



TTi-120H
TTi-150H



CNC Gear Measuring System

Product catalog

Tokyo Technical Instruments Inc.



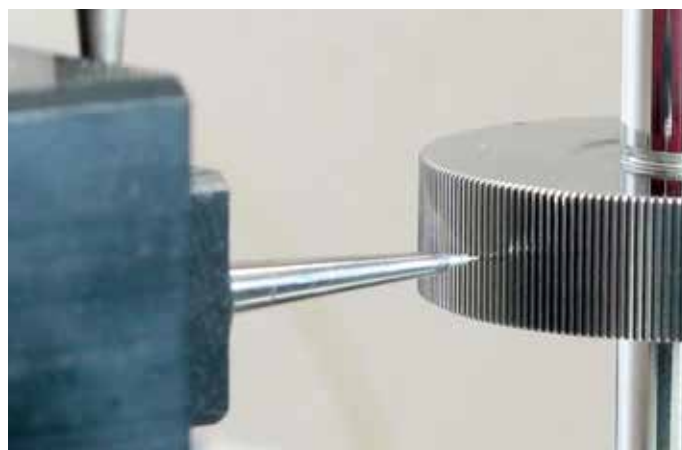
Features:

TTi-120H and TTi-150H are compact size machines while at the same time, they have superior high-precision measuring abilities with our own new measuring method "NDG".

Along with "NDG" method, Direct Drive Motor is introduced to their rotary shafts, which achieved world-class high speed and highly accurate measurement.

They also have an ability to measure both external and internal small module gears (m0.15) without changeover of right and left flanks.

TTi-120H and TTi-150H are capable of measuring small module gears with high accuracy measurement.

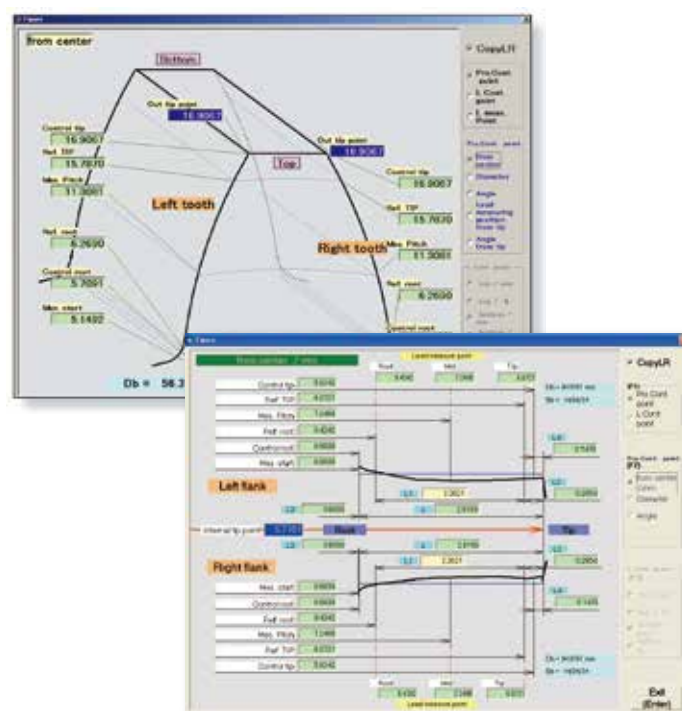


NC System

- BB-4, CNC system developed in house, achieved smart structure well designed for future expandability.

PC System

- Windows-compliant program allows advanced operational performance and facilitates data analysis.
- Easy communication with other media (LAN-compatible, TRS)



World Top Class in high speed measurement

- Our own new measuring method "NDG" achieved world's top class high speed measurement.

Small Module Gear Measurement

- Continuous Tooth profile / Lead / Pitch measurement of module 0.2(0.15) gear (External / Internal tooth) is possible without switching right and left flanks.
- With compact camera, interference of feeler is prevented by checking an enlarged image of tooth space before starting measurement with it.

