# VZ Series Instruction Manual

## HIOS MANUAL VERSION 1997

**TRANSFORMERLESS SCREWDRIVER**

**HIOS VZ SERIES 120VAC**

**LEVER START**

**VZ-1820**
**VZ-3012**
**VZ-4506**
**VZ-3012LT**

**PUSH TO START**

**VZ-1820PS**
**VZ-3012PS**
**VZ-4506PS**
**VZ-3012LT**

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**ISO 9001 : 2000**

## WARNING

When using electric tools, basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury, including the following:

## READ ALL INSTRUCTIONS

1. **Keep Work Area Clean.**
   Cluttered areas and benches invite injuries.

2. **Consider Work Area Environment.**
   Don't expose tool to rain. Don't use tool in damp or wet locations.
   Keep work area well lit.
   Never use the tool at an area with dangerous object. (gasoline, benzene, thinner, gas glue, etc.)

3. **Secure Work.**
   Use clamps or vise to hold work. It's safer than using your hand and it free both hands to operate tool.

4. **Guard Against Electric Shock.**
   Prevent body contact with grounded surfaces, for example: pipes, radiators, ranges, refrigerator enclosures.

5. **Keep Children Away.**
   Do not let visitors contact tool. All visitors should be kept away from work area.

6. **Store Idle Tools.**
   When not in use, tools should be stored in dry, and high or locked-up place out of reach of children.

7. **Don't Force Tool.**
   It will do the job better and safer at the rate for which it was intended.

8. **"Remove Adjusting Keys And Wrenches.**
   From habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on."

9. **Use Right Tool.**
   Use the tool for the proper work against its power and intended purpose.

10. **Dress Properly.**
    Do not wear loose clothing or jewelry. They can be caught moving parts.
    Wear protective hair covering to contain long hair.



11. **Use Safety Glasses.**
    Also use face or dust mask if operation is dusty.

12. **Don't Abuse Cord.**
    Never carry tool by cord or yank it to disconnect from receptacle.
    Keep cord from heat, oil and sharp edges.

13. **Don't Overreach.**
    Keep proper footing and balance at all times.

14. **Maintain Tools With Care.**
    Keep tools sharp and clean for better and safer performance.
    Follow instructions for lubricating and changing accessories.
    To use the tool for long time safely, perform the periodical inspection for the tool and if damaged, it must be repaired by authorized service facility.
    Keep hand dry, clean and free from oil and grease.
    Inspect extension cords periodically and replace if damaged.

15. **Disconnect Tools.**
    When not in use such as attaching and detaching the bit, changing the Carbon Brush, inspection or cleaning, etc., disconnect tool.

16. **Avoid Unintentional Starting.**
    Be sure switch is off when plugging in.
    Don't carry tool with finger on switch.

16A. **Extension Cords.**
    Make sure your extension cords is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and over heating. Table 1 (See Table 1) shows the correct size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord.

TABLE 1
MINIMUM GAGE FOR CORD SETS[a]

| Volts | Total Length of Cord in Feet | | | |
|---|---|---|---|---|
| 120V | 0 - 25 | 26 - 50 | 51 - 100 | 101 - 150 |
| 240 | 0 - 50 | 51 - 100 | 101 - 200 | 201 - 300 |

| Ampere Rating More Than | Not More Than | AWG | | | |
|---|---|---|---|---|---|
| 0 | 6 | 18 | 16 | 16 | 14 |
| 6 | 10 | 18 | 16 | 14 | 12 |
| 10 | 12 | 16 | 16 | 14 | 12 |
| 12 | 16 | 14 | 12 | Not Recommended | |

[a]Only the applicable parts of the Table needs to be included. For instance, a 120-volt product need not include the 240-volt heading.

17. **Stay Alert.**
Watch what you are doing. Use common sense. Do not operate tool when you are tired.

18. **Check Damaged Parts.**
Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving part, binding of moving parts, breakage of parts, mounting and any other conditions that may affect its operation.
A guard or other part that is damaged should be properly repaired or replaced by an authorized service man or authorized service facility unless otherwise indicated elsewhere in this instruction manual.

