



**Transformer with Automatic
Controlled Systems
For Electric Screwdrivers
Operation Manual**

CLT-AY-61, CLT-AY-81

(April, 2018)

HIOS Inc.

<http://www.hios.com>

Operation Manual No. ET-A035

Thank you very much for your purchase the Transformer Model: CLT-AY-61, CLT-AY-81.
Before starting the operation, read this manual to use CLT-AY-61and CLT-AY-81 safely and properly.
This manual should be kept and read always. If in case of trouble, confirm the phenomenon's by This manual and contact us soon.

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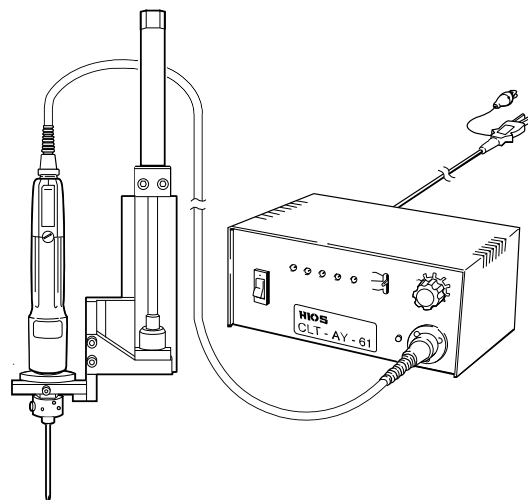
Cautions in Operation

- *Before operating this transformer, read this manual for proper and safety use.
- *Use this transformer under the proper voltage.
- *Use in a well-ventilated place.
- *This transformer must be place in the clean and dry room and kept away from oil, corrosive gas, Interference noise, high voltage unit and the like.
- *Note the lot number and inspection sheet number.
- *Before operation, this transformer must be grounded.
- *Spare transformer in order to avoid the unnecessary rotation of driver
- *Set the proper overtime for tightening screw to work the reset function of the transformer in order to avoid the unnecessary rotation of driver.
- *If the overtime continues, resolve the cause and re-start the unit.
- *When you install the unit, allow some slack for wiring of control terminal or power code.
However, too much slack or unreasonable wiring: ex. binding the power code and signal wires together will be cause of trouble.
- *This unit should be installed in the system where it can be easily seen and removed.
- *Whenever the change of I/O setting or replacement of unit, the power code must be unplugged
And confirmed the safety of all systems. All setting must be same before and after replacement.
- *Use this transformer only for control the **designated automatic driver manufactured by HIOS.**

Note: Never use this for the manual drivers. It may cause trouble.

● For CLT-AY-61 Applicable automatic driver

Model	Driver moldes can be connected
CLF-3000(HH/HN)	1 driver only
CLF-4000 (HH, XH/HN, XN)	
CLF-6000 (HH, XH/HN, XN)	
CLF-6500 (HH, XH/HN, XN)	
CLF-7000 (HH, XH/HN, XN)	
αF-4500 (HH, XH/HN, XN)	
αF-5000 (HH, XH/HN, XN)	
αF-6500 (HH, XH/HN, XN)	

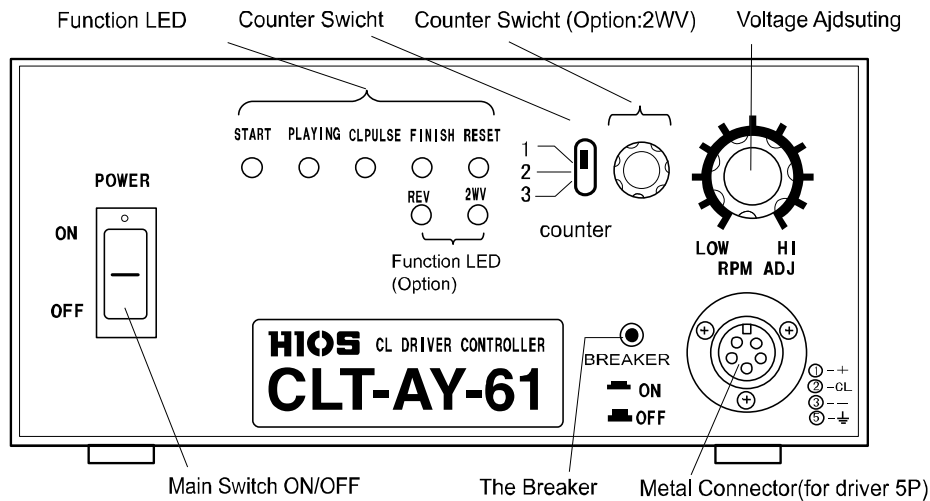


● For CLT-AY-81 Applicable automatic driver

Model	Driver moldes can be connected
CL-816(XH/XN)	1 driver only
CL-825A(XH/XN)	
CL-815A(XH/XN)	

Name of Each Part

- Front Panel (CLT-AY-81 is similar to CLT-AY-61)



Main Switch: ON and OFF AC100, 120V or 220 - 240V Power with is brought to Transformer.

Function Leeds:

START : This lamp turns on while the START signal is input.

PLAYING : This lamp turns on while the START driver rotates.

CL PULSE : This lamp indicates that the pulse signal output when the torque detection SW of driver detects the torque. The rotation of diver will also be stopped by this pulse signal provided to the transformer.

FINISH : This lamp turns on when the screw tightening is finished. And it keeps lighting until the next starting or reset command is executed.

RESET : This lamp turns on while any trouble is occurred on tightening or overtime condition.