Communication Environment

- Conventionally, RS-232C is used for alternate communication between PC and measuring machine, but by using USB, we could establish an environment of high-speed communications. Real-time condition of machine operation can be checked even during measurement of gears.

Symmetric construction

- Each axis is designed symmetrically against center of the bed to increase stability of measurement.

Software

- Software is developed with a focus on usability to comply with opinions and requirements from a customer.

Mirror finishing for wear and abrasion resistance

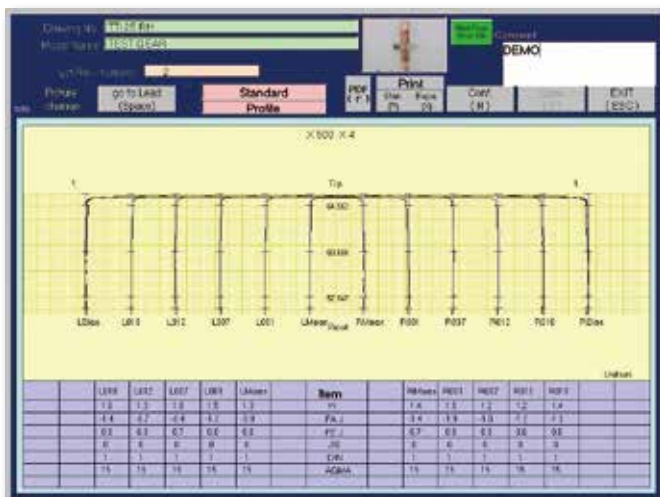
- All sliding surfaces are processed with mirror finishing job to increase wear and abrasion resistance.

Easy clamping mechanism

- New clamping mechanism moves upper center up and down easily by manual.
- Work is set on the machine just by moving center parts up and down.

Software environment

- Measured data conversion to PDF
- Display and output of the work measurement position
- Entry of comments such as measurement conditions & processing conditions
- Enlarged output



Measurements of the tooth profile, lead and pitch of spur, helical and internal gear

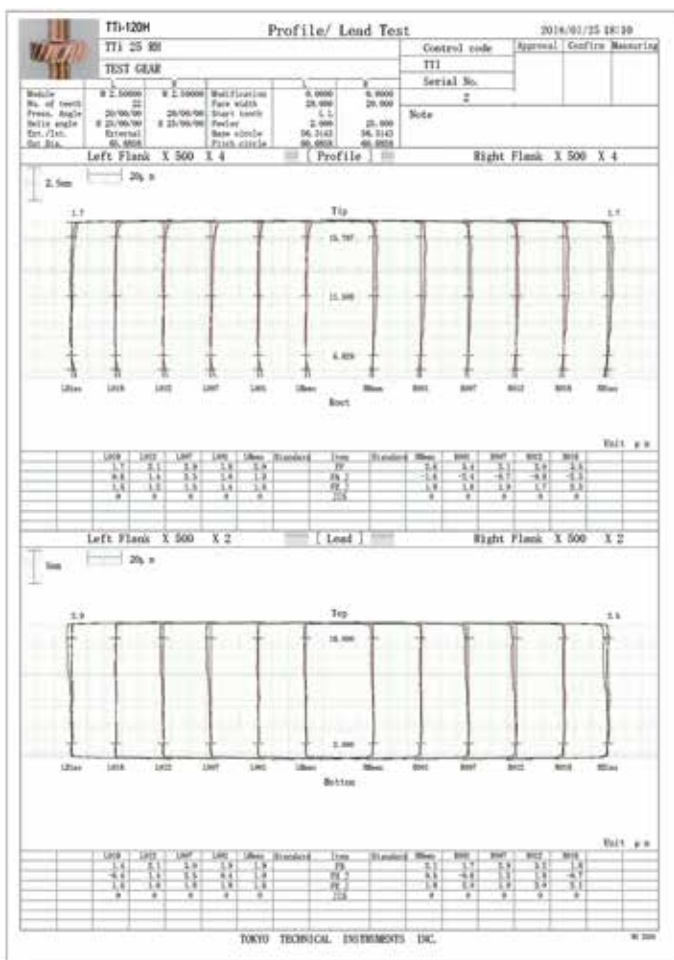
【 Measuring mode 】

- Standard measurements : Division into 1 to 4 measurements
- All teeth measurements : 1 to all measurements
- Pitch measurements : Specified to all teeth measurements
- Internal measurements : 1 to all measurements
- Division into three measurements : 1 to all measurements
- Bias measurements : Division into 1 to 4 measurements