19. **"Outdoor Use Extension Cords.**
When tool is used outdoors, use only extension cords intended for use outdoors and so marked."



# GROUNDING INSTRUCTIONS

The tool should be grounded while in use to protect the operator from electric shock.

The tool is equipped with a three-conductor cord and three-prong grounding-type plug to fit the proper grounding-type receptacle.

The green (or green and yellow) conductor in the cord is the grounding wire.

Never connect the green (or green and yellow) wire to a live terminal.

If your unit is for use on less than 150V, it has a plug that looks like that shown in Figure 1.

An adapter (see Figure 3) is available for connecting Figure 1-Type Plug to 2-prong receptacles.

The green colored rigid grounding strap must be connected to permanent ground such as to a properly grounded outlet box.

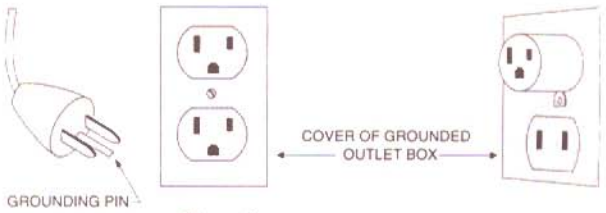



Figure 1 Figure 2


Figure 3

For safe use of adapters, the outlet box must be grounded. If there is any doubt, have a qualified electrician check connections.

Use only 3-wire extension cords that have 3-prong grounding type plugs and 3 pole receptacles that accept the controllers plug. Replace or repair damaged cords.

## CAUTIONS IN OPERATION

1. This Screw Driver is integral unit consisting of Screw Driver parts and cord parts.
   If any trouble occur, don't take a part off the tool. Stop the operation and have the repair it immediately.
2. Never lubricate aerosol oil and the like. Otherwise it may cause the expensive repair.
3. Do not drop, hit or abuse the tool. Otherwise it may cause some trouble such as crack or damage.
4. Never use the chemicals to wipe the body cover.
5. Use under the proper voltage (120V) . Never use under the higher voltage.
6. Do not pull the AC cord when unplug the AC plug. Otherwise it may cause the breaking of wire.
7. To avoid trailing the AC cord on floor, use the Spring Balancer to hang the AC cord.
8. For the safety use, do not set the torque adjusting nut at higher than 10 on the torque adjusting scale. (Ref.to P.8 )
9. Use the tool intermittently: (ex: 0.5sec. on / 3.5sec. off)
10. Do not tighten more than 900 pcs of tapping screws per 60 minutes.
11. This tool is not for tightening up wood screw.
12. During the motor is running, never change the forward ↔ reverse direction immediately.
13. Whenever the tool is not in use, set the start switch and Forward/off/Reverse switch to "OFF" position and unplug the AC cord plug.
14. Use of model VZ-4506PS at high torque settings brings a very high impact to the operator's hand. Please use this tool with caution, as Carpal Tunnel Syndrome (CTS) or other trauma disorders may result.
    This shock-Resistant Stand absorbs torque to the operator's hand during operation. (Ref.to P.12)



## SAVE THESE INSTRUCTIONS

We thank you for your purchase of Hios Electric Screw Driver.

## SUMMARY

This VZ Series Screw Driver is a Control Function Built-in Type.

The body is light and designed to decrease the vibration and noise.

And "non-round" shape is adopted for the grip part to avoid the user's fatigue and for the easy gripping.

It is possible to use hexagonal bit with opposite side of 6.35mm (1/4 inch. HEX.)

