : 40W 200 : 200W 60 : 60W		A : 1ØAC 110V 60Hz (4Pole) B : 1ØAC 220V 60Hz (4Pole) C : 1ØAC 100V 50/60Hz (4Pole) D : 1ØAC 200V 50/60Hz (4Pole) E : 1ØAC 115V 60Hz (4Pole) X : 1ØAC 220~240V 50Hz (4Pole) U : 3ØAC 200V 50/60Hz (4Pole) T : 3ØAC 220V 50/60Hz (4Pole) S : 3ØAC 380~440V 50/60Hz (4Pole)		H : Heavy Impact L : Light Impact	
		I : Induction Motor R : Reversible Motor		G : Gear Type S : Straight Type D : D-Cut Type K : Key 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	
		6 : □60(mm) 7 : □70(mm) 8 : □80(mm) 9 : □90(mm)				※ 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
		01 : 6W 02 : 15W~90W
		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)
SR SERIES		※ (NOTE) The applicable motor is for T.G. 12V.

SPEED CONTROLLER (SS PACK TYPE)

CONTROLLER TYPE	VOLTAGE	OUTPUT	RUN / STOP TYPE
SS	B	01	- SRSS
		01 : 6W(Standard Type) 02 : 15W~40W(Standard Type) 03 : 6W~90W(High Output Type)	Slow Run Slow Stop
		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 AC220V~240V 50Hz (4Pole)	
SS SERIES		※ (NOTE) The applicable motor is for T.G. 24V.	

SPEED CONTROLLER (UNIT TYPE)

MAKER	CONTROLLER TYPE	OUTPUT	TYPE	VOLTAGE	T.G VOLTAGE
S	U	A	40	I	B
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
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 : $NH = B \times i[\text{rpm}]$
- Lowest number of rotations of the required motor : $NL = A \times i[\text{rpm}]$

(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 $[\text{g} \cdot \text{cm}]$

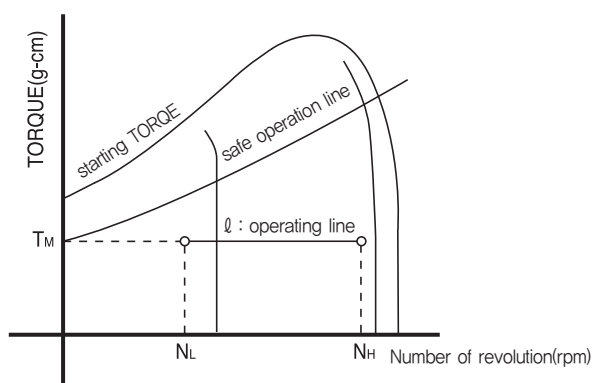
T_L : torque necessary to operate actual load $[\text{g} \cdot \text{cm}]$

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

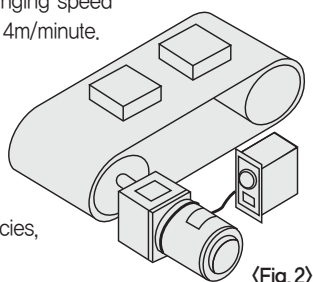
(6) Selection of gearhead

- 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

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

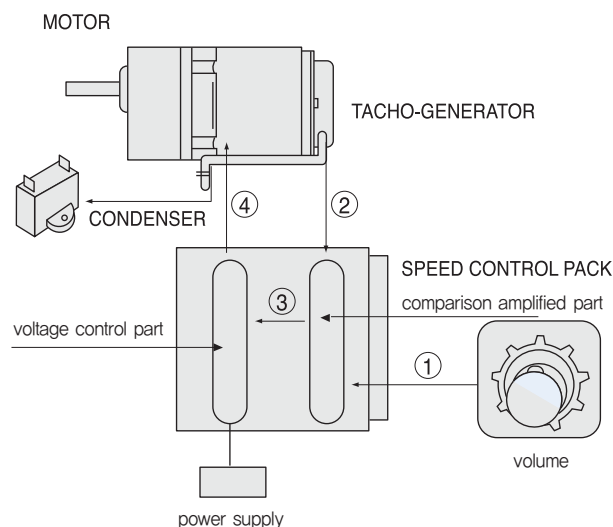
(6) Selection of motor

- 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.

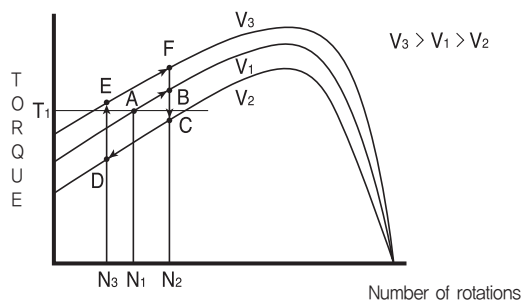


〈Fig.3〉 Basic structure of speed control for the close loop voltage control method

- 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

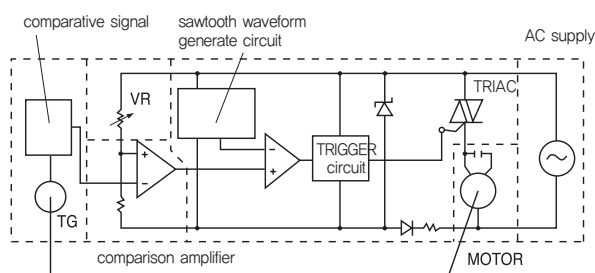
- <Fig. 4> shows the relationship between the torque of the induction motor and the number of rotations as applied voltage (primary voltage) changes.



<Fig. 4>

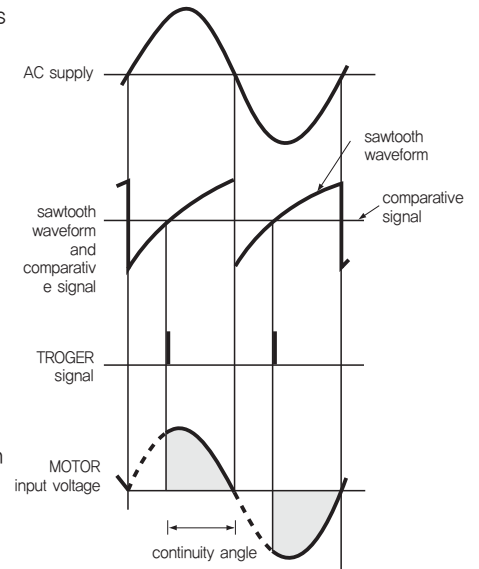
- Point A indicates current voltage (V_1), torque of the load (T_1), and the number of rotations (N_1). When rpm increases to N_2 and voltages changes to V_2 , torque of the load changes to C
- At C, the torque of the load T_1 is larger than the torque of the motor, thus the number of rotations drops 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>.

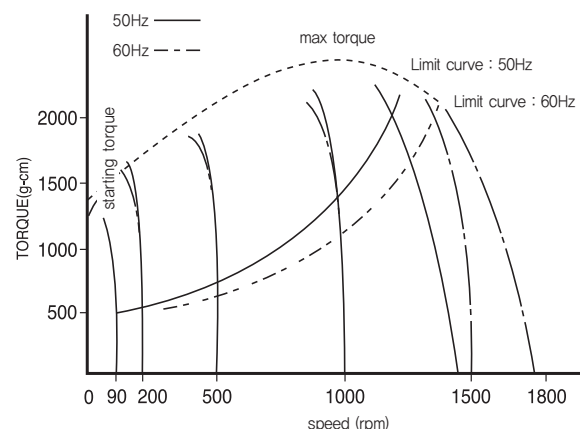


<Fig. 6>

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



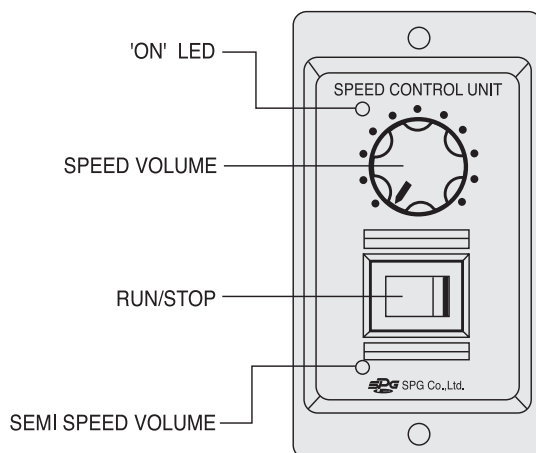
1. How to use

(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

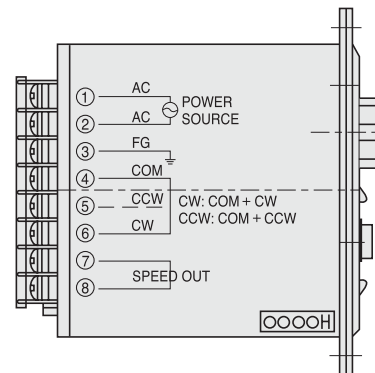
- 1) If the 「SPEED VOLUME」 switch of the analogue type speed controller is turned clockwise, number of rotation of the motor increases and when turned counterclockwise, it slows down.
- 2) It is possible to control and designate the speed of the motor between 90[rpm]~1400[rpm] at 50Hz and 90[rpm]~1700[rpm]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

