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# INSTRUCTION MANUAL

for Electric screwdriver / CONTROLLER



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**SEHAN** ELECTOOLS LTD

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### SS. M SERIES

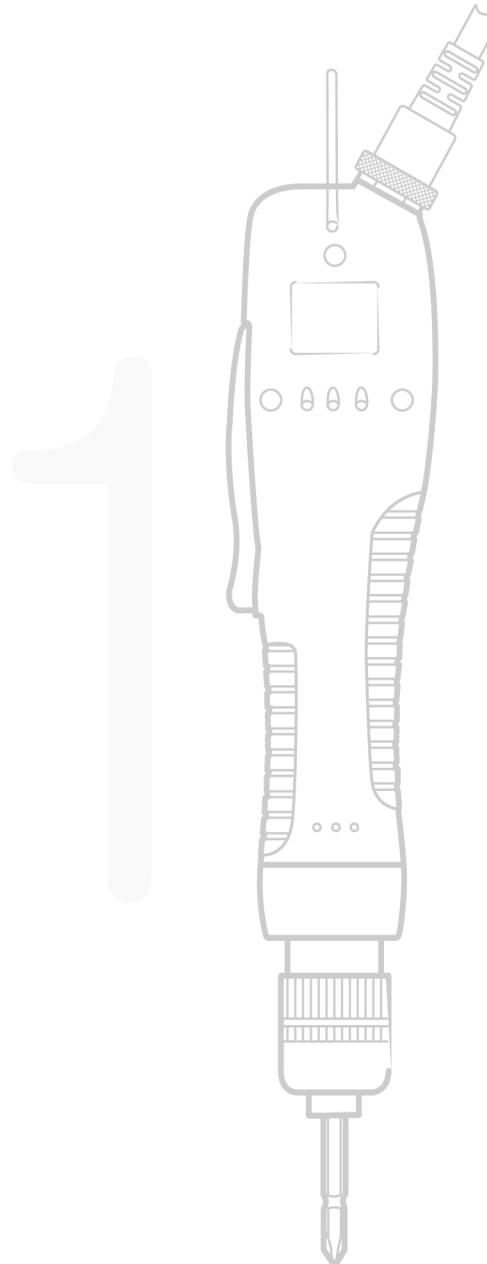
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### EF. K SERIES

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# 1. GENERAL SAFETY RULES

**WARNING! Read and understand all instructions.** Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury

## SAVE THIS INSTRUCTIONS

### 1.1 Work Area

- Keep your work area clean and well lit. Cluttered benches and dark areas invite accidents.
- Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Power tools create sparks which may ignite the dust or fumes.
- Keep bystanders, children, and visitors away while operating a power tool. Distractions can cause you to lose control.

### 1.2 Electrical Safety

- Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. If the tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
- Avoid body contact with grounded surface ad pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is grounded.
- Don't expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock
- Do not abuse the cord. Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately. Damaged cords increase the risk of electric shock.
- When operating a power tool outside, use an outdoor extension cord marked W-A or W. These cords are rated for outdoor use and reduce the risk of electric shock.

### 1.3 Personal Safety

- Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating power tools may result in serious personal injury.
- Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts. Loose clothes, jewelry, or long hair can be caught in moving parts.
- Avoid accidental starting. Be sure switch is off before plugging in. Carrying tools with your finger on the switch or plugging in tools may result in personal injury.
- Remove adjusting keys or switches before turning the tool on. A wrench or a key that is left attached to a rotating part of the tool may result in personal injury.

- Do not overreach. Keep proper footing and balance at all times. Proper footing and balance enables better control of the tool in unexpected situations.
- Use safety equipment. Always wear eye protection. Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

### 1.4 Tool use and Care

- Use clamps or other practical way to secure and support the workplace to a stable platform. Holding the work by hand or against your body is unstable and may lead to loss of control.
- Do not force tool. Use the correct tool for your application. The correct tool will do the job better and safer at the rate for which it is designed.
- Do not use tool if switch does not turn it on or off. Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool. Such preventive safety measures reduce the risk of starting the tool accidentally.
- Store idle tools out of reach of children and other untrained persons. Tools are dangerous in the hands of untrained users.
- Maintain tools with care. Keep cutting tools sharp and clean. Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.
- Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tools operation. If damaged, have the tool serviced before using. Many accidents are caused by poorly maintained tools.
- Use only accessories that are recommended by the manufacturer for your model. Accessories that may be suitable for one tool, may become hazardous when used on another tool.

### 1.5 SERVICE

- Tool service must be performed only by qualified personnel. Service or maintenance performed by unqualified personnel could result in a risk of injury
- When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual. Use of unauthorized parts or failure to follow Maintenance instructions may create a risk of electric shock or injury.

# 2. SPECIFIC SAFETY RULES

**2.1** Hold tool by insulated gripping surfaces when performing an operation where the cutting tool may contact hidden wiring or its own cord. Contact with a "live" wire will make exposed metal parts of the tool "live" and shock the operator.

**2.2** Never lubricate aerosol oil on to the electrical part.

# 1. RÈGLES DE SÉCURITÉ GÉNÉRALÉS

**AVERTISSEMENT !** Vous devez lire et comprendre toutes les instructions. Le non-respect, même partiel, des instructions ci-après entraîne un risque de choc électrique, d'incendie et/ou de blessures graves

## CONSERVEZ CES INSTRUCTIONS

### 1.1 Aire de travail

- Veillez à ce que l'aire de travail soit propre et bien éclairée. Le désordre et le manque de lumière favorisent les accidents.
- N'utilisez pas d'outils électriques dans une atmosphère explosive, par exemple en présence de liquides, de gaz ou de poussières inflammables. Les outils électriques créent des étincelles qui pourraient enflammer les poussières ou les vapeurs.
- Tenez à distance les curieux, les enfants et les visiteurs pendant que vous travaillez avec un outil électrique. Ils pourraient vous distraire et vous faire une fausse manoeuvre.

### 1.2 Sécurité électrique

- Les outils mis à la terre doivent être branchés dans une prise de courant correctement installée et mise à la terre conformément à tous les codes et règlements pertinents. Ne modifiez jamais la fiche de quelque façon que ce soit, par exemple en enlevant la broche de mise à la terre. N'utilisez pas d'adaptateur de fiche. Si vous n'êtes pas certain que la prise de courant est correctement mise à la terre, adressez-vous à un électricien qualifié. En cas de défaillance ou de défectuosité électrique de l'outil, une mise à la terre offre un trajet de faible résistance à l'électricité qui autrement risquerait de traverser l'utilisateur.
- Évitez tout contact corporel avec des surfaces mises à la terre (tuyauterie, radiateurs, cuisinières, réfrigérateurs, etc.). Le risque de choc électrique est plus grand si votre corps est en contact avec la terre.
- N'exposez pas les outils électriques à la pluie ou à l'eau. La présence d'eau dans un outil électrique augmente le risque de choc électrique.
- Ne maltraitez pas le cordon. Ne transportez pas l'outil par son cordon et ne débranchez pas la fiche en tirant sur le cordon. N'exposez pas le cordon à la chaleur, à des huiles, à des arêtes vives ou à des pièces en mouvement. Remplacez immédiatement un cordon endommagé. Un cordon endommagé augmente le risque de choc électrique.
- Lorsque vous utilisez un outil électrique à l'extérieur, employez un prolongateur pour l'extérieur marqué "W-A" ou "W". Ces cordons sont faits pour être utilisés à l'extérieur et réduisent le risque de choc électrique.