*Note; In case that output circuit is short or load is over, CL PULSE and RESET LEDs turn on simultaneously and output to the motor of driver will be stopped. In such case, check the driver.

OPTIONS (Followings are optional specifications.)

2WV : This lamp turns on while the driver works at Low Level of rotation, described at the optional LOW-HI specifications.

REV : This lamp turns on while the driver works at Reverse rotation, described at the optional REV specifications.

COUNTER SW : Number of the impact for completion of tightening is selected

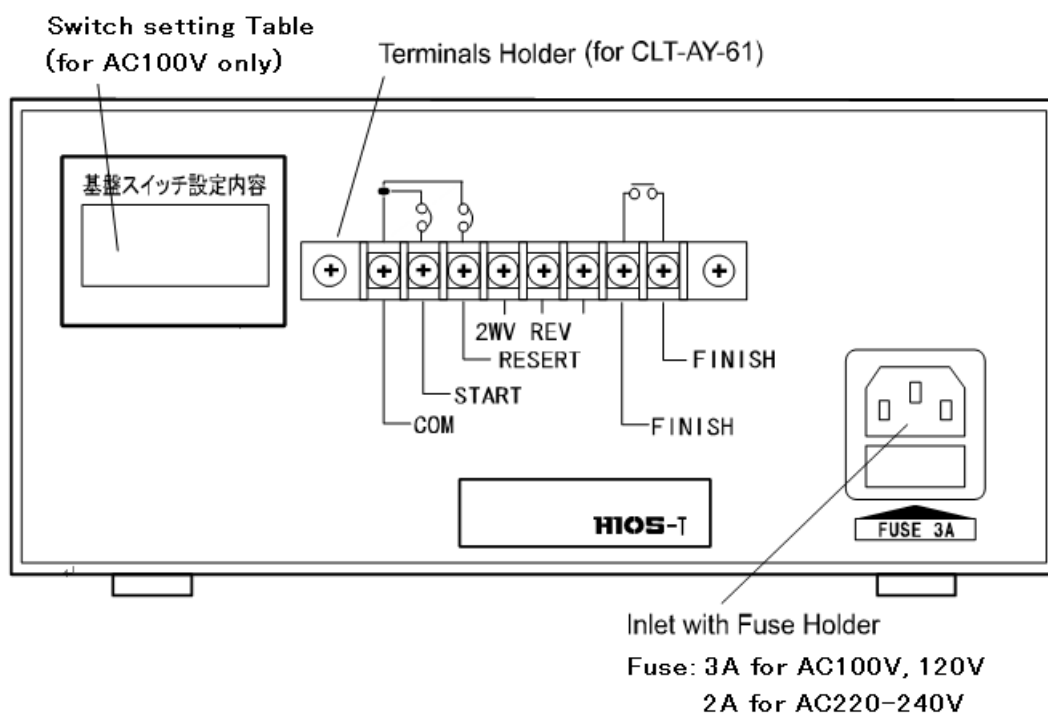
- By this SW; 1= 1 time of impact
- 2= 2 time of impact
- 3= 3 time of impact

Voltage Adjusting

Dial : You can adjust the times of rotation steplessly in a provided range.

Circuit Breaker : This protects the secondary side (driver, circuit) of transformer.

- Rear Panel (Terminal location of CLY-AY-81 is different from CLT-AY-61 but same function)



Terminal : Connect Input and/or Output cables.

Terminal is removable by unscrewing 2 screws at the both end of the terminal.
When you do it, unscrew each of screw little by little.

The table below is the status of switches of the PCB set at HIOS factory.

If you change the setting, refer to the section of “Input/Output setting”

Switch setting table on the internal PCB
(for AC100V only)

		基板上スイッチ設定内容					
		SW101		SW102		SW103	
Factory setting		P	R	XH	XN	VI	OC
工場出荷時		○		○			○
date of change	変更日						
date of change	変更日						
date of change	変更日						

Fuse Holder : 1 each of Fuse and Spare Fuse are installed.

If the Fuse is cut then the lamp of AC Switch and LED lamps do not lit,
replace with Spare Fuse.

Setting of switches on the PCB

Following function can be selectable by changing the SW on built-in circuit PCB inside of CLT-AY-61 or CLT-AY-81.

SW101: You can select the way of starting input: pulse Input (starting is executed by pulse signal) or Reading Starting (the driver rotates only during the input signal is on.)
The Pulse Input starting system is set at the time of delivery.

SW101 is placed toward Rear Panel side (P)--Pulse Input Starting
toward Rear Panel side (R)--Reading Starting

SW102: You can use both types (H type, or N type) of automatic driver manufactured by HIOS.
The delivery time setting is for H type.