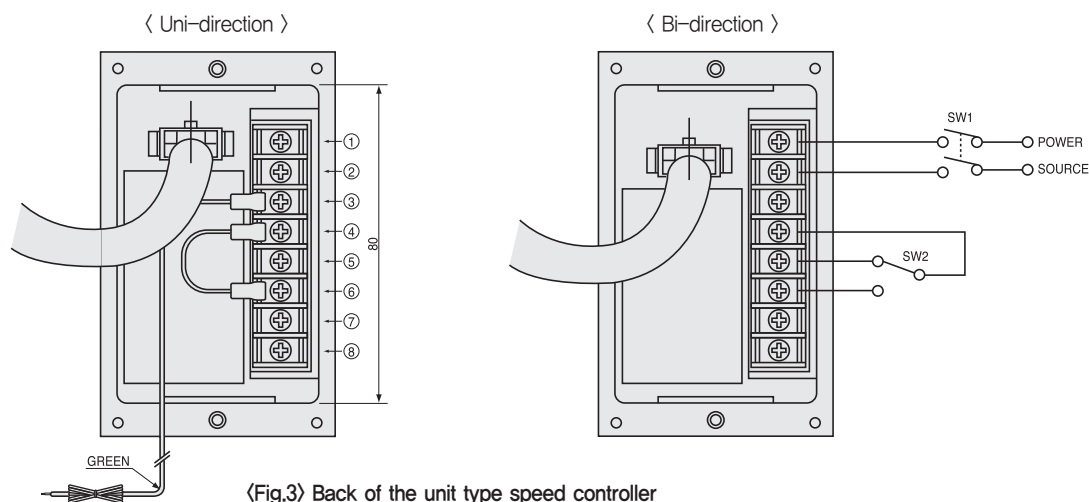
(4) Changing of rotation direction 〈Fig. 3〉

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 ②AC 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.



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

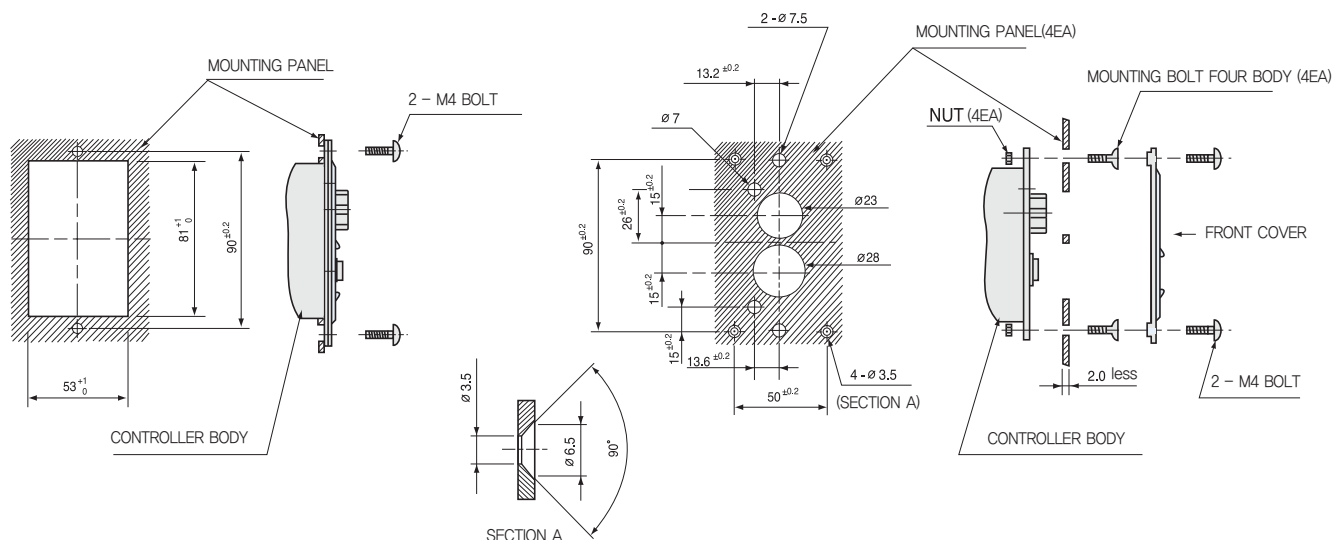
- There are 2 ways to combine the control unit

(1) Combination by making a rectangular hole 〈Refer to Fig. 4A〉

- Make rectangular holes in the combination panel.
- 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〉

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



〈Fig.4〉 Analogue controller combination

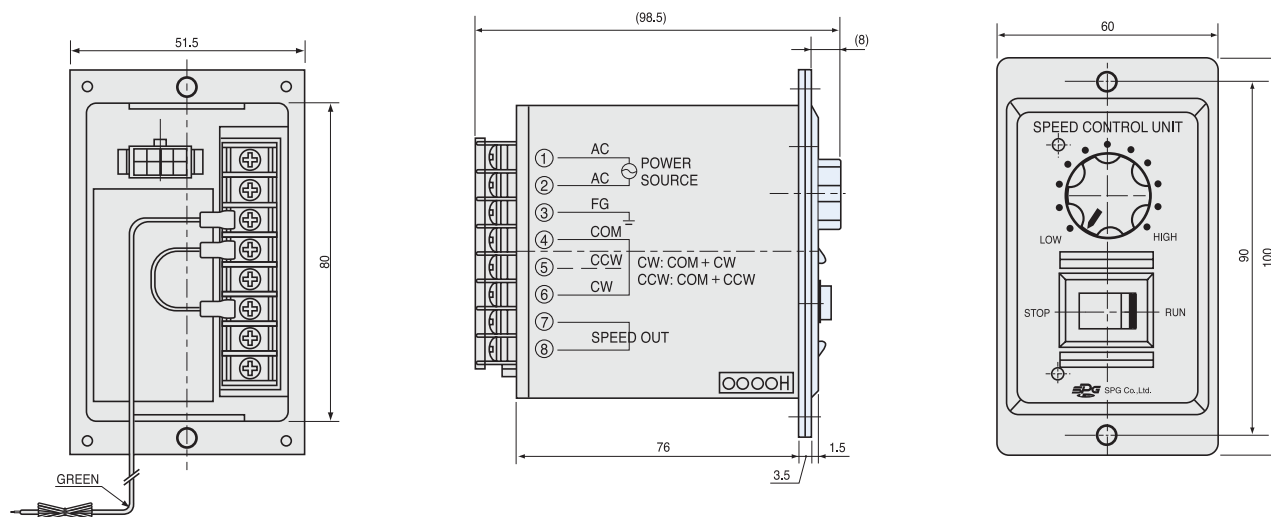
4. SPECIFICATIONS

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℃				
Storage Temperature	-10~60℃				
Ambient humidity	85% Maximum(non condensing)				