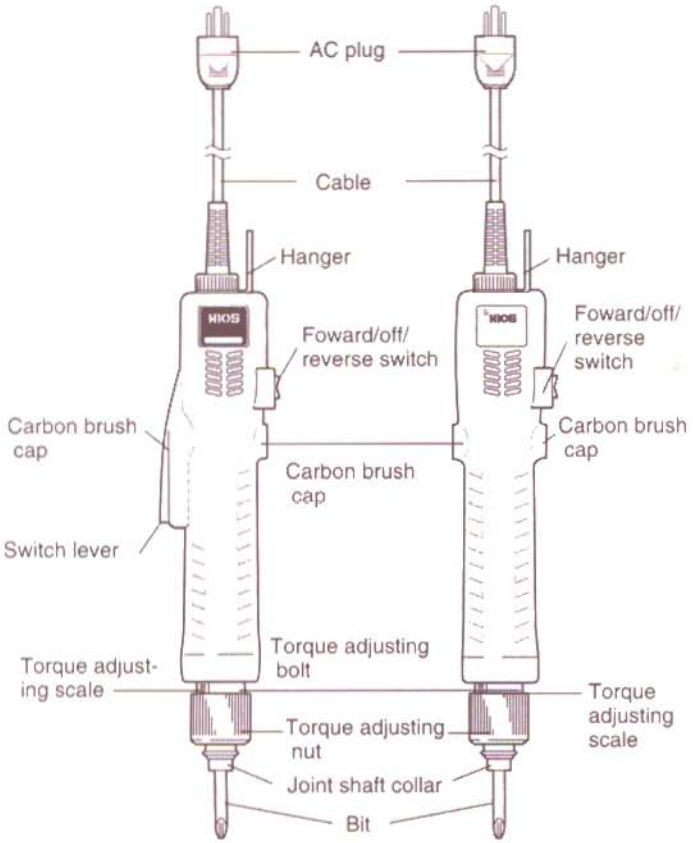
Also, you can select the starting system (Lever Start and Push to Start) in accordance with the work.

## SPECIFICATIONS

| Model No. | | VZ-1820<br>VZ-1820PS | VZ-3012<br>VZ-3012PS | VZ-4506<br>VZ-4506PS |
|---|---|---|---|---|
| Output Torque Range | Lbf.in | 3.5 - 16 | 7.8 - 26 | 8.8 - 39 |
| | kgf.cm | 4 - 18 | 9 - 30 | 10 - 45 |
| | N.m | 0.39 - 1.76 | 0.88 - 2.94 | 0.98 - 4.4 |
| Power Consumption | | Approx.40W | | |
| Input | | AC 120 V | | |
| Unloaden Rotation Speed (r.p.m) | | 2000 | 1200 | 600 |
| Screw Size (mm) | Small Size Screw | 2.6 - 4.0 | 3.0 - 5.0 | 3.0 - 5.0 |
| | Tapping Screw | 2.6 - 3.0 | 3.0 - 4.0 | 2.6 - 4.0 |
| Dimension (mm) | Grip dia. | Ø37.8 | | |
| | *Length | 276 (280) | | |
| Bit Type | | 1/4 Hexagonal | | |
| * Weight (g) | | 660 (660) | | |
| Cable (m) | | 3 | | |

*: Numeric data in ( ) is weight of push-to-start driver.

# PARTS NAME




Lever start type Push to start type

# ACCESSORIES

- BITS (6.35mm,1/4 inch. HEX.SHANK)



# HOW TO USE

## ■ OPERATION

1. Insert the Bit into the Joint Shaft Collar of the ScrewDriver.

Refer to P.10, How to attach the Bit

2. Turn the Torque Adjusting Nut and adjust the tightening torque.

Refer to P.10, How to adjust the torque

3. Make sure the Forward/Off/Reverse Switch is in the "OFF" position.
4. Insert the AC Plug into the AC 120V socket.
5. Set the Forward/Off/Reverse Switch at the "FORWARD" position.

   **(CAUTION)**
   Whenever the direction of rotation is changed, make sure the Forward/Off/Reverse Switch is in the "OFF" position.

6. Fit the Bit to the recession of a screw head, then push the Switch Lever to start the motor.

   - Push to Start System ··· Motor automatically starts by pressing the tip of Bit against the recession of a screw head.

7. The clutch will automatically stop the rotation of motor when the torque reaches to the fixed value. Release the Switch Lever to put the Bit off the screw. By the repeat of these operation, screw is tightened continuously.