### 1.3 Sécurité des personnes

- Restez alerte, concentrez-vous sur votre travail et faites preuve de jugement. N'utilisez pas un outil électrique si vous êtes fatigué ou sous l'influence de drogues, d'alcool ou de médicaments. Un instant d'inattention suffit pour entraîner des blessures graves.
- Habillez-vous convenablement. Ne portez ni vêtements flottants ni bijoux. Confinez les cheveux longs. N'approchez jamais les cheveux, les vêtements ou les gants des pièces en mouvement. Des vêtements flottants, des bijoux ou des cheveux longs risquent d'être happés par des pièces en mouvement.
- Méfiez-vous d'un démarrage accidentel. Avant de brancher l'outil, assurez-vous que son interrupteur est sur ARRÊT. Le fait de transporter un outil avec le doigt sur la détente ou de brancher un outil dont l'interrupteur est en position MARCHE peut mener tout droit à un accident.
- Enlevez les clés de réglage ou de serrage avant de démarrer l'outil. Une clé laissée dans une pièce tournante de l'outil peut provoquer des blessures.
- Ne vous penchez pas trop en avant. Maintenez un bon appui et restez en équilibre en tout temps. Une bonne stabilité vous permet de mieux réagir à une situation inattendue.
- Utilisez des accessoires de sécurité. Portez toujours des lunettes ou une visière. Selon les conditions, portez aussi un masque antipoussière, des bottes de sécurité antidérapantes, un casque protecteur et/ou un appareil antibruit.

### 1.4 Utilisation et entretien des outils

- Immobilisez le matériau sur une surface stable au moyen de brides ou de toute autre façon adéquate. Le fait de tenir la pièce avec la main ou contre votre corps offre une stabilité insuffisante et peut amener un dérapage de l'outil.
- Ne forcez pas l'outil. Utilisez l'outil approprié à la tâche. L'outil correct fonctionne mieux et de façon plus sécuritaire. Respectez aussi la vitesse de travail qui lui est propre.
- N'utilisez pas un outil si son interrupteur est bloqué. Un outil que vous ne pouvez pas commander par son interrupteur est dangereux et doit être réparé.
- Débranchez la fiche de l'outil avant d'effectuer un réglage, de changer d'accessoire ou de ranger l'outil. De telles mesures préventives de sécurité réduisent le risque de démarrage accidentel de l'outil.
- Rangez les outils hors de la portée des enfants et d'autres personnes inexpérimentées. Les outils sont dangereux dans les mains d'utilisateurs novices.
- Prenez soin de bien entretenir les outils. Les outils de coupe doivent être toujours bien affûtés et propres. Des outils bien entretenus, dont les arêtes sont bien tranchantes, sont moins susceptibles de coincer et plus faciles à diriger.

- Soyez attentif à tout désalignement ou coincement des pièces en mouvement, à tout bris ou à toute autre condition préjudiciable au bon fonctionnement de l'outil. Si vous constatez qu'un outil est endommagé, faites-le réparer avant de vous en servir. De nombreux accidents sont causés par des outils en mauvais état.
- N'utilisez que des accessoires que le fabricant recommande pour votre modèle d'outil. Certains accessoires peuvent convenir à un outil, mais être dangereux avec un autre.

## 1.5 RÉPARATION

- La réparation des outils électriques doit être confiée à un réparateur qualifié. L'entretien ou la réparation d'un outil électrique par un amateur peut avoir des conséquences graves.
- Pour la réparation d'un outil, n'employez que des pièces de rechange d'origine. Suivez les directives données à la section " Réparation " de ce manuel. L'emploi de pièces non autorisées ou le non-respect des instructions d'entretien peut créer un risque de choc électrique ou de blessures.

## 2. RÉGLE DE SÉCURITÉ PARTICULIÈRE

- 2.1 Tenez l'outil par ses surfaces de prise isolées pendant toute opération où l'outil de coupe pourrait venir en contact avec un câblage dissimulé ou avec son propre cordon. En cas de contact avec un conducteur sous tension, les pièces métalliques à découvert de l'outil transmettraient un choc électrique à l'utilisateur
- 2.2 Never lubricate aerosol oil on to the electrical part.

# INSTRUCTION MANUAL

## ELECTRIC SCREWDRIVER

**DIRECT PLUG IN** [MODEL]

SS180 / SS250 / SS180P / SS250P  
SS181 / SS251 / SS181P / SS251P  
M300



KTC HH08010-4003C  
KTC HH08010-4004C  
KTC HH08001-4001B

CE marks are approved for the models SS180, SS180P, SS250, SS250P according to the European standards by RWTUV

## 3. MODELS & SPECIFICATIONS

### 3.1 Electrical specification

Rated input voltage	110VAC 35W	SS181, SS181P, SS251, SS251P
	220VAC 40W	SS180, SS180P, SS250, SS250P, M300
Intermittent operation	10s On 30s Off	
Classification	Class I	

- V (Voltage), AC (Alternating Current), W (Watt), s (Seconds)

### 3.2 Mechanical specification

MODEL		Start	Screw Capacity	Torque Kgf.cm	Speed	Weight	Bit Socket
220VAC	120VAC						
SS180	SS181	Lever	M1.4 ~ M4	1.0 ~ 18	1,000	0.56Kg	A:Hex. 1/4" B:Hex.5mm
M300			M2 ~ M4	4.0 ~ 18			
SS250	SS251	Push	M1.7 ~ M5	4.5~25	630		
SS180P	SS181P		M1.4 ~ M4	2.5 ~ 18	1,000		
SS250P	SS251P		M1.7 ~ M5	2.5 ~ 25	630		

- The above data can be changed without notice for the quality improvement
- Standard packing include two(2) carbon brush, two(2) philips type bits, Torque spring and the instruction manual.
- For the bit socket, please add the suffix A or B to the model no.

### 3.3 Torque curve of each model

See the torque curve at the page 27

### 3.4 Way to Change Bit

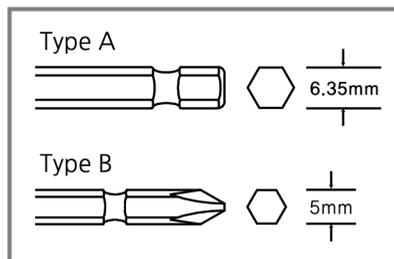


When inserting bit into push type driver, insert the bit while pulling the section marked O in the direction of the arrow.