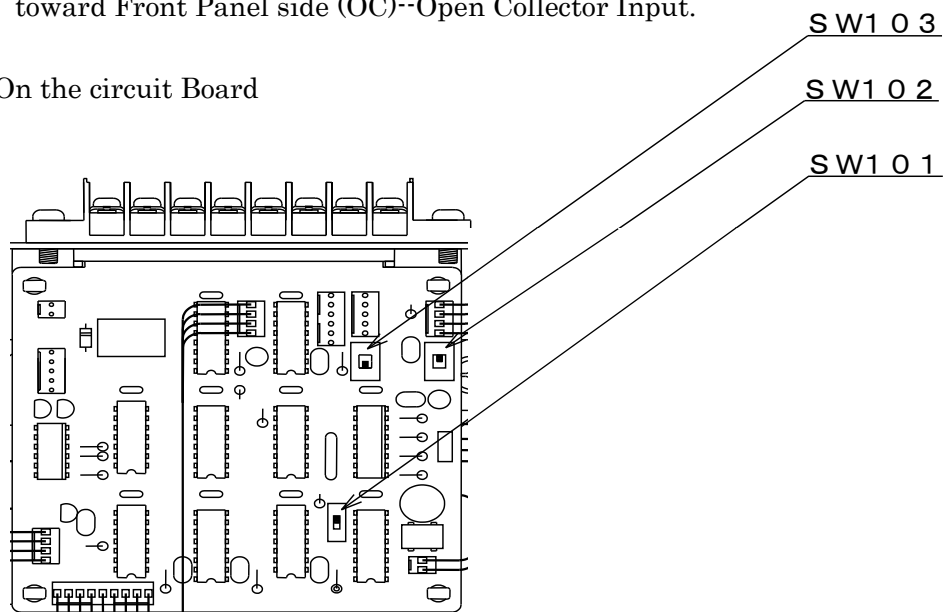
SW102 is placed toward Rear Panel side (XH)--H type (HIOS specification)
toward Front Panel side (XN)--N type (Nittoh specification)

SW103: You can select the way of input: Open collector Input Voltage Input.

The delivery time setting is the open collector Input.

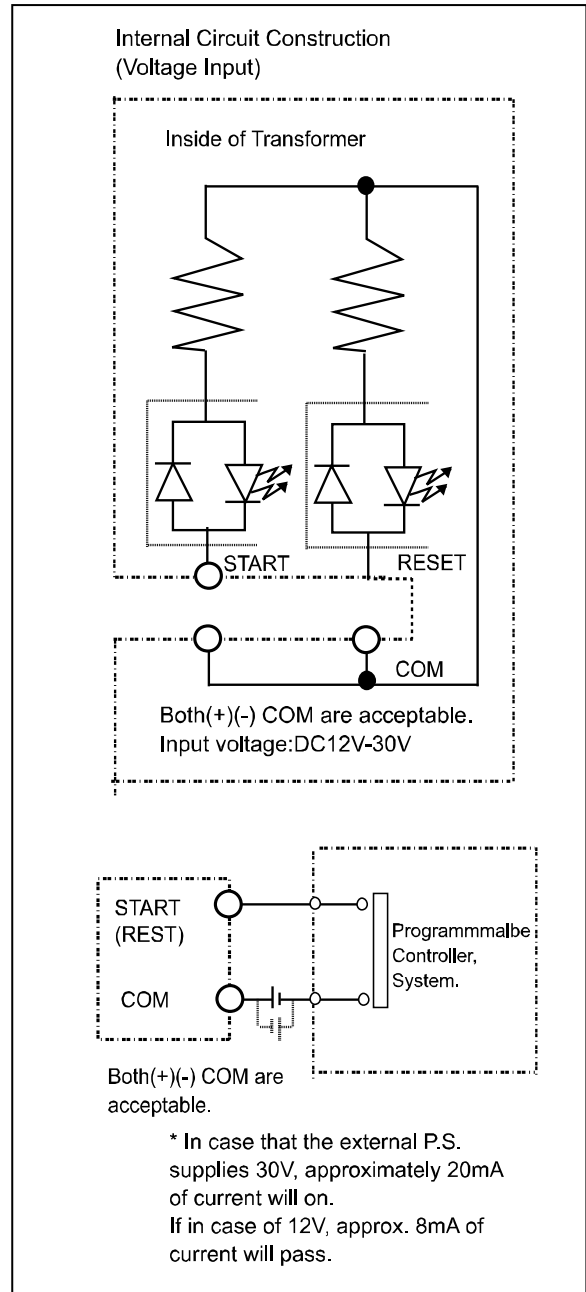
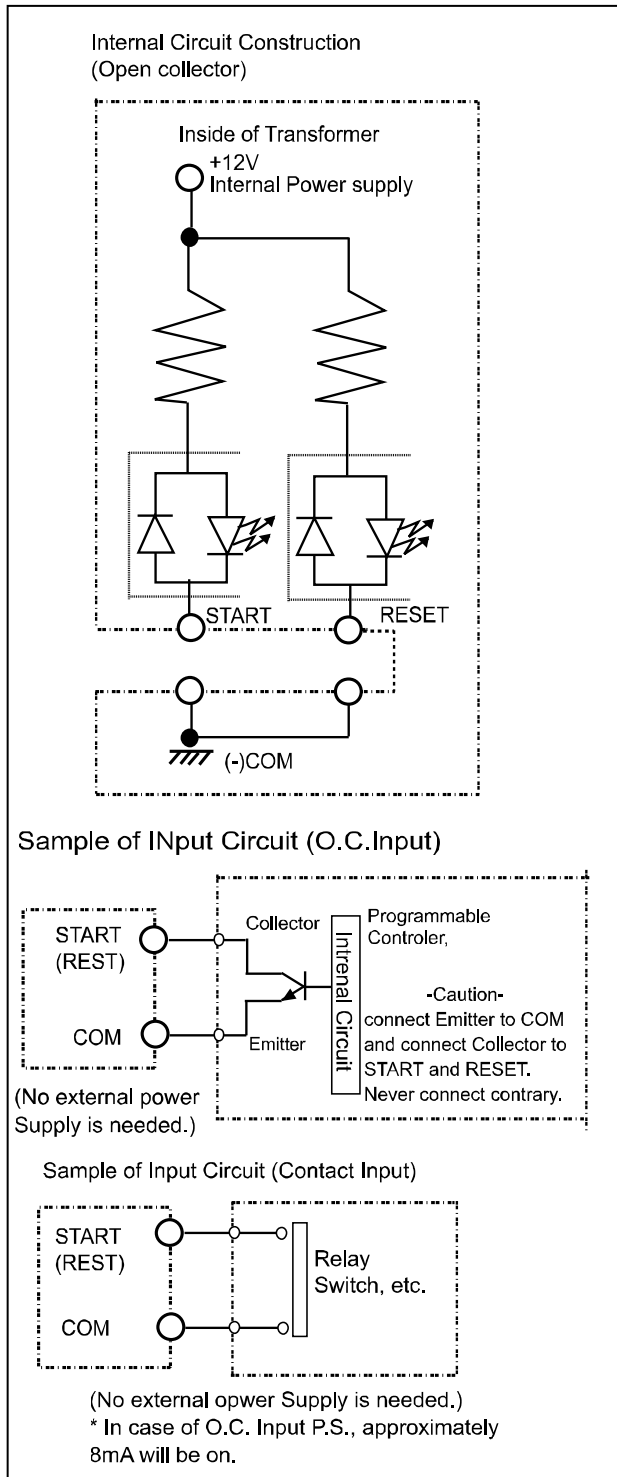
SW103 is placed toward Rear Panel side (VI)--Voltage Input.
toward Front Panel side (OC)--Open Collector Input.