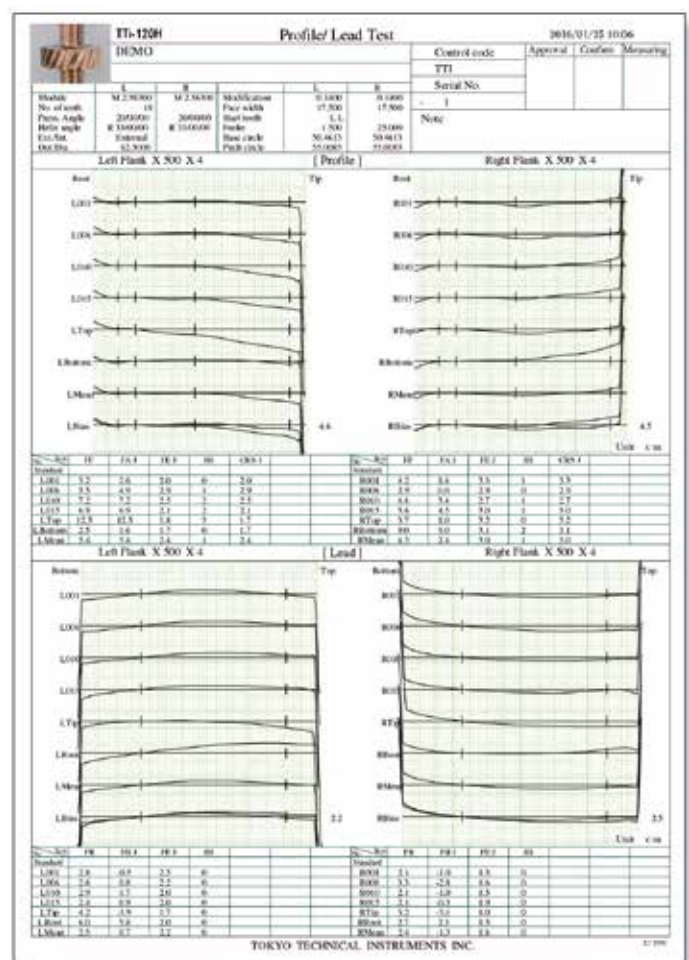
【 Judgment items 】

Standard software evaluates in compliance with the following various standards.

- JIS
- New JIS
- DIN Standard
- ISO Standards
- AGMA Standards
- GB/T Standards



<Standard mode>



<All teeth mode>

Contents of measurement

Cluster gear Measurement

Fully-automatic measurement of Cluster Gear (up to 10 gears) is possible.

Measuring Tooth Set up Monitor

- Measuring tooth can be set freely.
- In measuring intermittent teeth such as sector gears, teeth to be measured are easily set up.



Self-diagnostic program

[Self-diagnostic]

Standard software has self-diagnostic program.
Self-diagnostic will be done full automatically on all items.
The measurement result is saved for re-output.