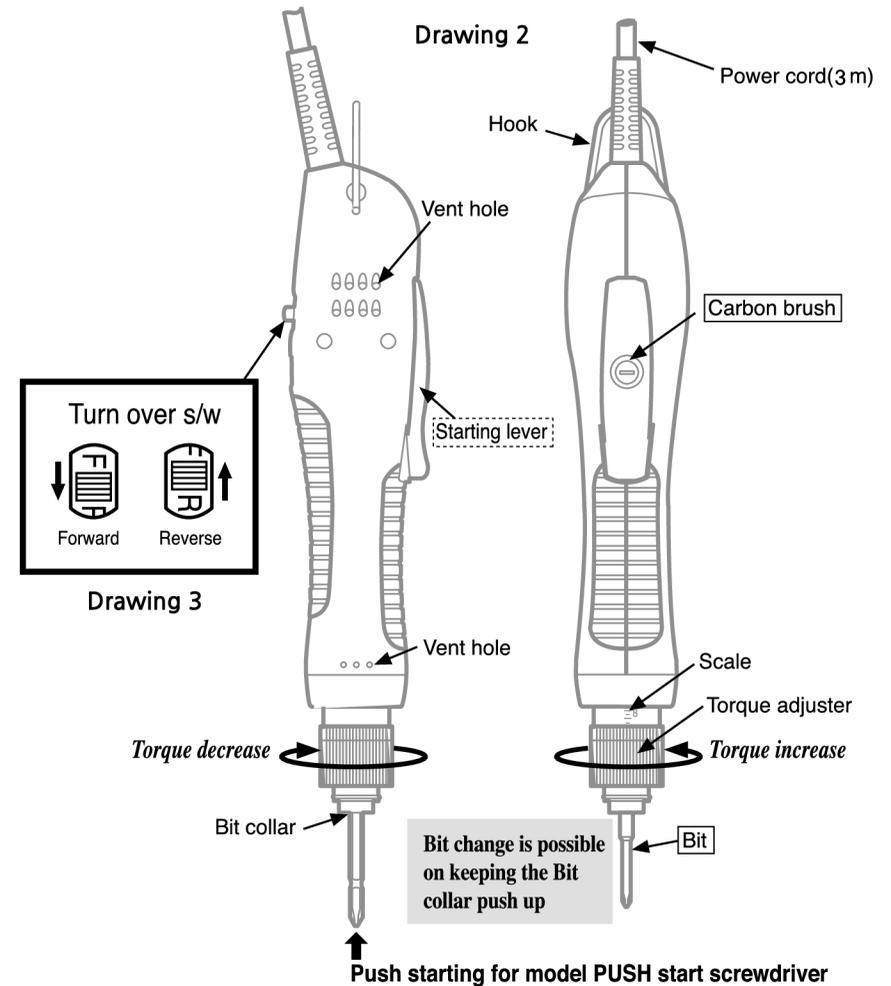
Lever-type insert the bit pushing in the opposite direction.

### 3.5 Type of bit



Drawing 1

## 4. FUNCTIONAL DESCRIPTION



- You can change Torque spring if you solve Torque adjuster as shown in the above completely

Power cord	3M	Screwdriver stands by on plug in the power cord
Start switc	Lever	by pushing the Lever, screwdriver start running
	Push	by pushing the bit, screwdriver start running
Turn over switch		For direction of rotation
Torque adjuster		Adjust the torque set
Bit		Consumptive accessories

## 5. OPERATION

Operating procedure of the tool is as follows.

### 5.1 Bit insert

When insert bit to push type driver, insert bit during pulling. Bit is hard fixed when you put bit collar. When insert bit to push type driver, insert bit during pushing. Bit is hard fixed when you put bit collar.

### 5.2 Torque setting

By rotating the Torque adjuster up and down, the target fastening torque can be adjusted and set on the scale. 3.3 Torque curves help for torque setting as a guidance. The torque curve shown on the 3.3 drawing can be changed according to the aging.

### 5.3 Selecting direction of rotation

Slide the 2 position turn over switch down or up, and set the position of direction, Forward and Reverse shown on the drawing 3.

### 5.4 Power cord connection

On connecting power cord, the screwdriver is ready for working of screw fastening. Always keep the power cord connection off during not use it.

### 5.5 Starting

Keep pressing the Lever in Lever-start type or pushing the bit in Push-start type, the bit start rotating. Seize the grip enough against the reaction of the torque.

### 5.6 Torque control

As soon as the load reach the set torque, the screwdriver stop automatically with the SS series and the clutch of the screwdriver slip automatically with the M series till releasing the Lever or the Bit.

### 5.7 Reset

Releasing the Lever in Lever-start type or the Bit in Push-start type, the screwdriver return to the stand by situation.

### 5.8 Torque testing

Use the torque tester for testing the output torque of the screwdrivers.

### 5.9 Torque applied to the screw

The output torque of the screwdriver does not mean the fastening torque of the screw. Same torque applied to the screws can make different fastening torque according to the various fastening factors as like the friction, type of joint, material of work pices and so on.

### 5.10 Intermittent operation

The screwdriver is designed for intermittent operation, 10 seconds On / 30 seconds Off period cycle. This intermittent operation should be kept in using.

### 5.11 Normal load

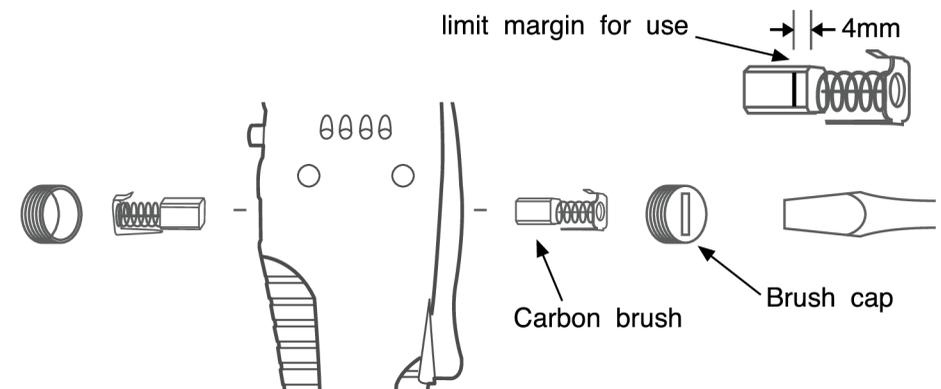
The screwdriver is designed for using the normal load . However the screwdriver should not be used with the load over the rated input.

## 6. MAINTENANCE

**6.1** To avoid the serious damage to the motor, check abrading of the carbon brush periodically

### 6.2 Replacement of the Carbon brush

- Always disconnect the power cord for replacing the Carbon brush.
- Disassemble the Brush cap by loosening by counter clock wise with the slotted driver.
- Pull the carbon brush out with the pin set, and insert the new brush. And then close the brush cap.
- Keep the motor running with no load for approx. one(1) minute for properly seating of the carbon brush.



