

OPERATION MANUAL

Please read these instructions before use and keep them where the operator may refer to them whenever necessary.

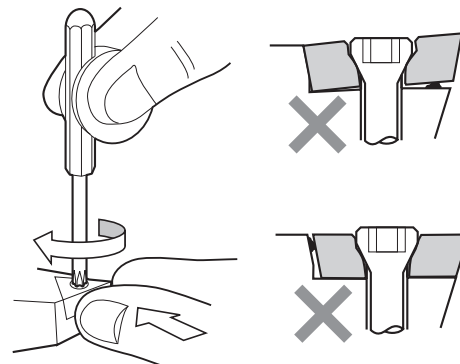
This product is designed for internal boring. For pin turning, **BIG** Pin Turning Series is available.

ATTACHMENT OF INSERT

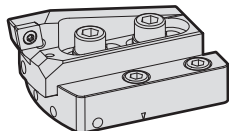
- Before the insert is attached, blow compressed air on the surface of the insert seating to remove chips, dust, oil and etc.
- Wipe the back and side surfaces of the insert thoroughly with a waste.
- Attach the insert on the insert seating surface while pushing lightly, and tighten it with the insert clamping screw.
- Ensure that there is no gap on the seating surface before use.

CAUTION

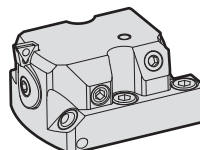
- Do not use a clamping screw other than genuine or attached one.
- Be aware of cutting your hand with a cutting edge when exchanging the insert.
- Since the insert clamping screw is expendable, exchange them periodically.



FOR TW/EWN200 BORING TOOLS



In case of TW200 boring tools,
see the PG.2.



In case of EWN200 boring tools,
see the PG.3.

MAXIMUM ALLOWABLE SPINDLE SPEED

Slide Model	Max. speed	Slide Model	Max. speed
SLN200-270	1,600 RPM	SLN200-270AL	3,200 RPM
SLN270-340	1,200 RPM	SLN270-340AL	2,400 RPM
SLN340-410	900 RPM	SLN340-410AL	1,900 RPM
SLN410-480	750 RPM	SLN410-480AL	1,600 RPM
SLN480-550	650 RPM	SLN480-550AL	1,300 RPM
SLN550-620	600 RPM	SLN550-620AL	1,100 RPM
SLN620-690	500 RPM	SLN620-690AL	1,000 RPM
SLN690-760	450 RPM	SLN690-760AL	900 RPM
SLN760-830	400 RPM	SLN760-830AL	800 RPM

CAUTION

- NEVER exceed the maximum allowable spindle speed.
- Ensure that all of the clamping screws must be fastened securely before actually starting to rotate.
- This maximum allowable spindle speed is the limit value determined from the structure of the tool. It is not guaranteed to be applicable for actual boring.
- The rigidity of machine spindle and workpiece, and the length of boring tool influence the condition such as vibration, etc. In order to actually determine the cutting condition, increase the speed gradually starting from the lower cutting condition, while confirming safety.

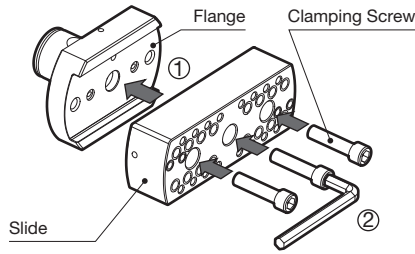
COMMON CAUTION FOR TW AND EWN HEAD

CAUTION

- Boring range of the boring head must not be exceeded.
- It is recommended to conduct trial boring, because the actual diameter after boring operation may vary depending on cutting conditions, etc.
- NEVER conduct boring under unsuitable cutting conditions. Refer to the General Catalog for recommended cutting conditions.
- Remove any particles, flaws or rust from the CK or other connections.
- When assembling, wipe each contact face carefully with a clean cloth or similar before clamping each screw securely.
- Do not connect **KAISER BORING SYSTEM** with any other boring system.
- NEVER continue using the boring head if it has suffered strong impact by bumping.
- Wear safety glasses during boring operation.