Switch Location On the circuit Board

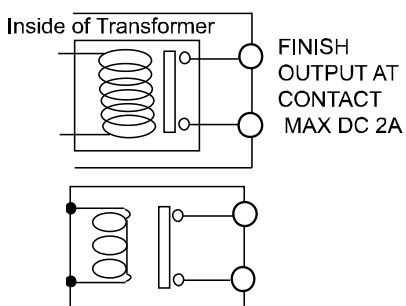


For more details, read following timing Chart for proper use

Input and Output circuit

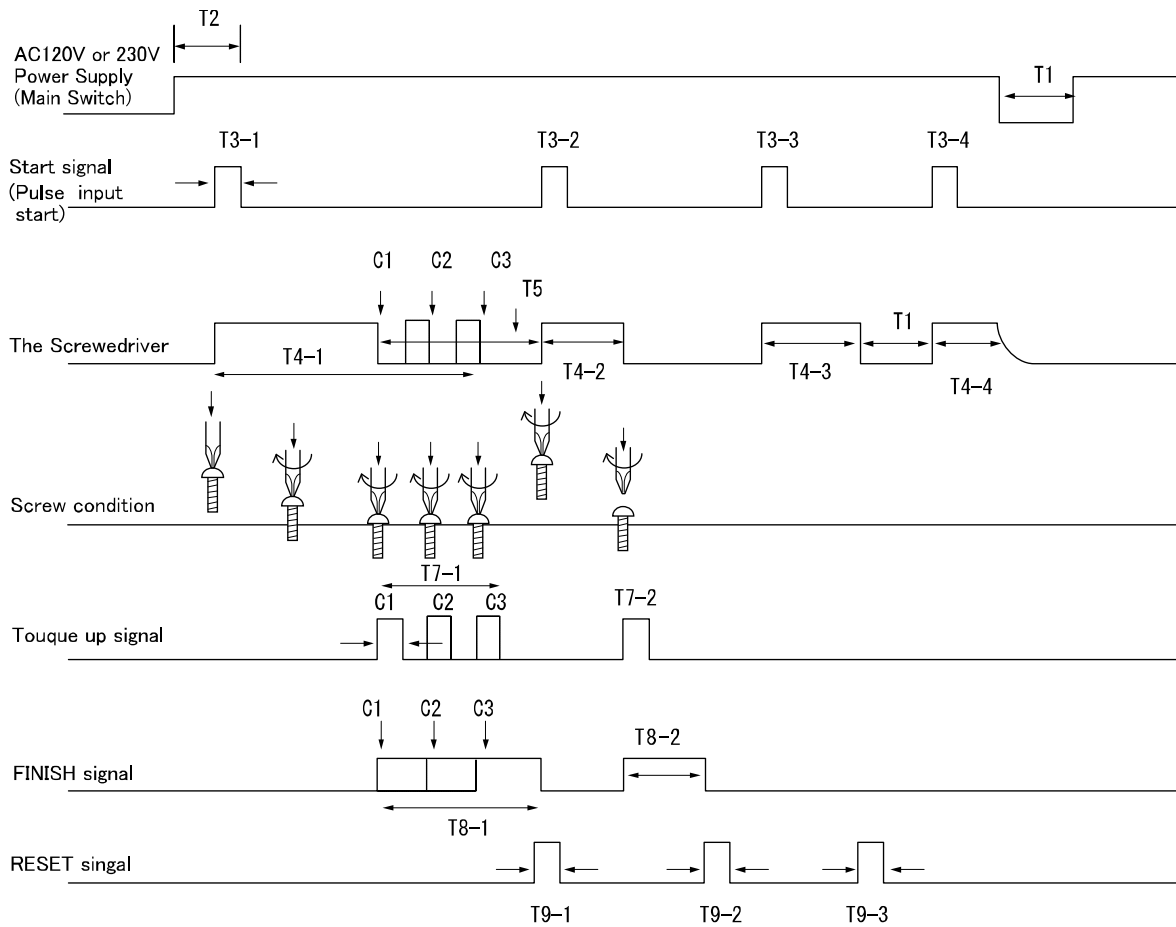


Finish Output circuit



Item	Resistance load:	Induction load: cosφ=0.4, L/R=7ms
Rated load	AC125V 0.5A DC30V 2A	AC125V 0.2A DC30V 1A
Rated current	2A	
The Max. Voltage at contact points	AC125V/DC60V	
The Min. applicable load	DC5V 1mA	

Timing Chart for Pulse input starting system



Description

T1: 2 seconds or more of interval between ON and OFF of Main Switch must be kept.