   - Push to Start System is automatically released by moving the Bit away from screw head.

8. To loosen the tightened screw, turn the Forward/Off/Reverse Switch to "REVERSE" position.

   - When the screw can not be loosened, tighten up the Torque Adjusting Nut.

# HOW TO HANDLE EACH PART

## ■ How to attach the Bit

**(CAUTION)**
Whenever changing the Bit, make sure that Forward/Off/Reverse Switch is in the "OFF" position, or AC cord plug is unplugged.

- It is possible to use general Hexagonal Bit with opposite side of 6.35mm. (1/4 inch. HEX.)
- Push down the joint shaft collar at the top of the Screw Driver and insert the Bit.

## ■ How to adjust the torque

The Torque Adjusting Scale does not indicate the torque value directly. The torque value of each scale is indicated by the Approximate Guidance of Output Torque on P.12.
Sometimes, there may be difference between fixed value and actual tightening torque by the condition of screw and materials. Please use this Approximate Guidance to get the approximate torque value.

(1) Referring the Approximate Guidance of Output Torque, decide the position of Torque Adjusting Nut in the Torque Adjusting Scale.

(2) Rotate the Torque Adjusting Nut and set the right upper of decided graduation.

(3) Start the motor and tighten the screw. Check the condition of tightening screw.

(4) If the tightening is not enough, tighten up the Torque Adjusting Nut.
In case of opposite, loosen it. Repeating the adjustment, find the most suitable point.

## ■ We recommend to use the HIOS Measurement Tools to set the torque of Screw Driver or to check the torque of screw.

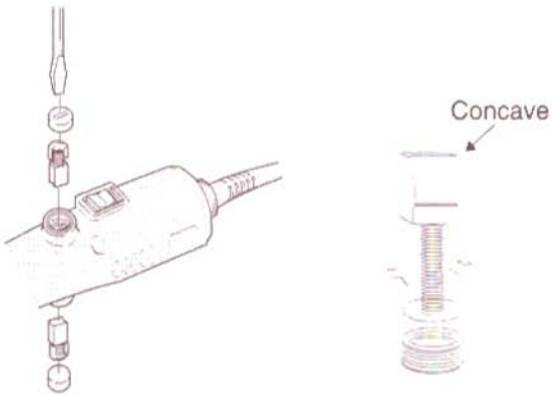
- With function of 450 memory data items. To measure the loosening torque or tightening torque ··· HDM Type
- To set the torque of Electric Screw Driver or to check the measurement tools (Torque Driver, etc) ··· HP Type



## ■ How to change the Carbon Brush

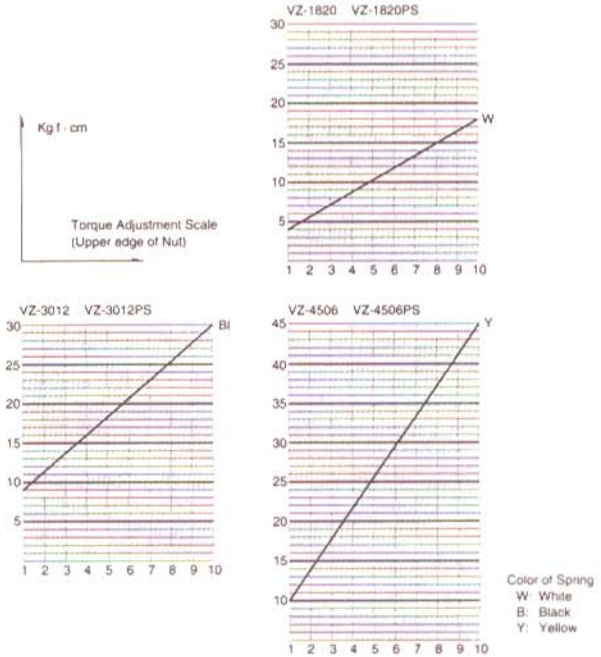
**(CAUTION)**
Whenever changing the Carbon Brush, AC plug should be unplugged.