Drawing 1

### 6.3 Trouble shooting

Trouble	Trouble shooting
The motor does not work	① Check the power cord connection ② Check the carbon brush, and replace it, if necessary
The motor runs intermittently	① Check the carbon brush, and replace it. ② Check the connection of power cable and cord
The motor runs so slowly	① Check the carbon brush, and replace it.
The motor runs so slowly	① Check the torque adjuster position, and compare with the torque curve on drawing no.1 ② Check the carbon brush, and replace it.

## 7. ACCESSORIES

### 7.1 Torque Cover

The torque cover can be used where the unexpected torque adjustment should be protected.



Torque Cover



# INSTRUCTION MANUAL

## ELECTRIC SCREWDRIVER

[MODEL]

EF080 / EF080P

EF120 / EF120P

EF180 / EF180P

K250 / K350 / K450

K250P / K350P / K450P

with ET- 30D, KT- 38D controller



KTC HH08010-4005C

KTC HH08010-4006C

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### 3. MODELS & SPECIFICATIONS

ET-30D controller

+ EF080, EF080P  
EF120, EF120P  
EF180, EF180P

KT-38D controller

+ EF080, EF080P  
EF120, EF120P, EF180, EF180P  
K250, K350, K450  
K250P, K350P, K450P

#### 3.1 Electrical specification

Specification	ET-30D (controller)	KT-38D (controller)
Rated Input - Output voltage	110-230VAC ( Free volt )	110 / 230VAC (Selectable)
Rated Output Voltage	20 / 30VDC ( Low/High )	20/30, 30/38 VDC
Rated Output current- power	1.2A 36W	2.5A 95W
Maximum Output current	2 A	5 A
Intermittent operation	10s On / 30s Off	

- V (Voltage), AC (Alternating Current), W (Watt), s (Seconds)

#### 3.2 Mechanical specification

Model	Screw	Torque Kgf.cm	Speed(RPM)		Weight kg	Bit Socket
			LOW	HIGH		
EF080, EF080P	M1.3~M3.0	1~8	1,000		0.31	A:Hex. 1/4" E:Ø 4mm
EF120, EF120P	M1.3~M3.0	1~12	1,000			
EF180, EF180P	M2.0~M3.1	2~18	630			
K250, K250P	M2.6~M4	3~25	630	1,050	0.6	A:Hex. 1/4" B:Hex.5mm
K350, K350P	M2.6~M5	4~35	460	750		
K450, K450P	M2.6~M6	5~45	330	550		

- The above data can be changed without notice for the quality improvement
- Standard packing include two(2) carbon brushes, two(2) philips type bits, Torque spring and the instruction manual.

#### 3.3 Torque curve of each model

See the torque curve at the page 27~28

#### 3.4 Way to Change Bit



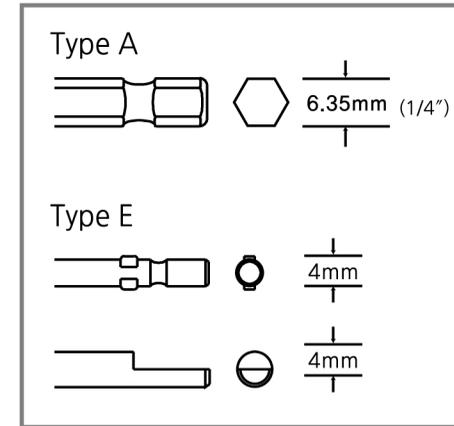
When inserting bit into push type driver, insert the bit while pulling the section marked O in the direction of the arrow.



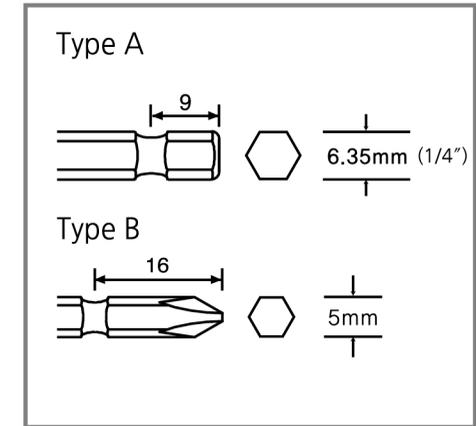
Lever-type insert the bit pushing in the opposite direction.