T2: The proper input time of STARTING signal should be 10 msec to 50 msec.

(You can monitor the input time with the FUNCTION LED.)

T3: The rotation of driver is indicated. (Also you can monitor the input signal with the FUNCTION LED.)

T4: This chart indicates that driver was stopped by torque up.

T5: This chart indicates that driver was stopped by RESET signal.

T6: This signal is output to the Transformer from driver when from driver when the torque of driver reaches the fixed value.

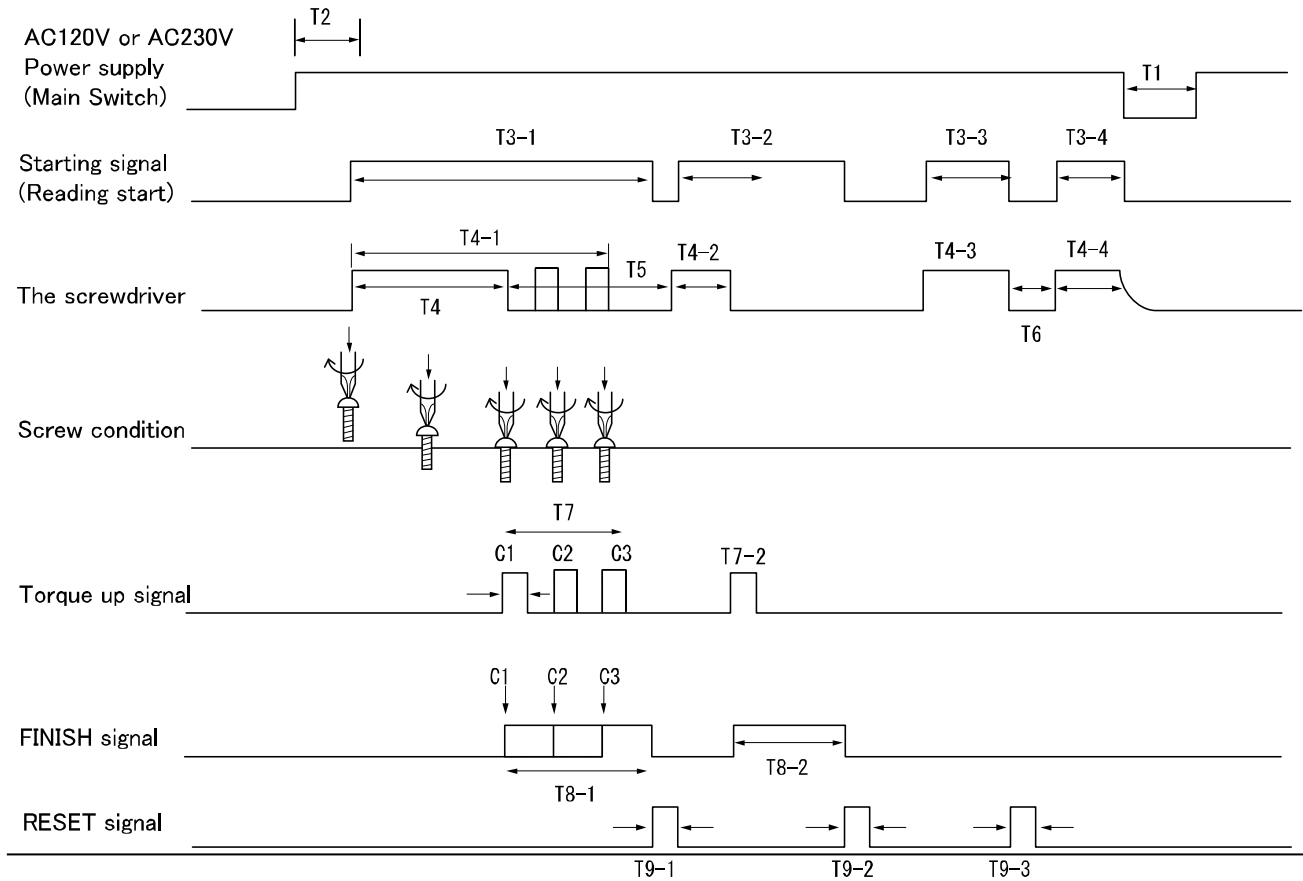
(Monitoring of input signal is possible with the FUNCTION LED.)

T7: The timing is changed as the dotted lines by the fixed value of torque up Counter.

T8: This signal is output when the torque of driver reaches the fixed value and screwing is completed. (Monitoring of input signal is possible with the FUNCTION LED.)

T9: Input of this RESET Signal is able to stop the rotation of driver at any time even external operation. (Monitoring is possible with the FUNCTION LED.)

Timing Chart for Reading starting system



Description

T1: 2 seconds or more of interval between ON and OFF of Main Switch must be kept.

T2: The power ON is reset when power is on. Even STARTING signal is on, the Transformer will start at the primal condition.