- Unscrew the slotted Carbon Brush Cap by Minus ( - ) Driver and remove it.
- When the Carbon Brush Cap is changed, pay attention to the direction of brush surface (concavity). Insert the Brush to fit its surface to the Commutator's.
- Slot on the side of Carbon Brush indicates Limit for Use. Change the Brush when it is abraded over the Slot. To keep the good conditon, we recommend to change it earlier.
- Be careful so as not to tighten the Carbon Brush Cap too strongly.




| Trouble | Possible Causes & Treatment |
|---|---|
| ①The motor does not rotate sometimes. | •Is the Carbon Brush abraded ?<br>If so, replace it with new one.<br>•Is the cord broken out ?<br>If so, stop the operation and have repair. |
| ②The Screw Driver outputs low torque. | •Is the torque fixed at a proper position ?<br>Please refer the Approximate Guidance of Output Torque carefully.<br>•Is the Carbon Brush abraded ?<br>If so, replace it with new one. |

## ■ Approximate Guidance of output Torque




# ACCESSORY UNITS (Sold separately)

### ■ Shockless Stand

VZ18PS-SAS
(Push-to-start type)

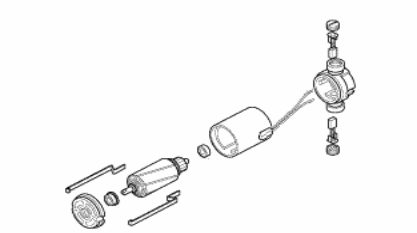
Stand arm absorbs torque reaction force to lighten operator fatigue.

### ■ Pistol Grip Attachment

PG-18
(Lever-start adaptor kit)
PG-18PS
(Push-to-start adaptor kit)

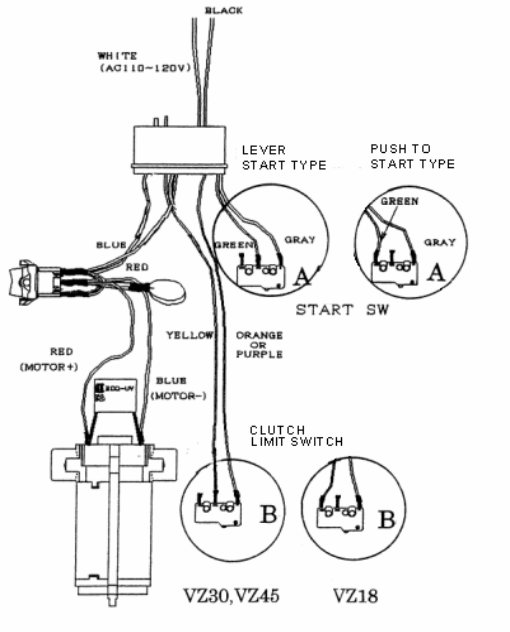
**The VZ series tools have a recommended duty cycle. This means that the tool must rest for a period of time after each screw which is driven. The duty cycle for the VZ series tools requires that the tool rest for 3.5 seconds for each .5 second of operation. The duty cycle is therefore 4 seconds. This equals 15 screws per minute.**

**This is a common trait of almost every brush type direct plug in tool. This is due to the higher voltages and heat build up during operation. Running the tool in excess of the duty cycle will lead to motor failure and the failure of the internal circuit. To prevent this HIOS has added a thermistor to the motor magnet Of the VZ series tools. When the motor heats up to a specific temperature the thermistor will open and the tool will not operate until the motor cools down and the thermistor resets itself. Below is a drawing of the VZ motor showing the location of the thermistor at the rear end of the magnet housing.**



**If you have a tool which operates normally for a period of time then shuts down, let it cool down and see If the tool will restart. If the tool will run again it is operating normally and there is no fault in the tool.**

**The same circuit assembly is used in all VZ series tools. It is wired differently depending on whether the tool is a lever start tool or a push to start tool. Also the VZ-18 tools are wired differently from the VZ-30 and VZ-45. Refer to the drawing below to wire a replacement circuit assembly properly.**

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