#### 3.5 Type of bit

■EF



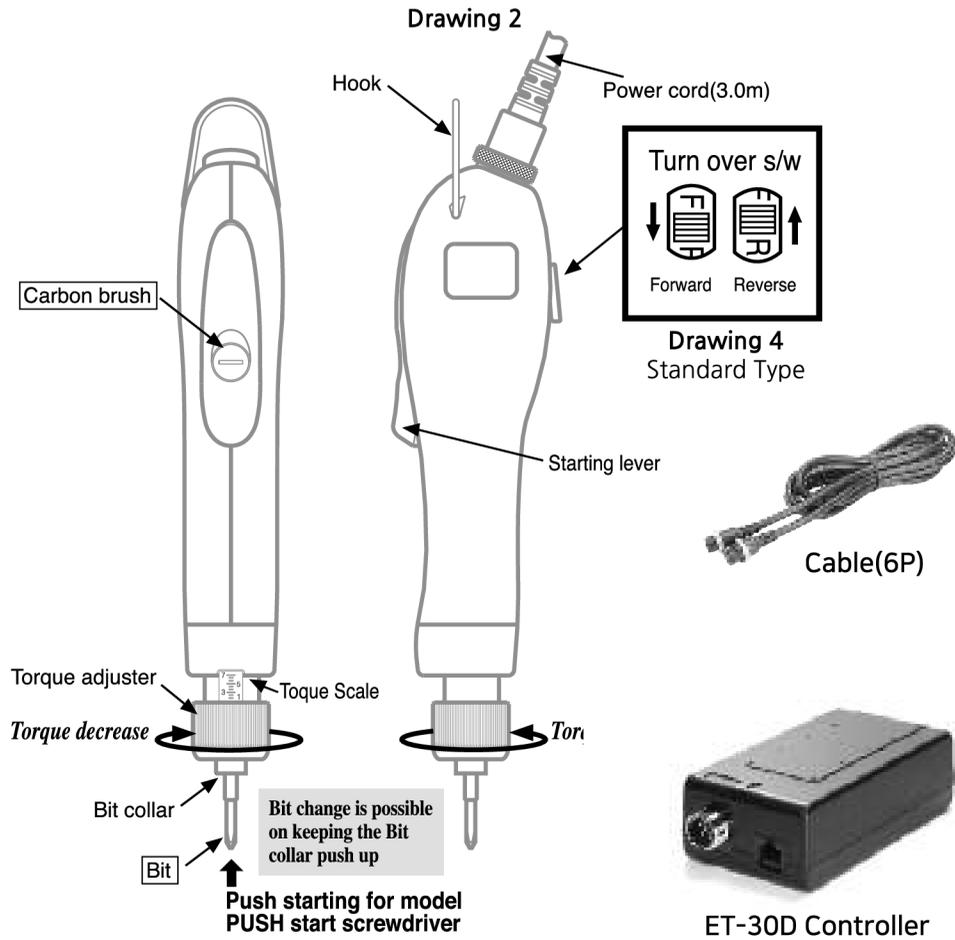
■K



Drawing 1

## 4. FUNCTIONAL DESCRIPTION

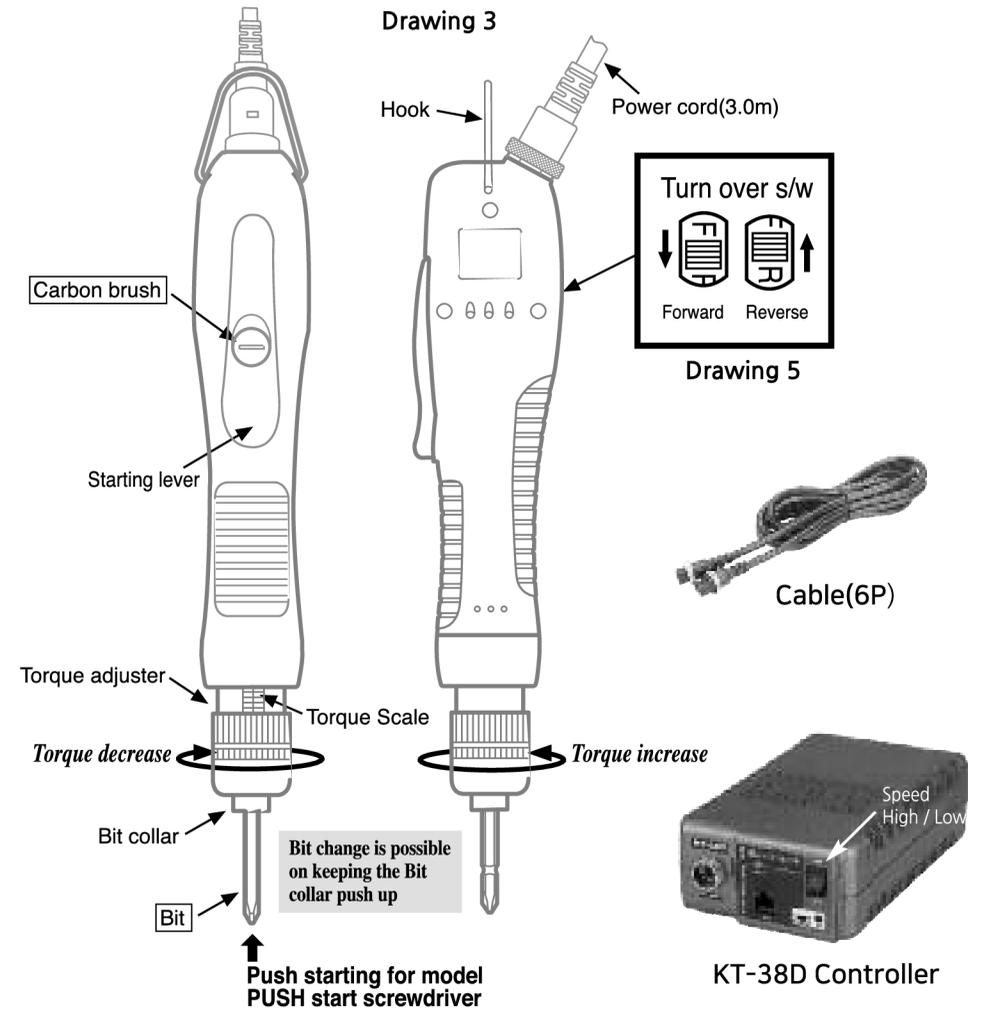
### 4.1 EF080, EF080P, EF120, EF120P, EF180, EF180P



■ You can change Torque spring if you solve Torque adjuster as shown in the above completely

Cable (6p)	6 wire cable - 3M	
Turn over switch	Slide	by sliding the knob, selected rotation direction
	Push	by pushing the knob, selected rotation direction
Turn over switch	by pushing the lever, screwdriver start running	
Torque adjuster	Adjust the torque set	
Bit	Consumptive accessories	

### 4.2 K250, K350, K450



■ You can change Torque spring if you solve Torque adjuster as shown in the above completely

Power cord	6 wire cable - 3M
Start switch	by sliding the knob, selected rotation direction
Turn over switch	by pushing the lever, screwdriver start running
Torque adjuster	Adjust the torque set
Bit	Consumptive accessories

## 5. OPERATION

Operating procedure of the tool is as follows.

### 5.1 Bit insert

When insert bit to push type driver, insert bit during pulling. Bit is hard fixed when you put bit collar. When insert bit to push type driver, insert bit during pushing. Bit is hard fixed when you put bit collar.

### 5.2 Torque setting

By rotating the Troque adjuster up and down, the target fastening torque can be adjusted and set on the scale. 3.3 Torque curve help for torque setting as a guidance. The torque curve shown on the 3.3 drawing can be changed according to the aging.

### 5.3 Selecting direction of rotation

Slide the 2 position turn over switch down or up, and set the position of direction, Forward, and Reverse shown on the drawing 4 and 5.

### 5.4 Power cord connection

On connecting power cord of the controller, the screwdriver is ready for working of screw fastening. **Always keep the power cord connection off during not use it.**

### 5.5 Starting

Keep pressing the Lever in Lever-start type, the bit starts rotating. **Seize the grip enoughly against the reaction of the torque.**

### 5.6 Torque control

As soon as the load reach the set torque, the screwdriver will stop automatically.

### 5.7 Reset

Releasing the Lever in Lever-start type or the Bit in Push-start tyet, the screwdriver return to the stand by situation.

### 5.8 Torque testing

Use the torque tester for testing the output torque of the screwdrivers.

### 5.9 Torque applied to the screw

The output torque of the screwdriver does not mean the fastening torque of the screw. Same torque applied to the screws can make different fastening torque according to the various fastening factors as like the friction, type of joint, material of work pices and so on.

### 5.10 Intermittent operation

The screwdriver is designed for **intermittent operation, 10 seconds On / 30 seconds Off period cycle**. This intermittent operation should be kept in using.