T3: This signal combines the starting and stopping signals of driver.

During the input of this signal, the driver rotates. However, in case that the torque is up, the rotation will stop and the FINISH Signal is output while this T3 signal is input (Monitoring of signal is possible with the FUNCTION LED.)

T4: The rotation of driver is indicated. (Monitoring of signal is possible with the FUNCTION LED.)

T5: This chart indicates that driver was stopped by RESET signal.

T6: This signal is output to the Transformer from driver when from driver when the torque of driver reaches the fixed value.

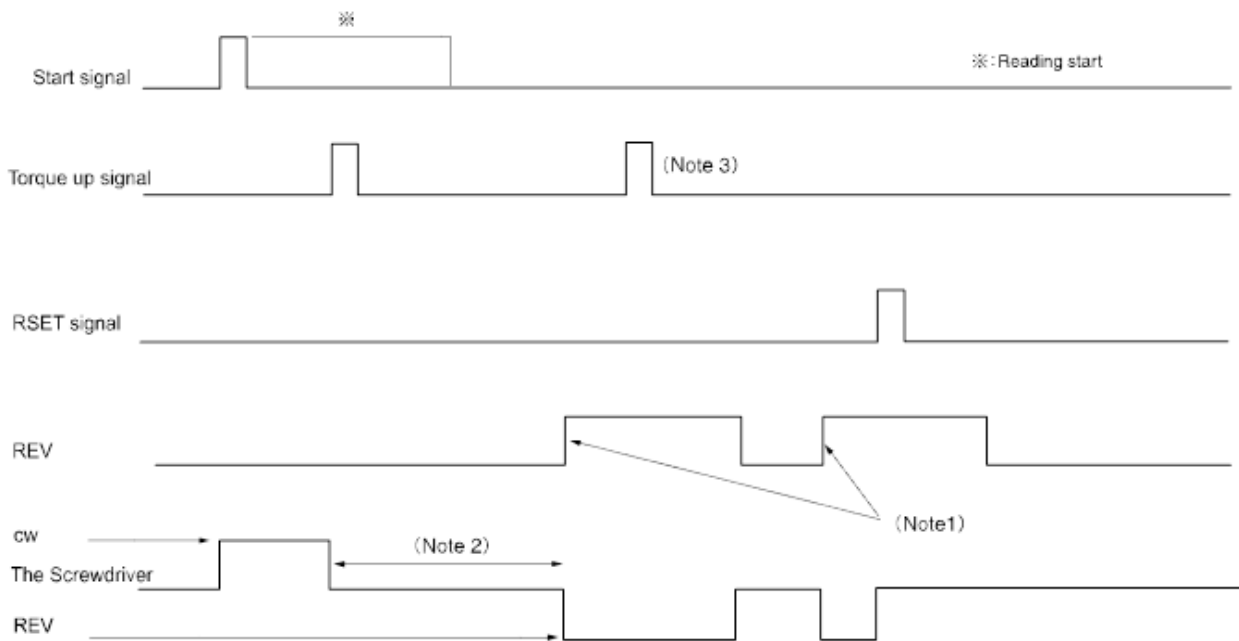
(Monitoring of input signal is possible with the FUNCTION LED.)

T7: The timing is changed as the dotted lines by the fixed value of torque up Counter.

T8: This signal is output when the torque of driver reaches the fixed value and screwing is completed. (Monitoring of input signal is possible with the FUNCTION LED.)

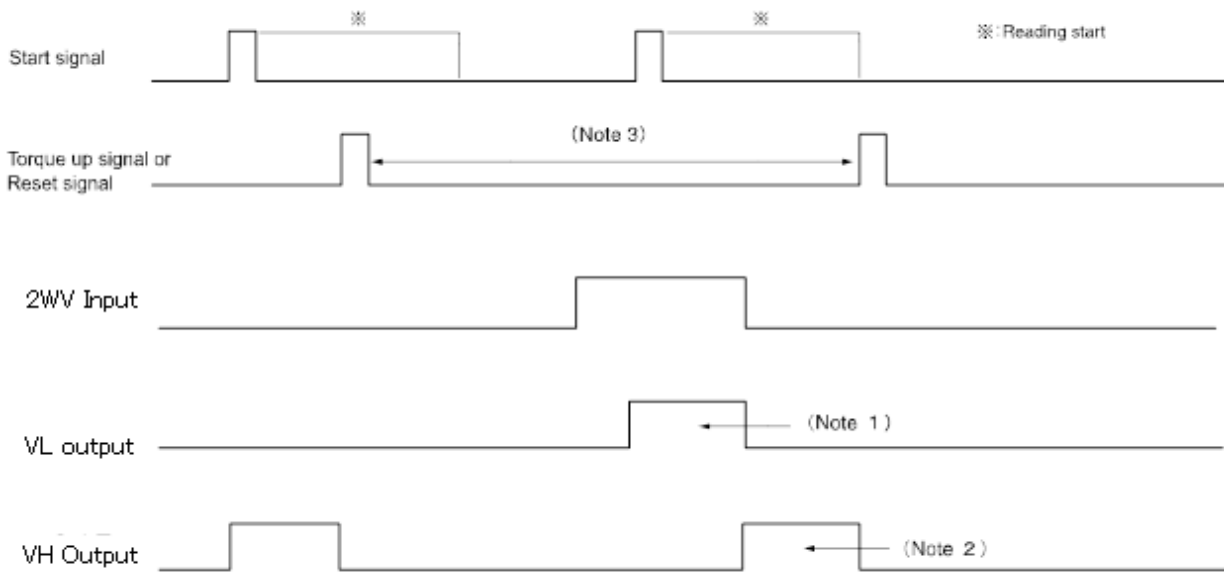
T9: Input of this RESET Signal is able to stop the rotation of driver at any time even external operation. (Monitoring is possible with the FUNCTION LED.)