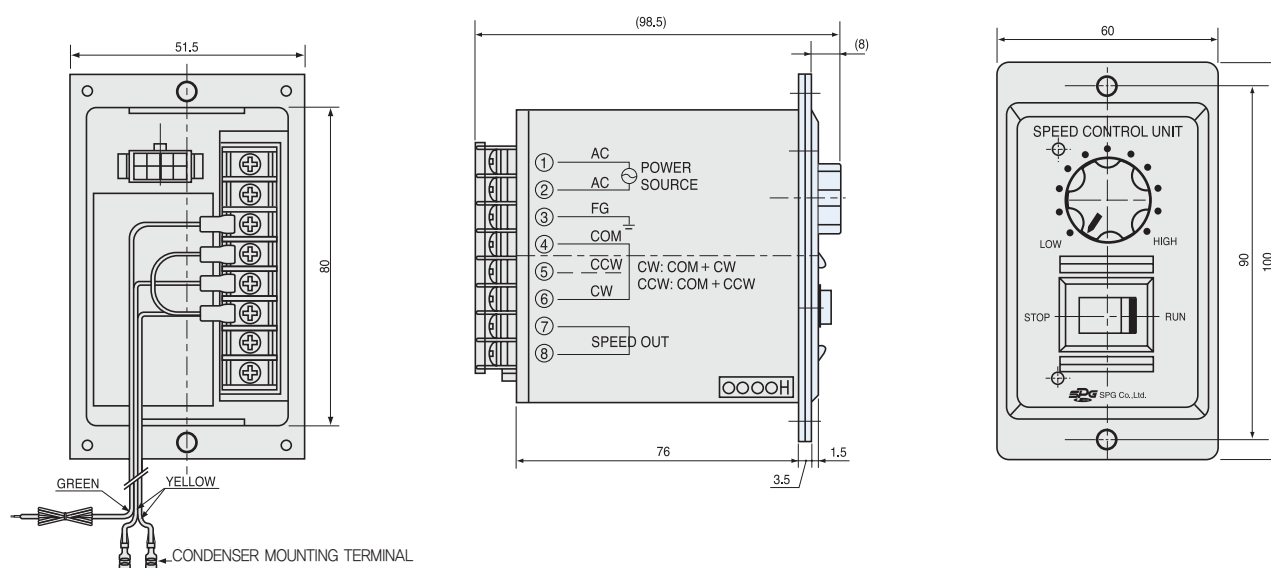
DIMENSIONS

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

⚠ Caution

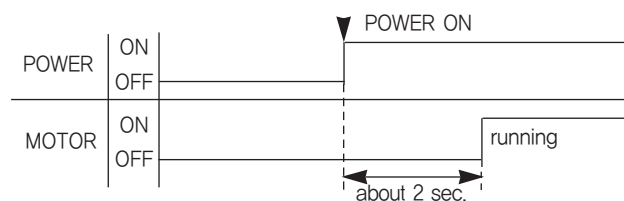
- It takes about 2 seconds to commence operation after the power is supplied.
- Both "Run" and "Stop" may lighten up when the "Run/Stop" key is used over 10,000 times. In such a case, alter the switch to "No" for a second to restore its normal condition.

(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.

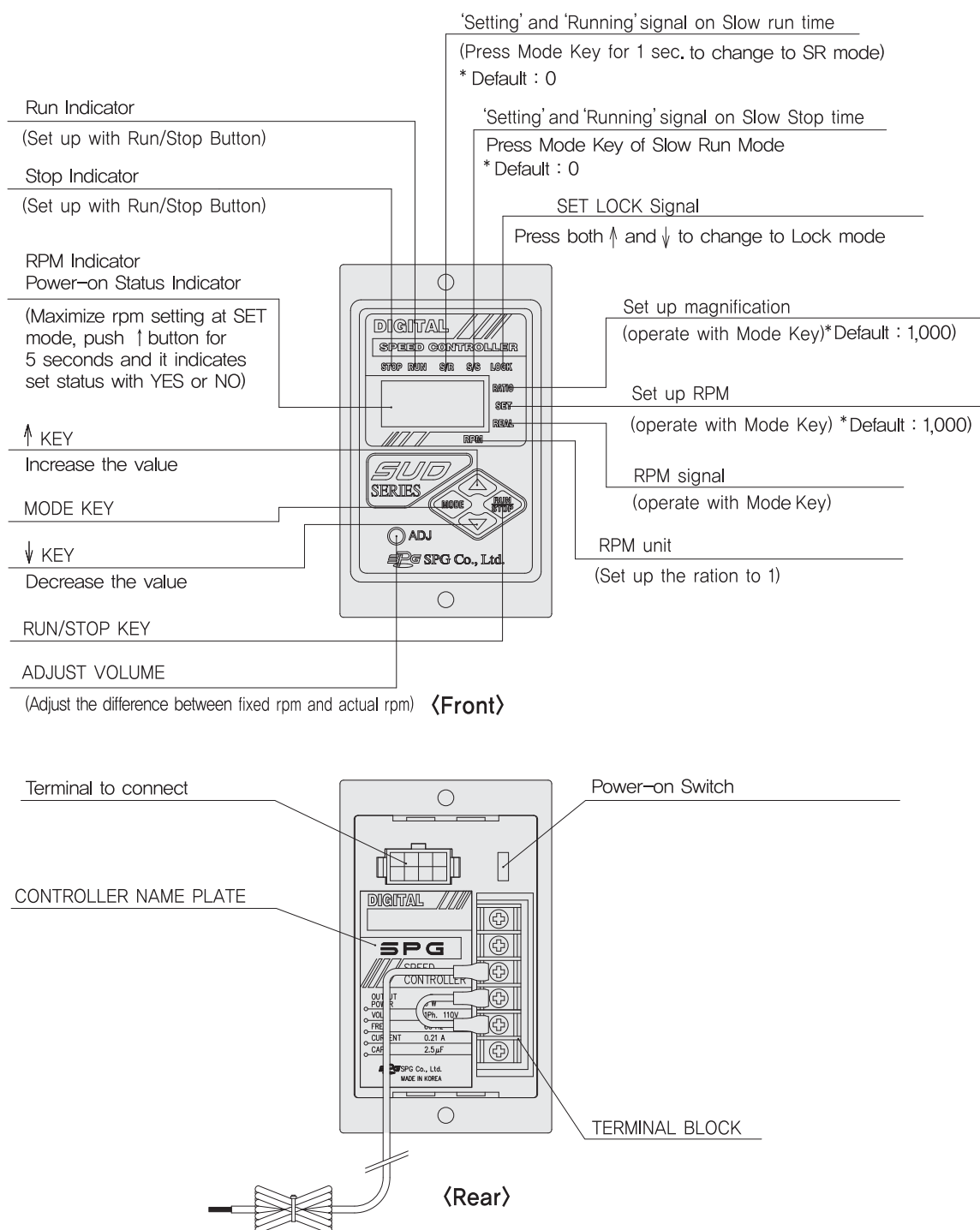
(6) Thermal protector

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

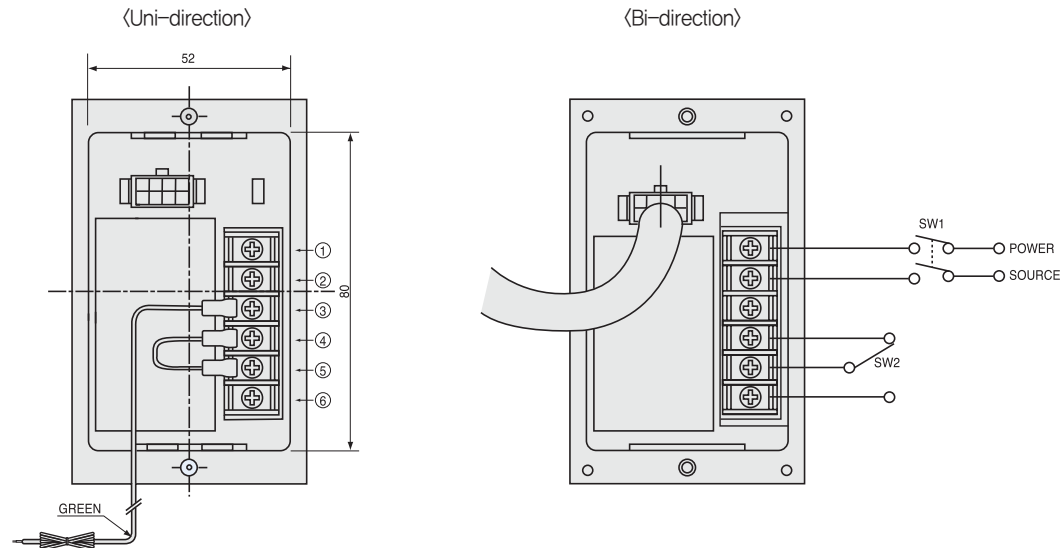
Need to disconnect of two power codes from outer motor wire in the case of withstand voltage testing with line earth, impulse voltage testing and testing of heat transfer resistance.

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

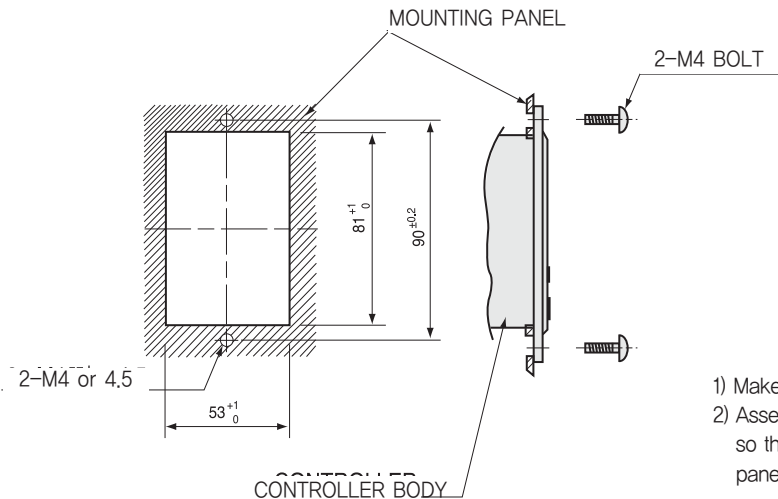
- To reverse the direction of rotation from clockwise to counter-clockwise, connect ⑤COM and ⑥CCW instead of connecting ⑤COM and ④CW.
- Power cords should always be connected to ①AC and ②AC terminals. Do not forget to turn the power off before connecting.