### 5.11 Reverse rotation

- Set the R position of the F/R turn over switch for model EF080 and all K series screwdrivers, and push the lever
- Push the Reverse rotation Knob for the model EF080S

### 5.12 Never use the screwdriver with non specified power transformer or controller.

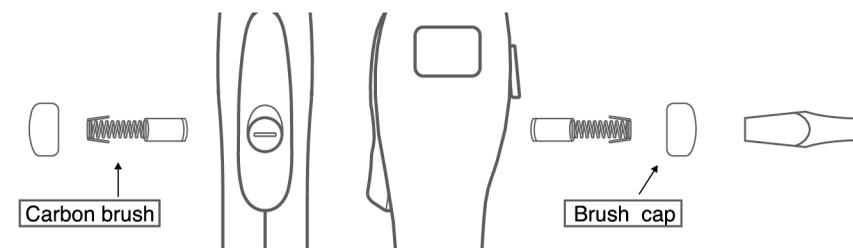
- It may cause electrical risk or injury.

## 6. MAINTENANCE

**6.1** To avoid the serious damage to the motor, check abrading of the carbon brush periodically

### 6.2 Replacement of the Carbon brush

- **Always disconnect the power cord for replacing the Carbon brush.**
- Disassemble the Brush cap by loosening by counter clock wise with the slotted driver.
- Pull the carbon brush out with the pin set, and insert the new brush. And then close the brush cap.
- Keep the motor running with no load for approx. one(1) minute for properly seating of the carbon brush.



Drawing 1

### 6.3 Trouble shooting

Trouble	Trouble shooting
The motor does not work	① Check the power cord connection ② Check the carbon brush, and replace it, if necessary
The motor runs intermittently	① Check the carbon brush, and replace it. ② Check the connection of power cable and cord
The motor runs so slowly	① Check the carbon brush, and replace it.
The output torque is too low	① Check the torque adjuster position, and compare with the torque curve on drawing no.1 ② Check the carbon brush, and replace it.

# INSTRUCTION MANUAL

## ELECTRIC SCREWDRIVER CONTROLLER

KT-38D



KTC HH08010-4006C

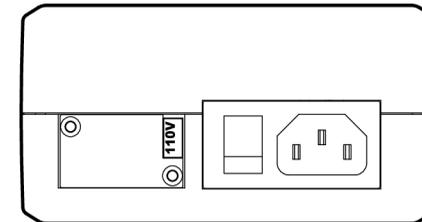
### 3. MODELS & SPECIFICATIONS

Specification	KT-38D
Rated Input - Output voltage	110 / 230VAC (Selectable)
Rated Output Voltage	20/30, 30/38 VDC (Selectable)
Rated Output current- power	2.5A 95W
Maximum Output current	7 A
Intermittent operation	10s On / 30s Off
Electrical Safety	CE certified (Class I)

### 4. MECHANICAL SPECIFICATION

**Dimension** : 90 × 150 × 55H(mm)  
**Weight** : 860gr  
**Power cord** : 1.5M  
**Fuse** : 6.3A 250V

### 5. INPUT VOLTAGE SELECTING



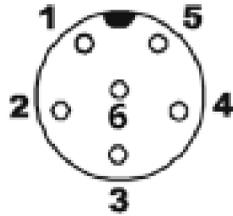
Label on back side

110VAC Selected



220VAC Selected

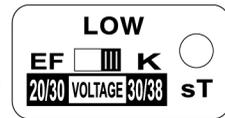
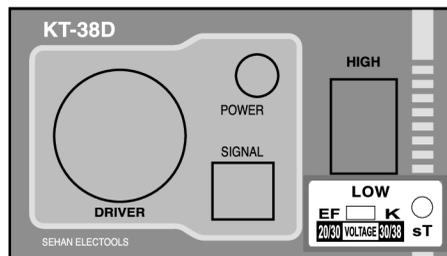
## 6. OUTPUT PIN CONFIGURATION



- 1 : Motor (+)
- 2 : Limit
- 3 : Motor (-)
- 4 : Drive
- 5 : Ground
- 6 : Lock

Cution : Never connect anything not specified.  
It cause fire, electric shock and damage to the controller.