●Timing Chart of Option **REV Starting System**



Note 1: Activate "RV" terminal when the screwdriver is not in motion.
 Note 2: To change from "FOR" to "REC" or vv, wait more than 0.3sec.
 Note 3: "Torque up" is ignored during "REV" rotation.

●Timing Chart of Option **2WV Starting System**



Note 1: When "2WV" input is active, output "VL" voltage: adjustable between 5V and 15V
 Note 2: When "2WV" input is inactive, output "VH" voltage: adjustable between 17V and 30V
 Note 3: Avoid "Torque up" during "VL" output.

Notice of using Transformer for Multiple Axes

1. Whenever the multiple axes driver is controlled, each of CLT-AY-61/81 Transformer should be used individually in each sequencer or system side. Simultaneous starting operation or AND execution of FINISH signal should be controller at each sequencer or system side.
2. In case of open corrector Input, never connect both STARTING input terminals and in the same way, never connect both RESET input terminals whenever the multiple axes are controlled.
3. In case of voltage Input, whenever both STARTING input terminal are connected, the capacity of current should not exceed the range of possibility of sequencer or controller.
4. In case of voltage Input, whenever both RESET input terminals are connected, the capacity of current should not exceed the range of possibility to be driver by sequencer or controller.

Procedure of Setting and Installation

When the installation or setting this Transformer, read this manual well be make sure the safety operation.

CAUSION: Whenever installing or setting, the Transformer must be unplugged.

1. Confirm the matching or driver
2. Select all built-in switches according to control system.
3. Connect the driver and the Transformer is OFF.
4. Wiring must be done properly referring the Construction of Input/Output Circuit or Timing Charts.
5. Confirm the Main SW of Transformer is OFF.
6. After confirmation the voltage of inlet same as the rating (=AC100, 120V or 220-240V), then connect the AC plug to the inlet.
7. Turn the Mains SW ON.
8. After confirmation of safety, operate the test run to observe the proper control.
9. The actual running should be operated after observation of function is completed.

■ Power supply for Automatic screwdriver

CLT-AY-61 **2WV** option: 2WV, REV or 2WV+REV
Option

CLT-AY-81



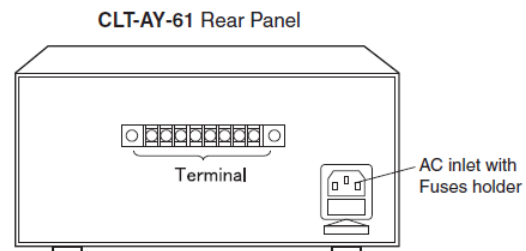
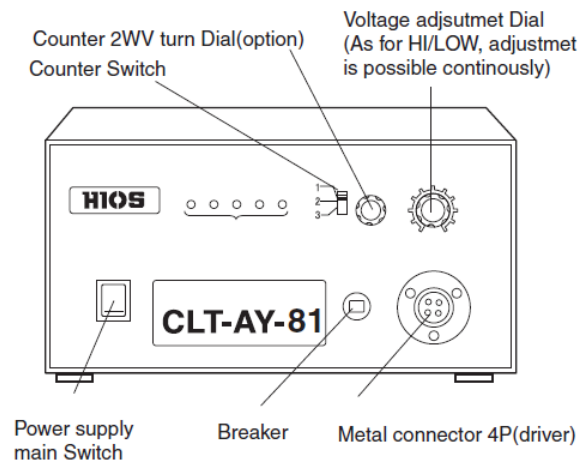
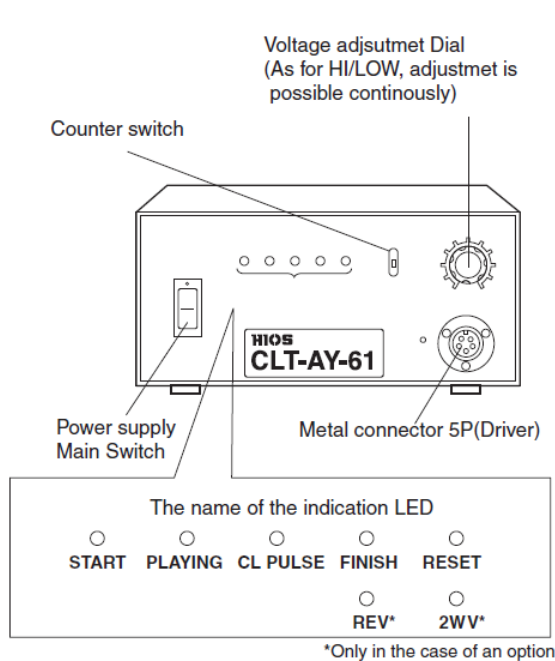
CLT-AY-61