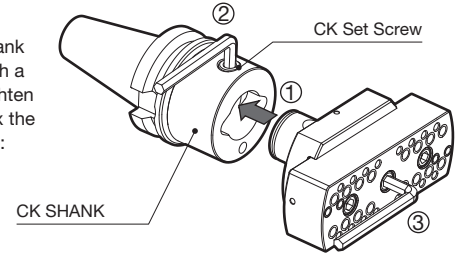
ASSEMBLY OF SLIDE

Mount the Slide to the Flange and slightly tighten (3) clamping screws.



ASSEMBLY OF FLANGE

Mount the Slide/Flange assembly into the CK shank and fix them securely with a CK set screw. Finally tighten (3) clamping screws to fix the Slide. (Tightening torque: 45N·m (33 lbf·ft))



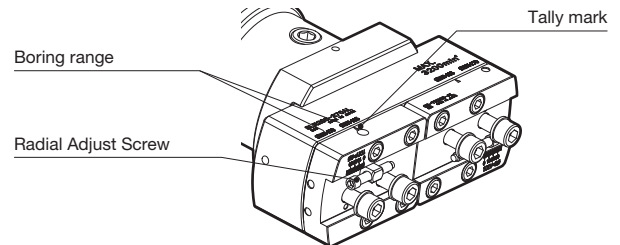
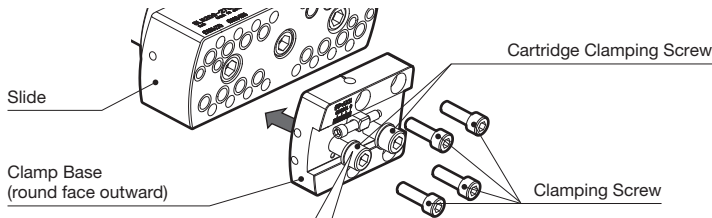
TW200 BORING TOOLS (FOR ROUGHING)

ASSEMBLY OF CLAMP BASE

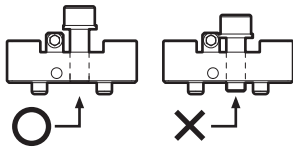
- Ensure the round face of the Clamp Base should be outward. Select the right boring range marked on the Slide according to the table below, align it with the tally mark on the Clamp Base, tighten (4) clamping screws and fix the Clamp Base to the Slide. (Tightening torque: 17N·m (12.5 lbf·ft))

⚠ Ensure the Cartridge Clamping Screws are securely tightened. If the screw is sticking out of the face of the Clamp Base, the Clamp Base is not fixed completely and it may cause an accident in operation or damage to the tool components.

- Assemble the other Clamp Base with (4) clamping screws in the opposite side by choosing the identical diameter range chosen for the previously mounted Clamp Base.



CAUTION

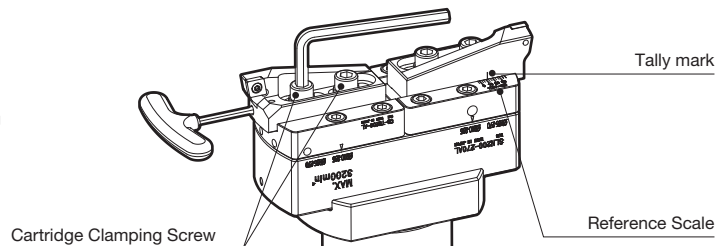
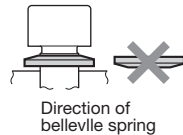
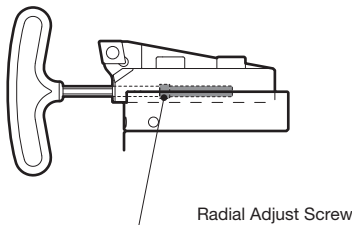