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, 10 X 0.500. 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, 5 X 0.500. 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.

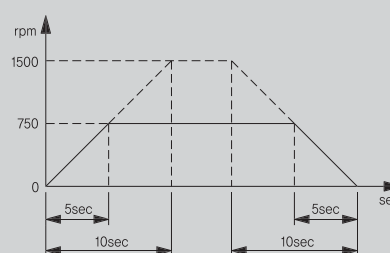
(5) S/S MODE

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

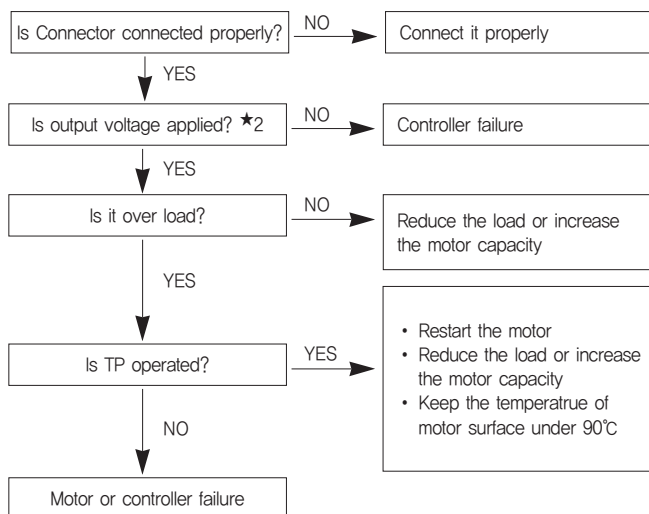
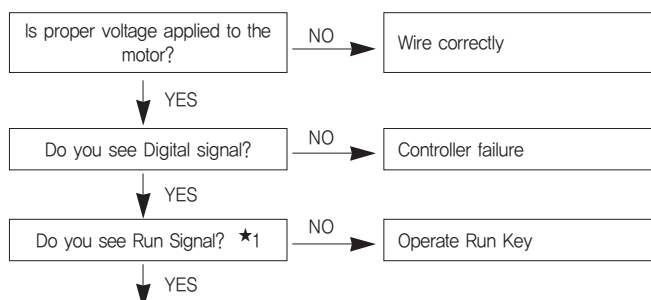
The gear ratio between actual and nominal can be different. Prefer to the chart in below

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	-	-	-	-	-	-	

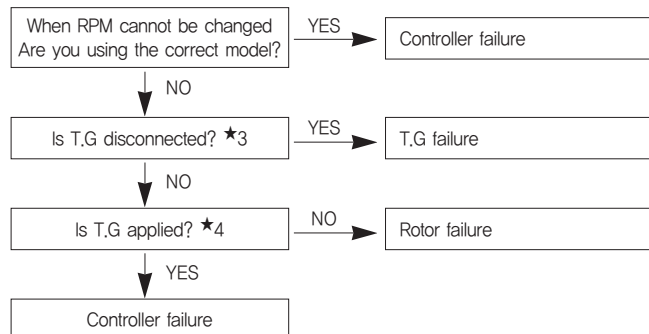
7. Trouble shooting

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.

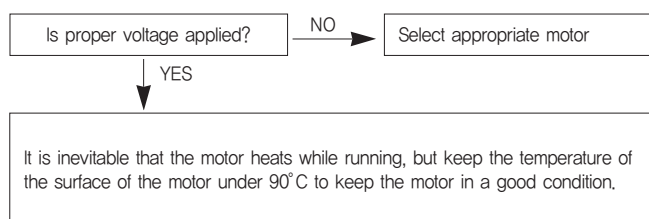
1. The motor does not rotate



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.

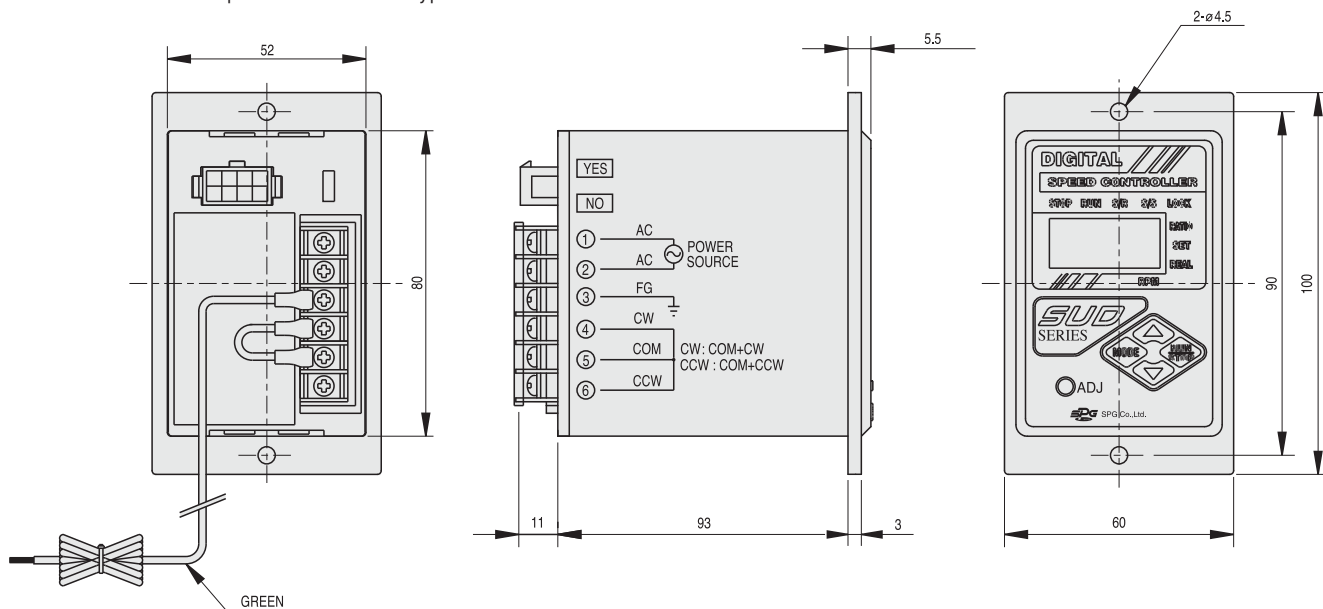
8. Specifications

MODEL List	SUD□IA-V12	SUD□IB-V12	SUD□IC-V12	SUD□ID-V12	SUD□IX-V12
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)				

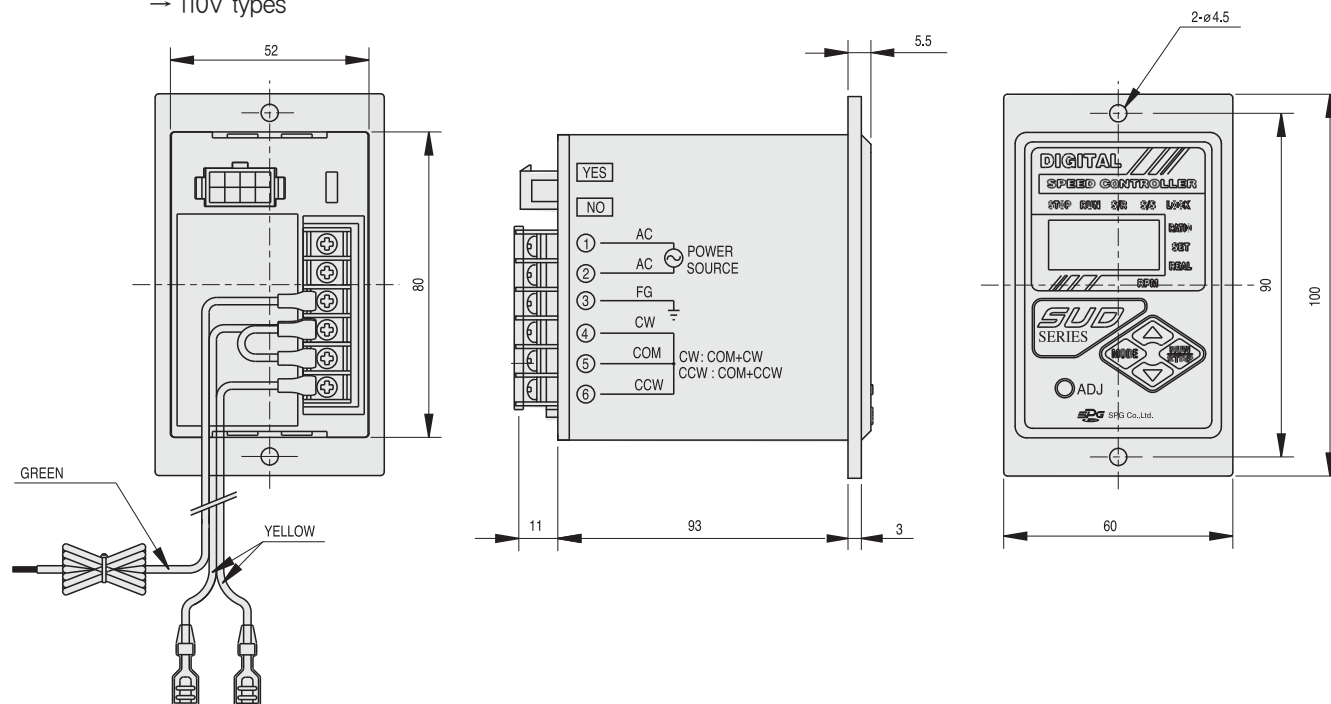
DIMENSIONS

✦ 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)