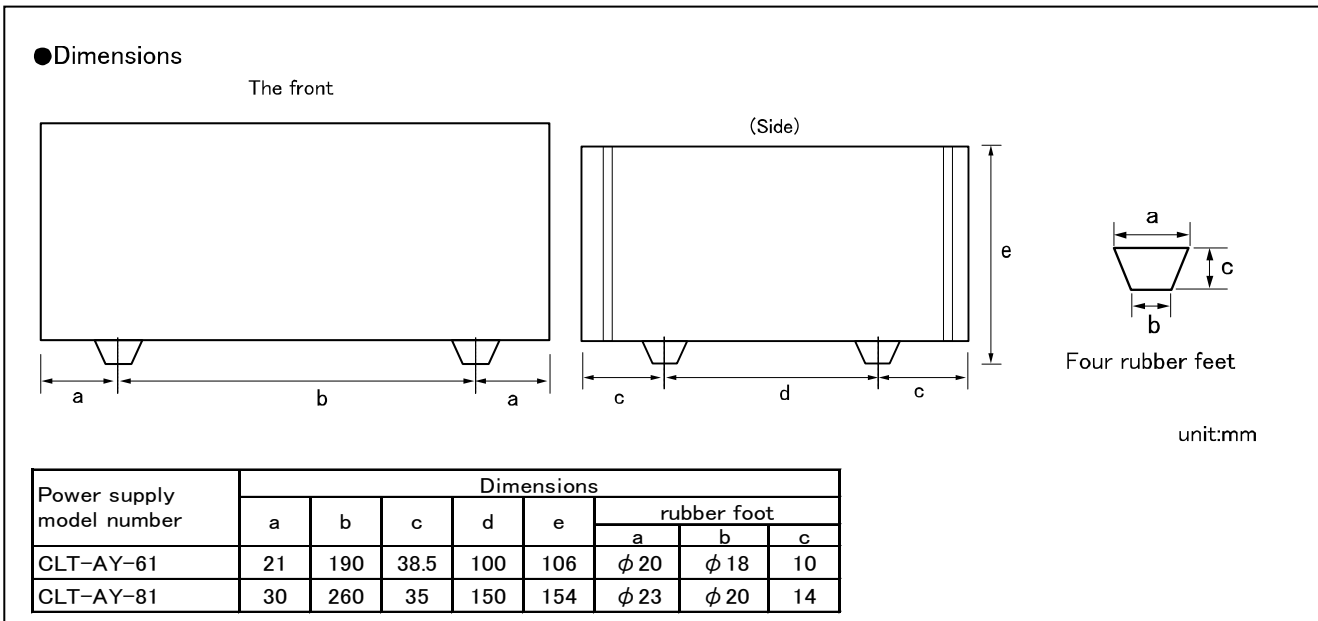
CLT-AY-81

● Specifications

Model Name	CLT-AY-61	CLT-AY-81
Input Voltage	AC120V or AC220-240V ± 5%(50/60Hz)	AC100V only ± 5%(50/60Hz)
Output Voltage	DC17-30V variable(PWM) Max.4A	DC17-30V variable(PWM) Max.10A
Power consumption	180W	350W
Size (mm)	232 × 177 × 106(H)	320 × 220 × 154(H)
Weight (kg)	4.2 kg	13.5 kg
AC cord length (mm)	1.8 m (Inlet type with ground wire)	1.8 m (Inlet type with ground wire)
Applicable drivers (1 driver only)	CLF-3000, CLF-4000, CLF-6000, CLF-6500, CLG-7000, α F-4500, α F-5000, α F-6500	CL-816A, CL-825A, CL-850A



● CLT-AY-81 is different form CLT-AY-61 in an installtion position of the terminal level.



●Standard specifications of the power supply.

1. The output voltage is adjustable from HI (approx.30V) to LOW (approx.17V) positions on the voltage adjusting Dial.
2. The circuit is designed to give priority for the reset function. So the screw driver will be stopped by the input of RESER at any time. Any condition.
3. The counter switch* which can give the maximum 3 times of impact tightening in accordance with the screw tightening conditions, is provided.
4. Input system is selectable.
 1. Starting system : Pulse input starting system or Reading starting system
 2. Input system: Open collector Input (Low active) or Voltage input (High active).
 3. Screw driver : Hios-product(HH/XH) or Nittoh Seikou-product(HH/XN) are applicable
Each selection or adjustment is changeable even after purchase. (See the instructions)
5. Monitoring Input/Output function is possible with the function LED on the front panel. (Provided LED are: STRAT, PLAYING, CL,PULSE FINGISH RESET and so on)
6. The inlet with fuse holder is adopted.

*: The counter switch is designed to select the number of impact time when the torque value of screw driver is increased. Select the time according to tightening conditions.

Options

The power unit have two kinds of options as follows.

2WV: The control of low rotation (5 to 15V) by an external operation is possible. 2WV LED lights on during the LOW rotation. (The function will support the screw tightening.)

REV: The control of REV rotation by an external operation is possible. REV LED lights on during the REV rotation.

Please order the options at the same time of purchase.

Installing Option after purchase is NOT available.

China RoHS2 Table

If you export to China by yourselves, below is the table of China RoHS2

有害物质名称及含量标识格式						
产品中有害物质的名称及含量						
部件名称	有害物质					
	铅 (pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电路板总成	×	○	○	○	○	○
外壳	○	○	○	○	○	○
螺丝刀线	×	○	○	○	○	○
-						
-						
-						
-						
-						

本表格依据SJ/T 11364 的规定编制。

○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572 规定的限量要求以下。

×：表示该有害物质至少在改部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。

In addition, if the following mark cannot be found at the rear side of the product and/or Product box, cut off a mark and stick a mark to the product and/or product box.

Note: minimum size of China RoHS mark is 5mm at outer diameter