Boring Range	eg. SLN200-270AL
$\phi D_{min.} - \phi D_{min.} + 35mm (1.378)$	$\phi 200 - \phi 235mm (\phi 7.874 - \phi 9.252)$
$\phi D_{min.} + 35mm (1.378) - \phi D_{min.} + 70mm (2.756)$	$\phi 235 - \phi 270mm (\phi 9.525 - \phi 10.630)$

$\phi D_{min.}$ = Min. boring diameter of the Slide

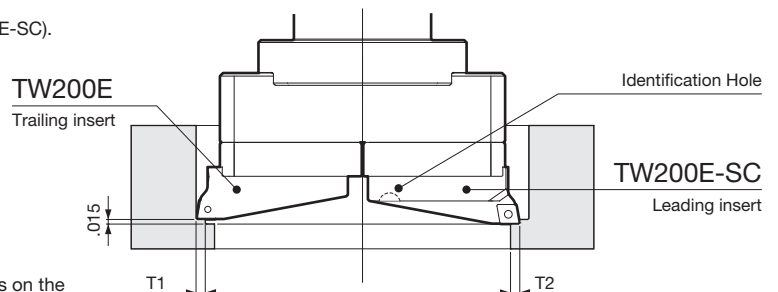
ASSEMBLY OF TW CARTRIDGE

- Mount the Cartridge on the Clamp Base. Rotate the Radial Adjusting Screw with a T-shape wrench and adjust the position of the Cartridge to the target diameter roughly by reading the reference scale with the tally mark.
- Slightly tighten the Cartridge Clamping Screws with fingers until the belleville spring is rightly depressed.
- Rotate the Radial Adjusting Screw and adjust the position of the Cartridge to the exact target position.
- Tighten the Cartridge Clamping Screws alternately while increasing the tightening torque gradually until the Cartridges are fixed securely. (Tightening torque: 22N·m (16.2 lbf·ft))
- Assemble the other Cartridge in the same procedure.



STEP CUTTING

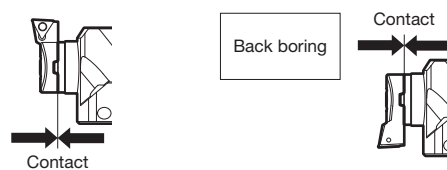
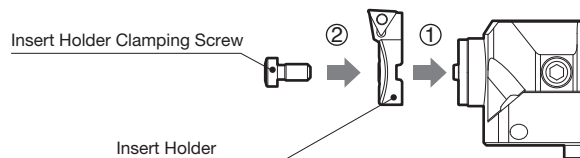
- Step Cut is available by utilizing the optional Cartridge for Step Cut (model TW200E-SC).
- TW200E-SC carries an identification hole as shown right for easier distinction from the TW200E.
- Set the TW200E-SC as a leading cartridge and the TW200E as a trailing cartridge.
- Cartridges should be adjusted so that the depth of cut of both the leading (T2) and trailing (T1) inserts should be equal.
- Store the spare TW200E Cartridge separately in order to maintain the original pair. Mixing the pairs may cause discrepancy in the height of Cartridges.
- Avoid cross-border setup of Clamp Bases between different boring range positions on the Slide. If not avoided, minimize the cutting speed considering the huge imbalance amount.



● EWN200 BORING TOOLS (FOR FINISHING)

ASSEMBLY OF INSERT HOLDER

- Clean the assembly surface of the insert holder and the head body.
- Mount the Insert Holder according to the convex shape of the seat. (For back boring, Insert Holder should be mounted upside down.)
- Tighten the Insert Holder Clamping Screw securely.