6W

INDUCTION SPEED CONTROL MOTOR
□ 60mm CONNECTOR TYPE

SIZE mm sq.	Motor Type	Controller Type	Poles	Output	Voltage	Freq.	Duty	Speed Range	Permissible Torque				Starting Torque		Cap.
				(W)	(V)	(Hz)			at 1200rpm	at 90rpm	(kg-cm)	(N-m)	(kg-cm)	(N-m)	
60	S6I06GA-V12 S6I06GA-V12CE	SUA06IA-V12	4	6	1 ∅ 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 ∅ 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 ∅ 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 ∅ 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 ∅ 220	50	Cont.	90-1400	0.35	0.035	0.22	0.022	0.35	0.035	0.7
					1 ∅ 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.

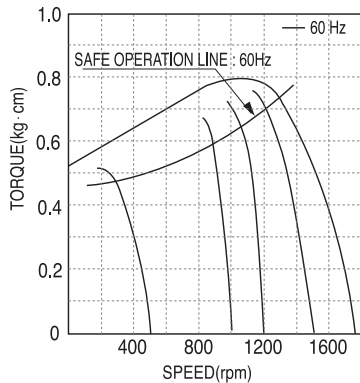
50Hz

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	250
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	6
S6DA □ B	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	2.942

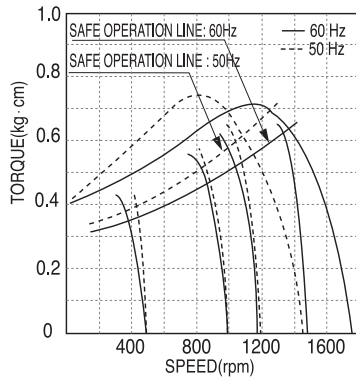
60Hz

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	250
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	7.2
S6DA□B	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

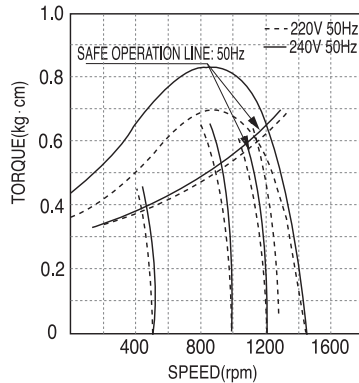
- ❖ The value in □ of gearhead model is for gear ratio.
- ❖ This is permissible torque of the assembled motor and gearhead.
- ❖ The permissible torque of the motor and inter-decimal gearhead is 30 kg-cm.
- ❖ ■ color indicates that the output shaft of the geared motor rotates in the same direction as 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

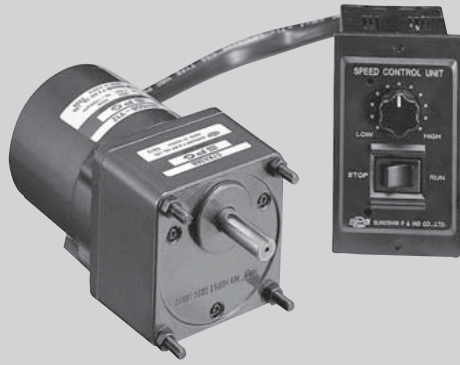


▲ S6I06GC-V12, S6I06GD-V12
S6I06GC-V12CE, S6I06GD-V12CE



▲ S6I06GX-V12
S6I06GX-V12CE

MODEL	TYPES OF OUTPUT SHAFT
GEAR TYPE	
S6I06G□-V12	
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. (μF)
									at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
70	S7I15GA-V12 S7I15GA-V12(TP) S7I15GA-V12CE	SUA715A-V12	4	15	1 ∅ 110	60	Cont.	90-1700	1.15	0.115	0.60	0.060	0.90	0.090	5.0
	S7I15GB-V12 S7I15GB-V12(TP) S7I15GB-V12CE	SUA715B-V12	4	15	1 ∅ 220	60	Cont.	90-1700	1.15	0.115	0.60	0.060	0.90	0.090	1.2
	S7I15GC-V12 S7I15GC-V12(TP) S7I15GC-V12CE	SUA715C-V12	4	15	1 ∅ 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					
	S7I15GD-V12 S7I15GD-V12(TP) S7I15GD-V12CE	SUA715D-V12	4	15	1 ∅ 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					
	S7I15GX-V12 S7I15GX-V12CE	SUA715X-V12	4	15	1 ∅ 220	50	Cont.	90-1400	1.05	0.105	0.50	0.050	0.70	0.070	0.9
					1 ∅ 240				1.25	0.125	0.60	0.060	0.85	0.085	

- ❖ 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.

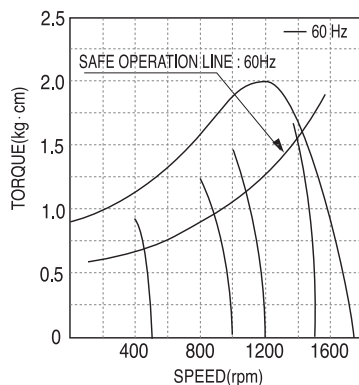
50Hz

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
	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
MODEL	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
	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

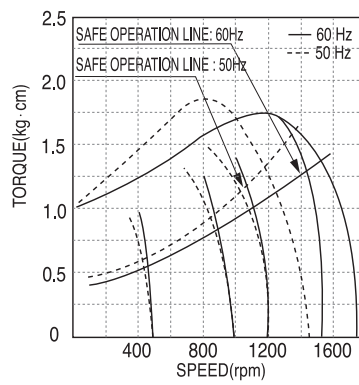
GEAR RATIO		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
MODEL	rpm	600	500	360	300	240	200	180	144	120	100	90	72	60	50	45	36	30	24	20	18	15	12	10	9
S7KA□B	kg-cm	3.0	3.6	5.1	6.1	7.6	9.1	10.1	12.7	15.2	18.2	18.2	22.8	27.3	32.8	36.5	41.0	49.2	50.0	50.0	50.0	50.0	50.0	50.0	50.0
	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.



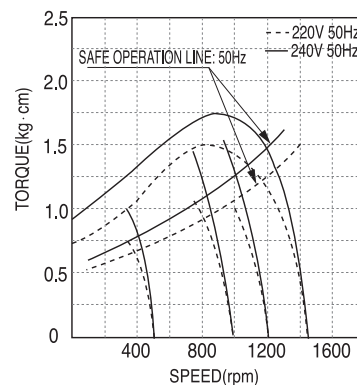
▲ S7I15GA-V12
S7I15GA-V12(TP)
S7I15GA-V12CE