## 7. OUTPUT VOLTAGE SELECTION

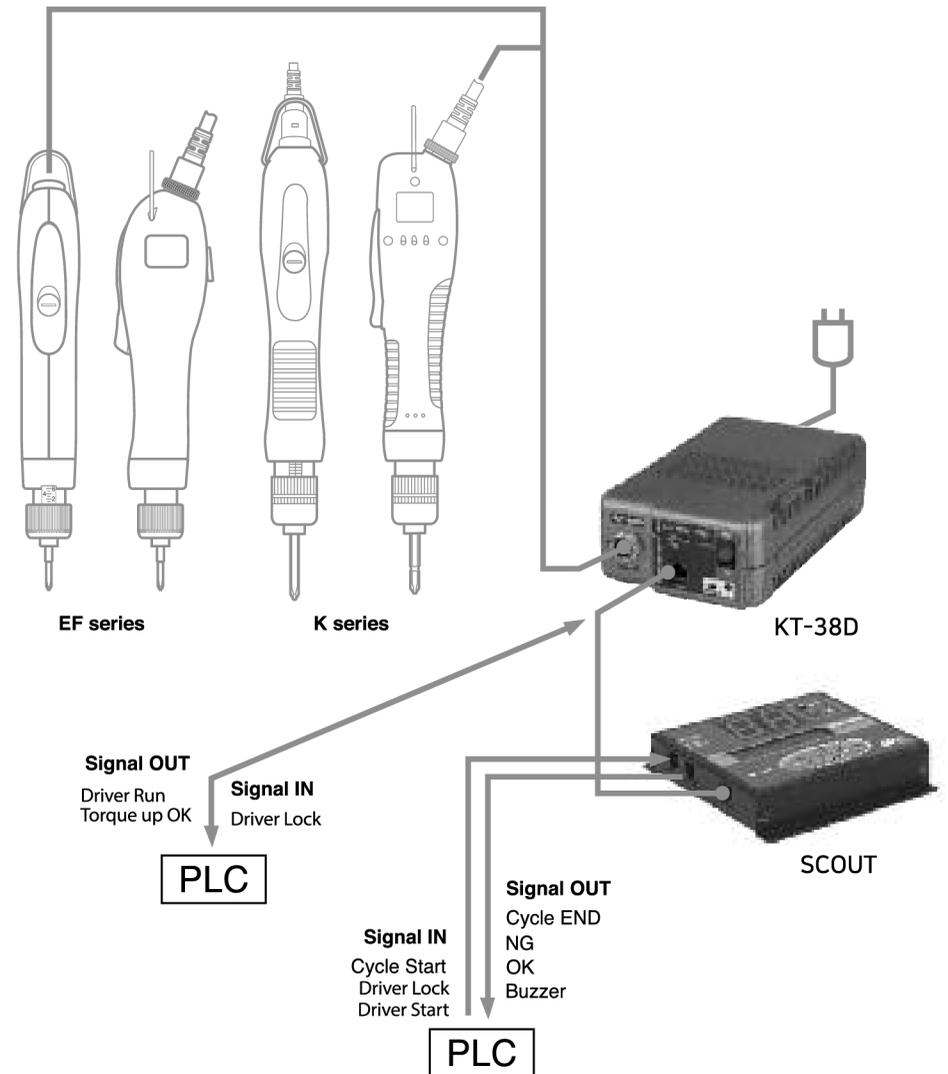


K series (30/38) selected

## 8. SOFT START AND DOUBLE HIT

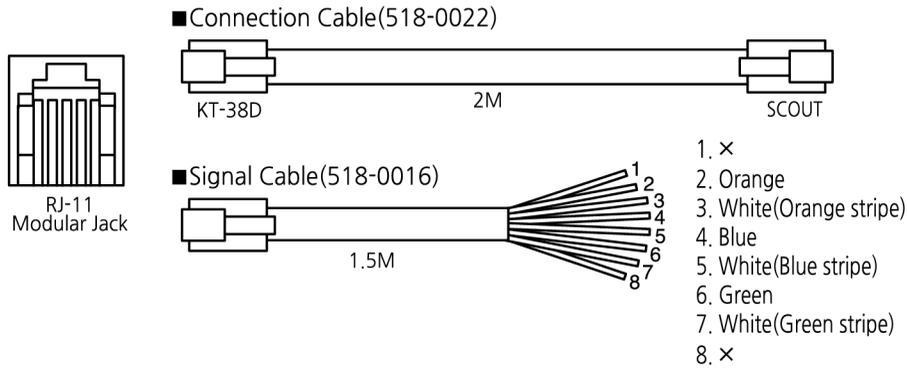
Push sT Button	FUNCTION	LED light
0	Standard	Green
1st	Soft Start during 0.2sec.	Yellow Blink once
2nd	Soft Start during 0.3sec.	Yellow Blink twice
3rd	Soft Start during 0.5sec.	Yellow Blink three times
4th	Soft Start during 0.6sec.	Yellow Blink once four times
5th	Double hit	Red

## 9. CONNECTIONS

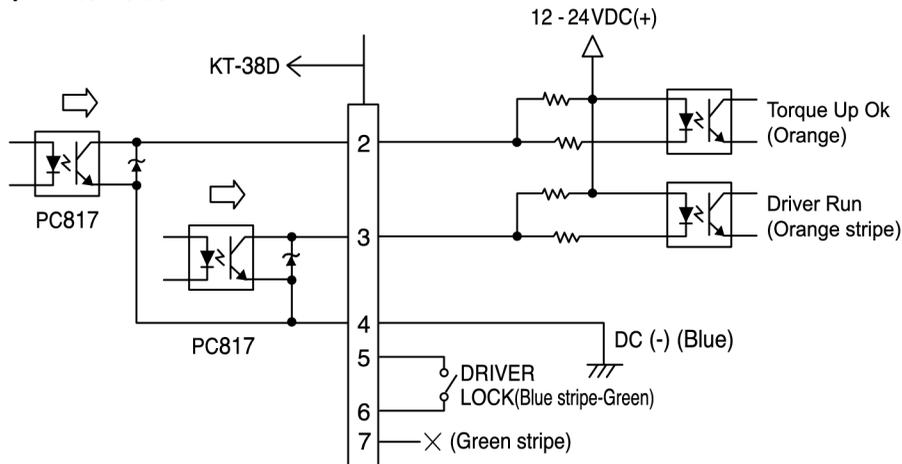


## 10. Interface with KT-38D controller

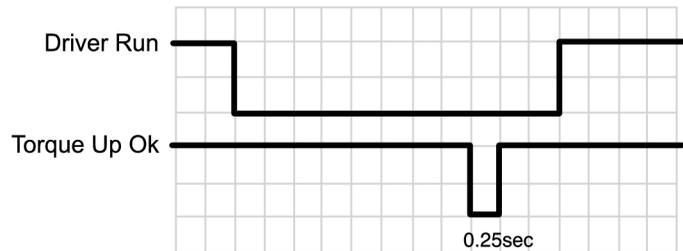
### 10.1 Connector and cables(OPTION)



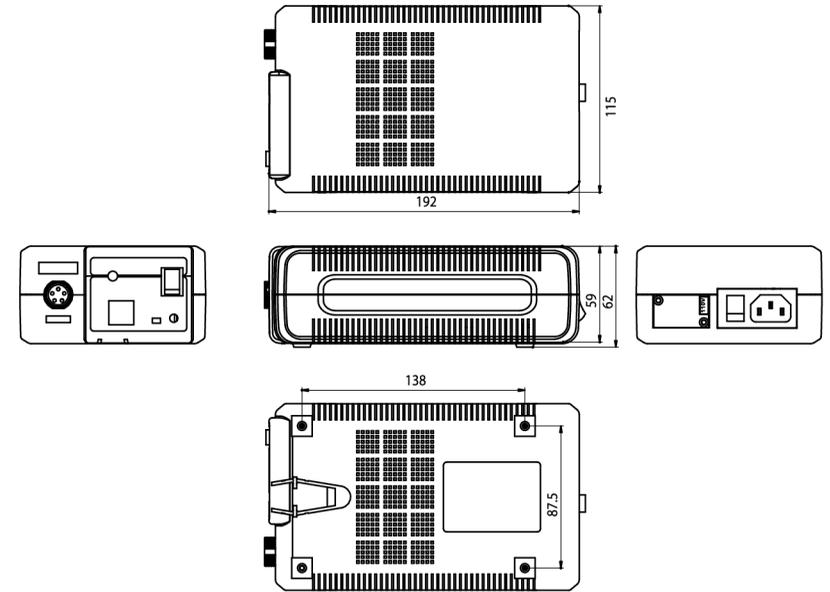
### 10.2 Interface



### 10.3 Timing chart



## 11. INSTALLATION OF CONTROLLER



## 12. SELF PROTECTION OF KT-38D

### OCP(Over Current Protection)

The power will shut down automatically when the current exceeds 12-13A. The controller should be reset by turning off the power switch for one minute and turned back on. If the current is not over the limit, power will turn on.