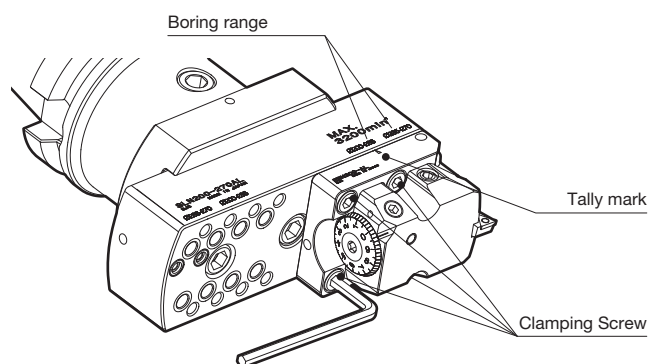


ASSEMBLY OF EWN HEAD

Mount the EWN head on the Slide in the position the Insert Holder becomes outward. Select the right boring range according to the table below and align the tally mark on the EWN head with the selected boring range marked on the Slide. Tighten (4) clamping screws and fix the Slide. (Tightening torque: 17N·m (12.5 lbf·ft))

Boring Range	eg. SLN200-270AL
$\phi D_{min.} - \phi D_{min.} + 35mm (1.378)$	$\phi 200 - \phi 235mm (\phi 7.874 - \phi 9.252)$
$\phi D_{min.} + 35mm (1.378) - \phi D_{min.} + 70mm (2.756)$	$\phi 235 - \phi 270mm (\phi 9.525 - \phi 10.630)$

$\phi D_{min.}$ = Min. boring diameter of the Slide

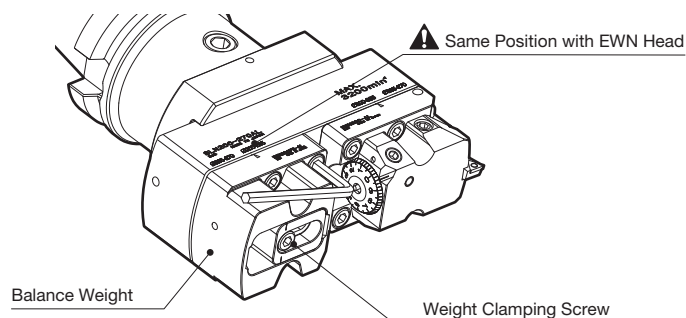


ASSEMBLY OF BALANCE WEIGHT

- Two models of the Balance Weights are available, balanceable BWN200FB-AL and pre-balanced BWN200PB-AL.
- Mount the Balance Weight on the Slide in the position the round surface of the Balance Weight becomes outward and fix it with (4) clamping screws. (Tightening torque: 17N·m (12.5 lbf·ft))

! CAUTION

Ensure to align the tally mark on the Balance Weight with the same diameter range selected for the previously mounted EWN head. Failure to do so may cause interference with workpiece, manufacturing defect or damage to the tool unit.

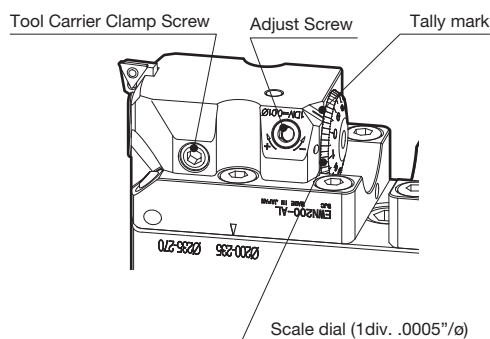


ADJUSTMENT OF BORING DIAMETER

- Loosen the Tool Carrier Clamp Screw in a counterclockwise direction.
- Rotate either the Adjust Screw or Scale Dial in a clockwise direction with a key, starting from the smaller to the target diameters.
- If diameter exceeds the target, return the Adjust Screw or Scale Dial in a counterclockwise direction till achieving the diameter approx. (5) divisions smaller than the target before attempting another adjustment.
- Tighten the Tool Carrier Clamp Screw in a clockwise direction.