▲ S7I15GB-V12
S7I15GB-V12(TP)
S7I15GB-V12CE



▲ S7I15GC-V12
S7I15GC-V12(TP)
S7I15GC-V12CE

▲ S7I15GD-V12
S7I15GD-V12(TP)
S7I15GD-V12CE



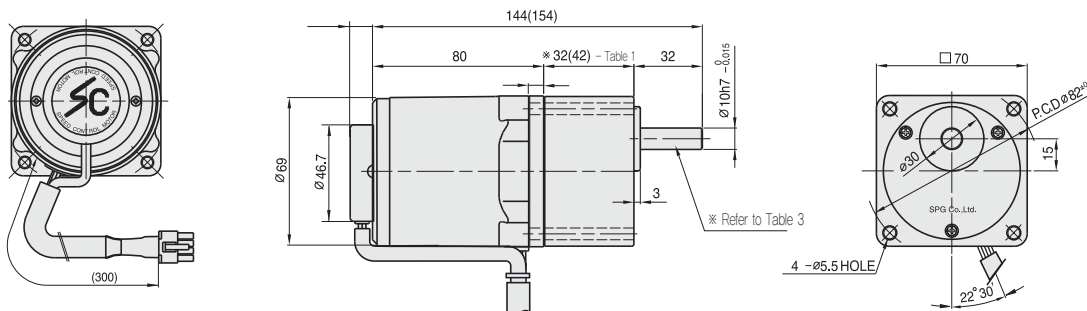
▲ S7I15GX-V12
S7I15GX-V12CE

DIMENSIONS

+ GEARED MOTOR

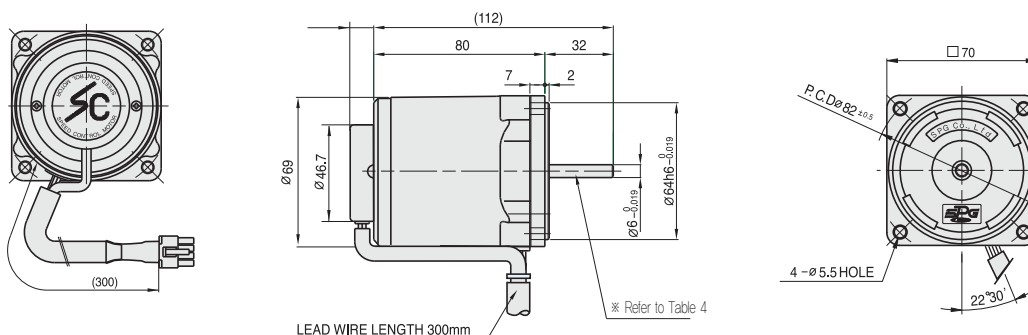
※ MOTOR MODEL : S7I15G□-V12

※ HEAD MODEL : S7□A3□~S7□A200□



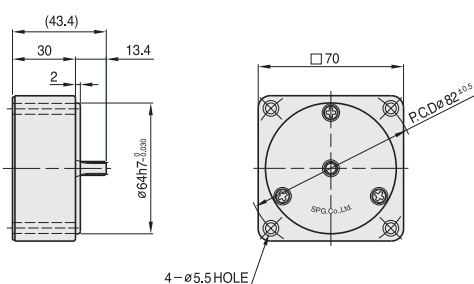
+ MOTOR

※ MOTOR MODEL : S7I15G□-V12



+ INTER-DECIMAL GEAR HEAD

※ MODEL : S7GX10B



+ KEY SPEC

GEAR HEAD	

+ ※26(35) - (Table1)

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

+ WEIGHT - (Table2)

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
GEAR HEAD	S7□A50□ ~ S7□A200□
	0.52

+ SPEC for output shaft of gearhead - (Table3)

MODEL	TYPES OF OUTPUT SHAFT
STRAIGHT TYPE	
S7SA3□ ~ S7SA200□	
D-CUT TYPE	
S7DA3□ ~ S7DA200□	
KEY TYPE	
S7KA3□ ~ S7KA200□	

+ SPEC for output shaft of motor - (Table4)

MODEL	TYPES OF OUTPUT SHAFT
GEAR TYPE	
S7I15G□-V12	
STRAIGHT TYPE	
S7I15S□-V12	
D-CUT TYPE	
S7I15D□-V12	



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. (μF)
									at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
80	S8I15GA-V12 S8I15GA-V12(TP) S8I15GA-V12CE	SUA15IA-V12	4	15	1 ∅ 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	SUA15IB-V12	4	15	1 ∅ 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	SUA15IC-V12	4	15	1 ∅ 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	SUA15ID-V12	4	15	1 ∅ 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	SUA15IX-V12	4	15	1 ∅ 220	50	Cont.	90-1400	1.20	0.120	0.35	0.035	0.55	0.055	1.0
					1 ∅ 240				1.40	0.140	0.35	0.035	0.60	0.060	

- ❖ 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.

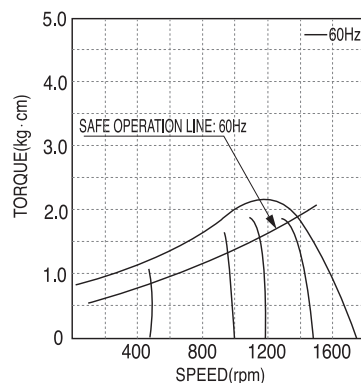
50Hz

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
S8KA□B	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
	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	7.840

60Hz

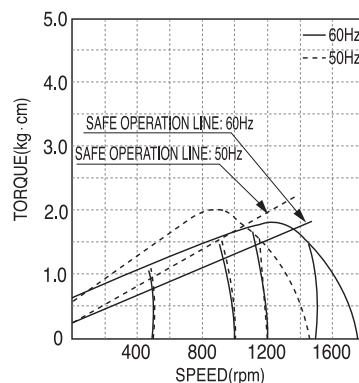
GEAR RATIO		3	3.6	5	6	7.5	9	10	12.5	15	18	20	25	30	36	40	50	60	75	90	100	120	150	180	200
MODEL	rpm	600	500	360	300	240	200	180	144	120	100	90	72	60	50	45	36	30	24	20	18	15	12	10	9
S8KA□B	kg-cm	2.9	3.5	4.9	5.8	7.3	8.7	9.7	12.2	14.6	17.5	17.5	21.9	26.3	31.5	35.0	39.6	47.5	59.4	71.3	79.2	80	80	80	80
	N·m	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	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.



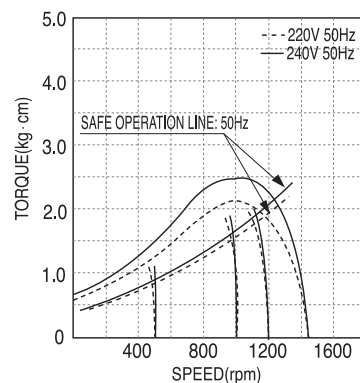
▲ S8I15GA-V12
S8I15GA-V12(TP)
S8I15GA-V12CE

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



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

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



▲ S8I15GX-V12
S8I15GX-V12CE



25W

INDUCTION SPEED CONTROL MOTOR

□ 80mm CONNECTOR TYPE

SIZE mm sq.	Motor Type	Controller Type	Poles	Output	Voltage	Freq.	Duty	Speed Range	Permissible Torque				Starting Torque		Cap.
				(W)	(V)	(Hz)			at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
80	S8I25GA-V12 S8I25GA-V12(TP) S8I25GA-V12CE	SUA25IA-V12	4	25	1 ∅ 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 ∅ 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 ∅ 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 ∅ 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 ∅ 220	50	Cont.	90-1400	1.50	0.150	0.50	0.050	1.00	0.100	1.5
					1 ∅ 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

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
S8KA□B	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
	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

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
S8KA□B	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
	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.

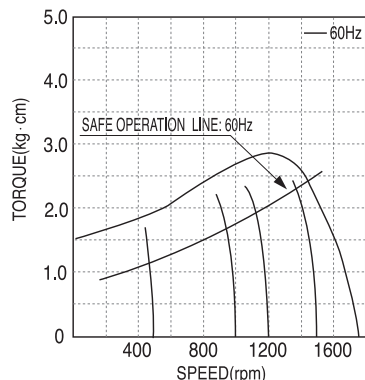
❖ The permissible torque of the motor and inter-decimal gearhead is 80 kg-cm.

❖ ■ 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.

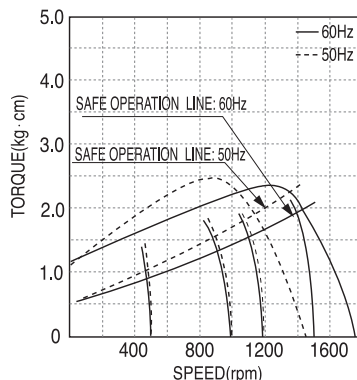
The actual rotation speed can be 2~20% less than displayed value depending on the load.