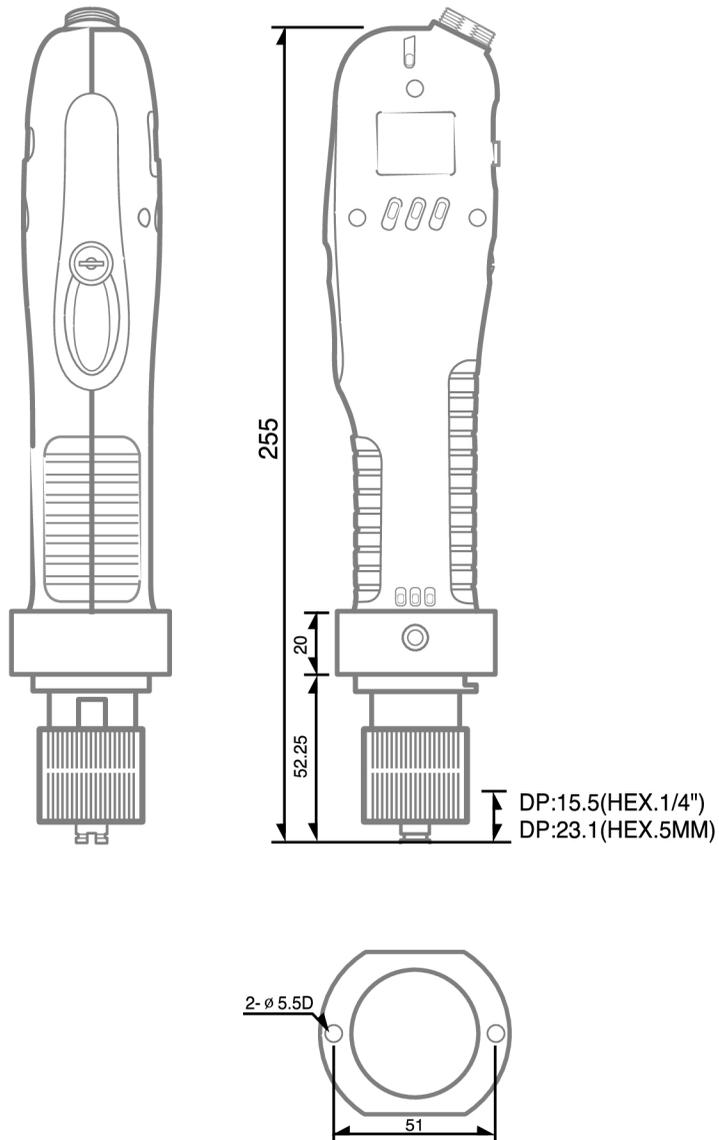
There is another OCP in a secondary circuit. The power will be disappear for 5 seconds when the current is over 4A over 1 second or when current is over 9A over 0.5 seconds. The transformer recovers automatically. The transformer gives an alarm signal by blinking Green and Orange color on the LED lights along with beep buzzer sound.

Description		Primary OCP	Secondary OCP	
Detection	Limit current	12 ~ 13A	Condition A 4A	Condition B 12A
	Time duration	X	1 sec	0.5 sec
Protection		Whole power shuts down permanently	Output power disappears for 5 sec	
Protection Signal	LED	X	Blinking Green-Orange---Off	Blinking Orange---Off
	Buzzer	X	Normal frequent beep On/Off	High frequent beep On/Off
Recovery		Turn off power switch	Auto recovery after 5 sec	

### Over Heat Protection

The thermistor will shut down whole power supply if the unit over heats. The controller should be reset by turning off the power switch for one minute and turned back on. If the current is not over the limit, Power will turn on.

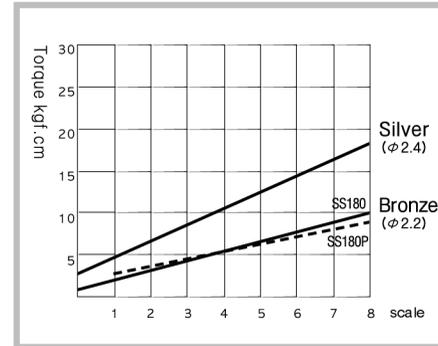
## 13. INSTALLATION OF DRIVER



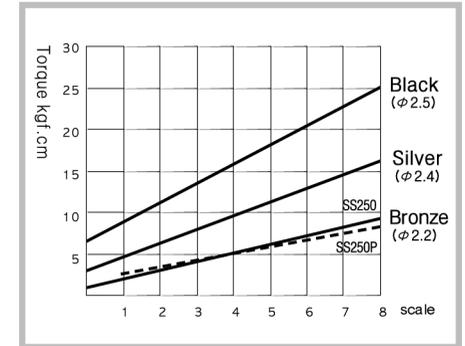
## 14. TORQUE CURVE

Each Torque spring has own torque range as shown in the below  
 For example, Silver implies Silver color Torque spring.  
 The graph in manual is only reference.  
 It is recommended that actual torque value is measured by torque tester.

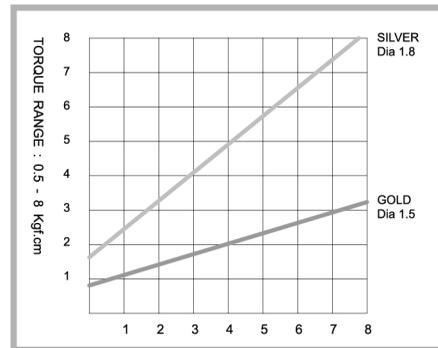
### ■ SS180, SS181, SS180P, SS181P



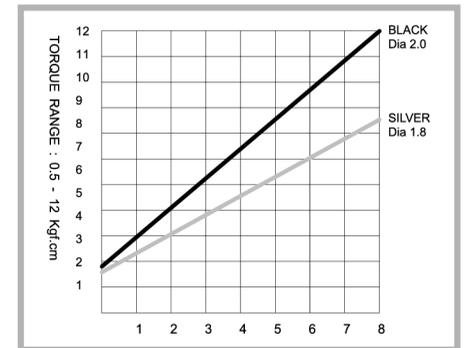
### ■ SS250, SS251, SS250P, SS251P



### ■ EF080, EF080P

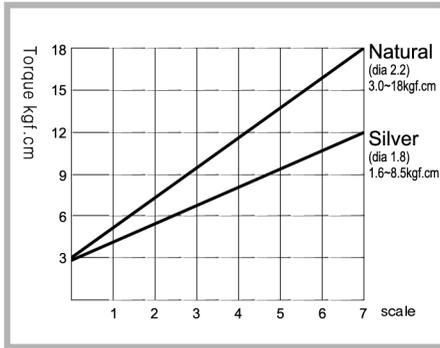


### ■ EF120, EF120P

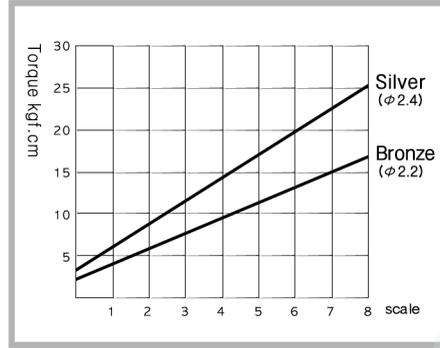


# MEMO

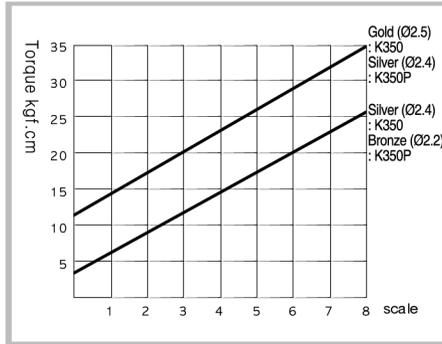
## ■ EF180, EF180P



## ■ K250, K250P



## ■ K350, K350P



## ■ K450, K450P