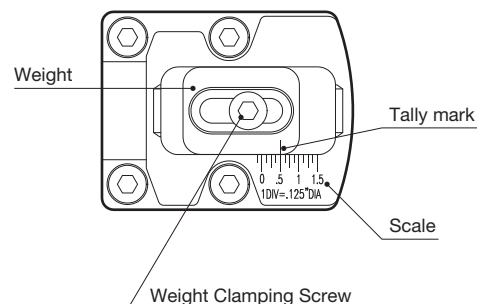
! CAUTION

- NEVER adjust the diameter before loosening the Tool Carrier Clamp Screw or exceed the adjustable boring range. Precision components in the head are damaged.
- Never use the key with an extension.



ADJUSTMENT OF BALANCE

- Balance is adjustable by referring to the tally mark and the scale.
- ϕD_1 : Target diameter
 ϕD_0 : Min. diameter at the selected diameter range
 (eg. SLN200-270AL Diameter range $\phi 200$ -235: $\phi D_0=7.874$ / Diameter range $\phi 235$ -270: $\phi D_0=9.525$)
Weight Positioning Value $X = \phi D_1 - \phi D_0$
- Align the tally mark of the Weight with the calculated Weight Positioning Value X of the scale. Chart shown right indicates the X = .500.
- Tighten the Weight Clamping Screw and fix the Weight. (Tightening torque: $17N \cdot m$ (12.5 lbf·Ft))



EXPANDED BORING DIAMETER WITH INSERT HOLDER

- Optional Insert Holders ENH7-2 and ENH7-3 can expand the boring range.

- Expanded diameter

ENH7-2 → +.984"/dia ENH7-3 → +1.969"/dia



ENH7-1

Base Insert Holder



ENH7-2 (+.984"/dia)



ENH7-3 (+ 1.969"/dia)

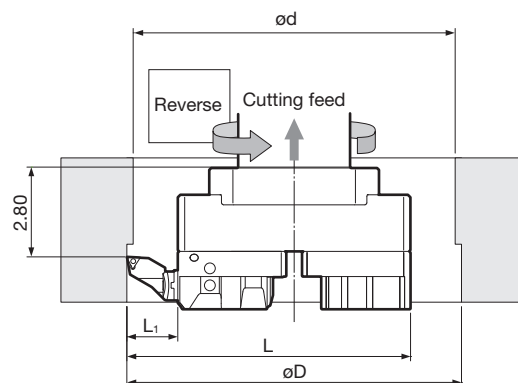
BACK BORING

- Back boring becomes possible by mounting the Insert Holder upside down.
- Check the formula shown below before cutting to ensure interference with the workpiece does not occur.
- While spindle rotation stopped, decenter the boring tool 180° opposite direction to the cutting edge and feed it into the bore. Return the boring tool to the center, start reverse rotation and reverse feed for cutting. Maintain clearance between the boring tool and workpiece when the tool is inserted into the bore.

eg. SLN200-270AL back boring diameter

ENH7-1: $\phi 8.346 - \phi 10.630$ ENH7-2: $\phi 8.858 - \phi 11.614$ ENH7-3: $\phi 9.843 - \phi 12.598$

$\phi d > L + \text{Clearance}$ $L_1 > (\phi D - \phi d) / 2$

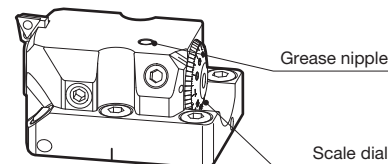


MAINTENANCE

- Although grease is injected as factory default, regularly inject grease into the grease nipple. (The grease is effective in removing coolant and dusts infiltrated.)
Grease Model : HSG50 (50g/net)
- Set the diameter of the EWN Head at minimum when greased.
- Continue to inject grease until it appears to ooze out from behind the Scale Dial or Grease Nipple.
- Occasionally adjust the boring head throughout its entire range when stored for an extended period.



Grease Gun
(Model: GRG-02)



Grease nipple

Scale dial

CAUTION

- Never overhaul boring heads.
- Failure to set the diameter of the boring head at minimum may damage the internal components in the following diameter adjustments.

BIG DAISHOWA SEIKI CO., LTD.