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



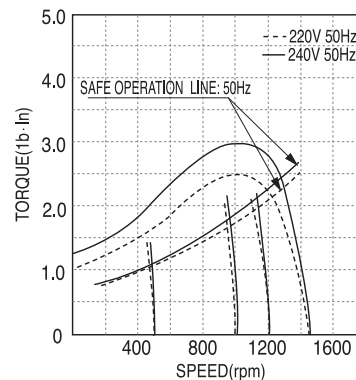
▲ S8I25GA-V12
S8I25GA-V12(TP)
S8I25GA-V12CE

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



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

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



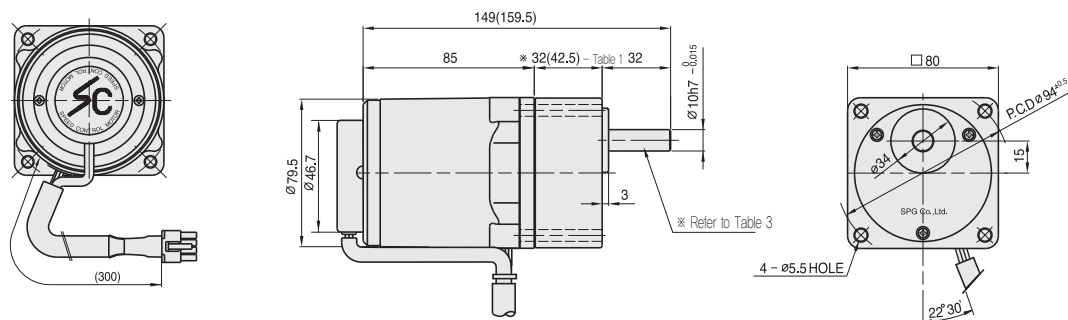
▲ S8I25GX-V12
S8I25GX-V12CE

DIMENSIONS

+ GEARED MOTOR

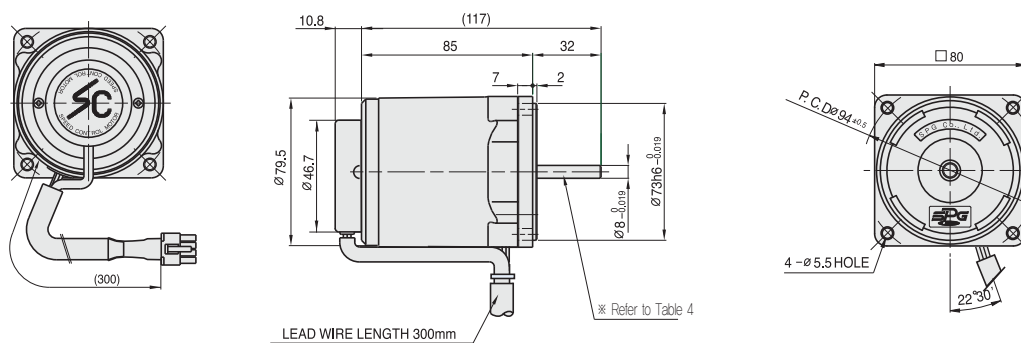
※MOTOR MODEL : S8(15,25)G□-V12

※HEAD MODEL : S8□A3□~S8□A200□



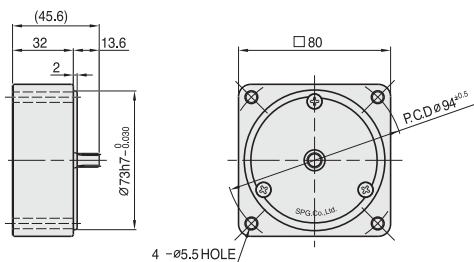
+ MOTOR

※MOTOR MODEL : S8I(15,25)□□-V12



INTER-DECIMAL GEAR HEAD

※MODEL : S8GX10B



+ KEY SPEC

GEAR HEAD	MOTOR

✚ ※26(35) – (Table 1)

GEAR RATIO	SIZE(mm)
S8□A3□ ~ S8□A18□	32
S8□A20□ ~ S8□A200□	42,5

+ WEIGHT – (Table2)

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	
D-CUT TYPE	
KEY TYPE	

➤ SPEC for output shaft of motor – (Table4)

MODEL	TYPES OF OUTPUT SHAFT
GEAR TYPE S8H15G□-V12 S8H25G□-V12	
STRAIGHT TYPE S8H15S□-V12 S8H25S□-V12	
D-CUT TYPE S8H15D□-V12 S8H25D□-V12	
KEY TYPE S8H15K□-V12 S8H25K□-V12	



40W

INDUCTION SPEED CONTROL MOTOR

□ 90mm CONNECTOR TYPE

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

❖ 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	MODEL	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
			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□B()		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
		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

60Hz

GEAR RATIO	MODEL	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
			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□B()		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
		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

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

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

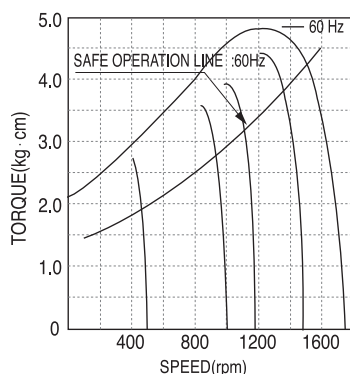
❖ The permissible torque of the motor and inter-decimal gearhead is 100 kg-cm.

❖ 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.

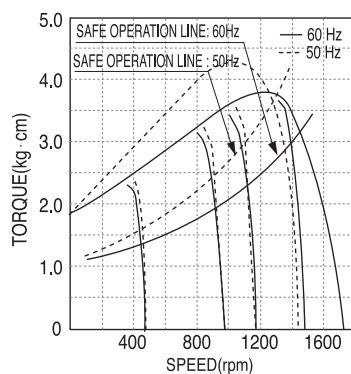
The actual rotation speed can be 2~20% less than displayed value depending on the load.

❖ () is for marking 'L' type or 'H'. 'L' should be used with motor 'L' and 'H' should be used with motor 'H'.



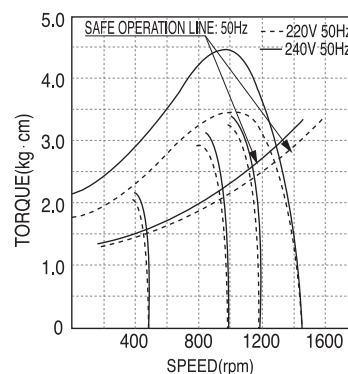
▲ S9I40GA()-V12
S9I40GA()-V12(TP)
S9I40GA()-V12CE

S9I40GB()-V12
S9I40GB()-V12(TP)
S9I40GB()-V12CE



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

S9I40GD()-V12
S9I40GD()-V12(TP)
S9I40GD()-V12CE



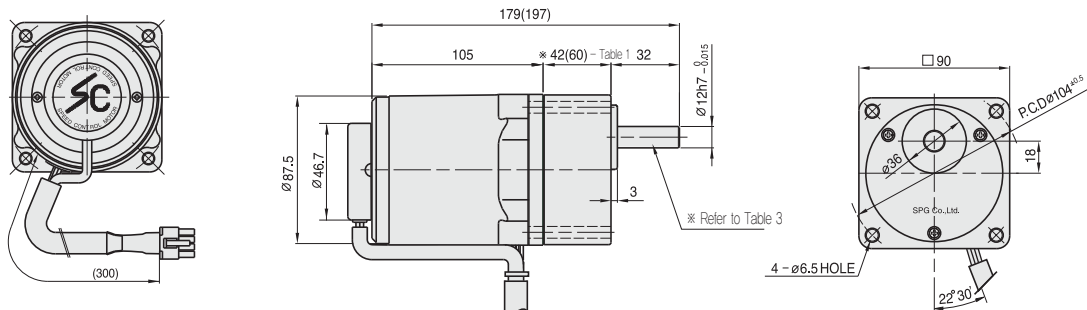
▲ S9I40GX()-V12
S9I40GX()-V12CE

DIMENSIONS

+ GEARED MOTOR

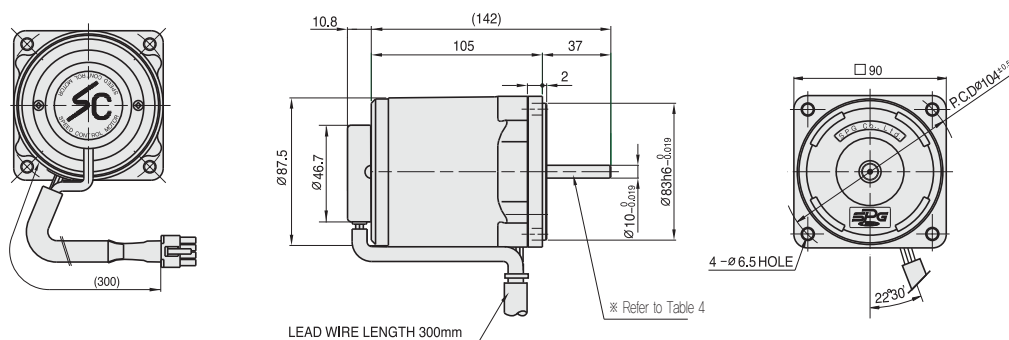
※MOTOR MODEL : S8(15,25)G□-V12

※HEAD MODEL : S8□A3□~S8□A200□



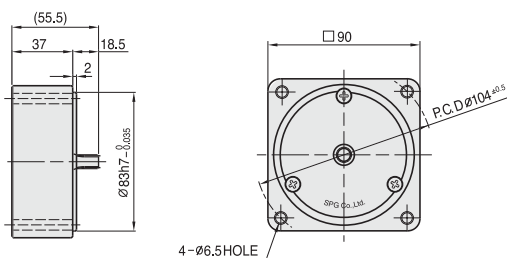
+ MOTOR

※MOTOR MODEL : S8I(15,25)□□-V12



✚ INTER-DECIMAL GEAR HEAD

※MODEL : S8GX10B



+ KEY SPEC

GEAR HEAD	MOTOR

➤ SPEC for output shaft of motor – (Table4)

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)

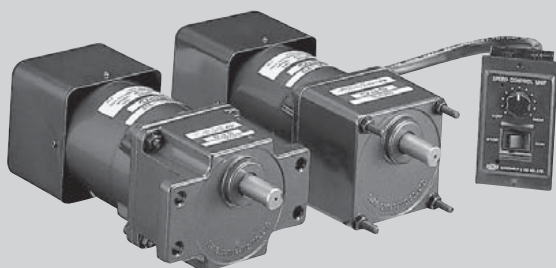
GEAR RATIO	SIZE(mm)
S9□B3□ ~ S9□B18□	42
S9□B20□ ~ S9□B200□	60

+ WEIGHT – (Table2)

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 – (Table3)

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	Voltage	Freq.	Duty	Speed Range	Permissible Torque				Starting Torque		Cap.
				(W)	(V)	(Hz)		(rpm)	at 1200rpm		at 90rpm		(kg-cm)	(N-m)	
90	S9I60GA()-V12 S9I60GA()-V12(TP) S9I60GA()-V12CE	SUA60IA-V12	4	60	1 ∅ 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 ∅ 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 ∅ 100	50	Cont.	90-1400	5.50	0.550	1.20	0.120	4.00	0.400	20.0
						60		90-1700	5.00	0.500					
	S9I60GD()-V12 S9I60GD()-V12(TP) S9I60GD()-V12CE	SUA60ID-V12	4	60	1 ∅ 200	50	Cont.	90-1400	5.50	0.550	1.20	0.120	4.00	0.400	5.0
						60		90-1700	5.00	0.500					
	S9I60GX()-V12 S9I60GX()-V12CE	SUA60IX-V12	4	60	1 ∅ 220	50	Cont.	90-1400	5.20	0.520	0.90	0.090	3.10	0.310	3.5
					1 ∅ 240				5.80	0.580	0.90	0.090	3.60	0.360	

❖ 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	MODEL	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
			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□B()	S9KC□B() -S	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
		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

60Hz

GEAR RATIO	MODEL	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
			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□B()	S9KC□B() -S	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
		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

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

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

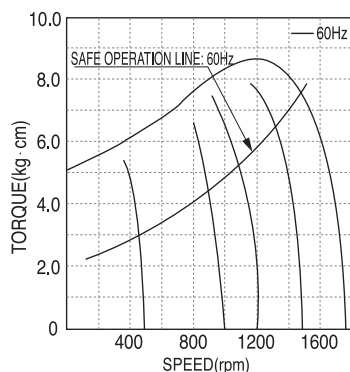
❖ The permissible torque of the motor and inter-decimal gearhead is 200 kg-cm.

❖ 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.

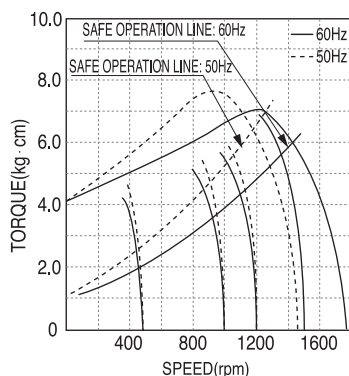
The actual rotation speed can be 2~20% less than displayed value depending on the load.

❖ () is for marking 'L' type or 'H'. 'L' should be used with motor 'L' and 'H' should be used with motor 'H'.



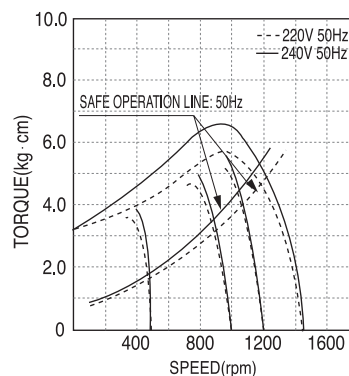
▲ S9I60GA()-V12
S9I60GA()-V12(TP)
S9I60GA()-V12CE

S9I60GB()-V12
S9I60GB()-V12(TP)
S9I60GB()-V12CE



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

S9I60GD()-V12
S9I60GD()-V12(TP)
S9I60GD()-V12CE



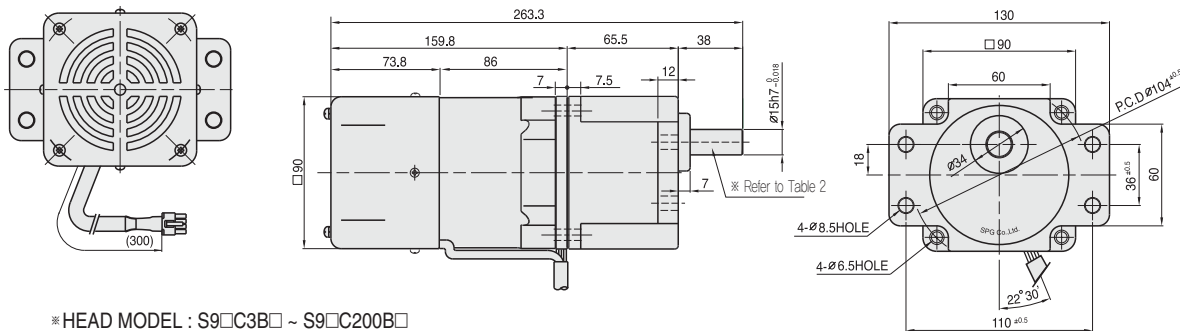
▲ S9I60GX()-V12
S9I60GX()-V12CE

DIMENSIONS

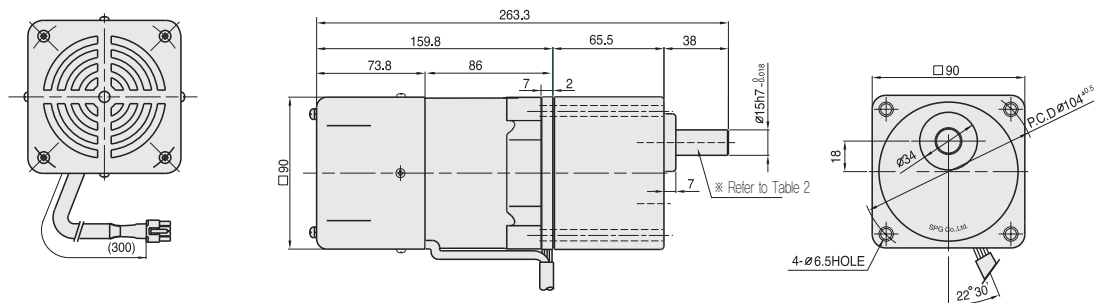
+ GEARED MOTOR

※MOTOR MODEL : S9I60G□□-V12

※ HEAD MODEL : S9□C3B□ ~ S9□C200□-S

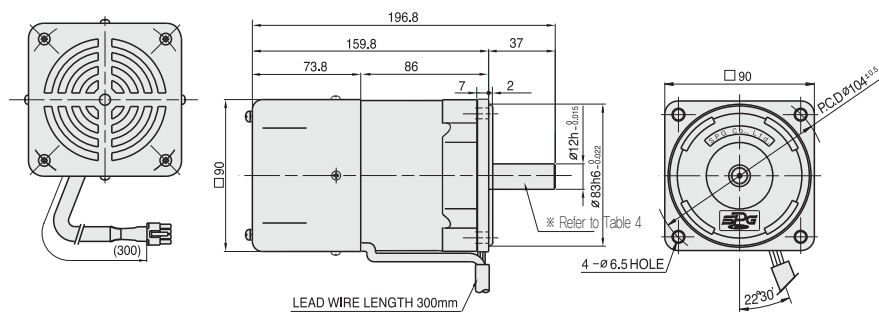


※HEAD MODEL : S9□C3B□ ~ S9□C200B□



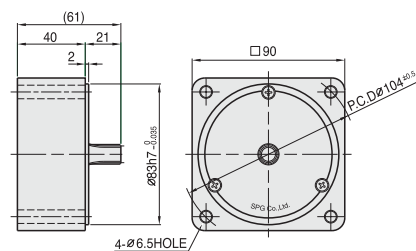
+ MOTOR

※MOTOR MODEL : S9I60□□□-V12



+ INTER-DECIMAL GEAR HEAD

※MODEL : S9GX10B(H,L)-S



+ WEIGHT – (Table 1)

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

+ KEY SPEC

GEAR HEAD		MOTOR	

➤ 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	
S9160G□□-V12	
STRAIGHT TYPE	
S9160S□-V12	
D-CUT TYPE	
S9160D□-V12	
KEY TYPE	
S9160K□-V12	