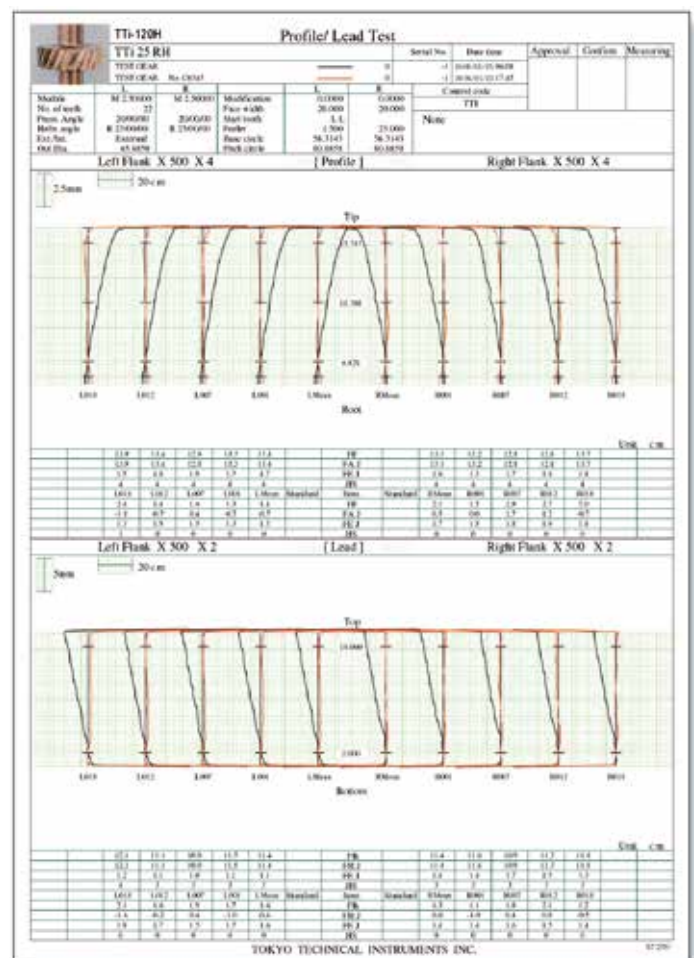
- Static accuracy check of each axis
- Optical scale count check
- Backlash check of all axes
- Each limit switch check

TTI-120H		Diagnostic Table		Date & Time 2016/01/25 21:48	
Machine No. W6 2513		Approval		Confirmation	
Mandrel No. p 30 x 400L		Operator			
Check Point 35 > 365					
Mandrel No. NO 2502					
Feeder Dia. h 2 x 25L					
Test Item	Range	Result	Unit	ORNG	
1. ADR flank switching	(+0.120 ± 0.000)	ADR = +0.132	mm	OK	
2. ADR L flank switching	(+0.120 ± 0.000)	ADR = +0.131	mm	OK	
3. X-X stroke	(± 0.01)	X-X = 0.0047	mm	OK	
4. Y-Y stroke	(± 0.01)	Y-Y = 0.0033	mm	OK	
5. ADR GAIN	(0 ± 5%)	ADGX=96, ADGY=95, ADGZ=90	%	OK	
6. Upper eccentric			mm	OK	
7. Lower eccentric			mm	OK	
8. Y Axis			mm	OK	
9. X Axis			mm	OK	
10. X stroke	(150.0 ± 5.0)	XSTROKE = 150.0620	mm	OK	
11. Y stroke	(100.0 ± 5.0)	YSTROKE = 100.0541	mm	OK	
12. Z stroke	(400.0 ± 5.0)	ZSTROKE = 400.165	mm	OK	
13. X stroke	(300.0 ± 1.0)	XSTROKE = 300	deg	OK	
14. X backlash	#(0)	XBL 1 = 0.0019, XBL 2 = 0.0022, XBL 3 = 0.0017	mm	OK	
15. Y backlash	#(0)	YBL 1 = 0.0007, YBL 2 = 0.0013, YBL 3 = 0.0014	mm	OK	
16. Z backlash	#(0)	ZBL 1 = 0.0017, ZBL 2 = 0.0019, ZBL 3 = 0.0019, ZBL 4 = 0.0015	mm	OK	
17. X backlash	#(0)	XBL 10 = 0.0004, XBL 20 = 0.0005, XBL 30 = 0.0005, XBL 20 = 0.0006	deg	OK	
18. Z upper		SW1 = OK		OK	
19. Z lower		SW2 = OK		OK	
20. Y this side		SW3 = OK		OK	
21. Y opposite side		SW4 = OK		OK	
22. X back		SW5 = OK		OK	
23. X front		SW6 = OK		OK	

<Self-diagnostic mode>

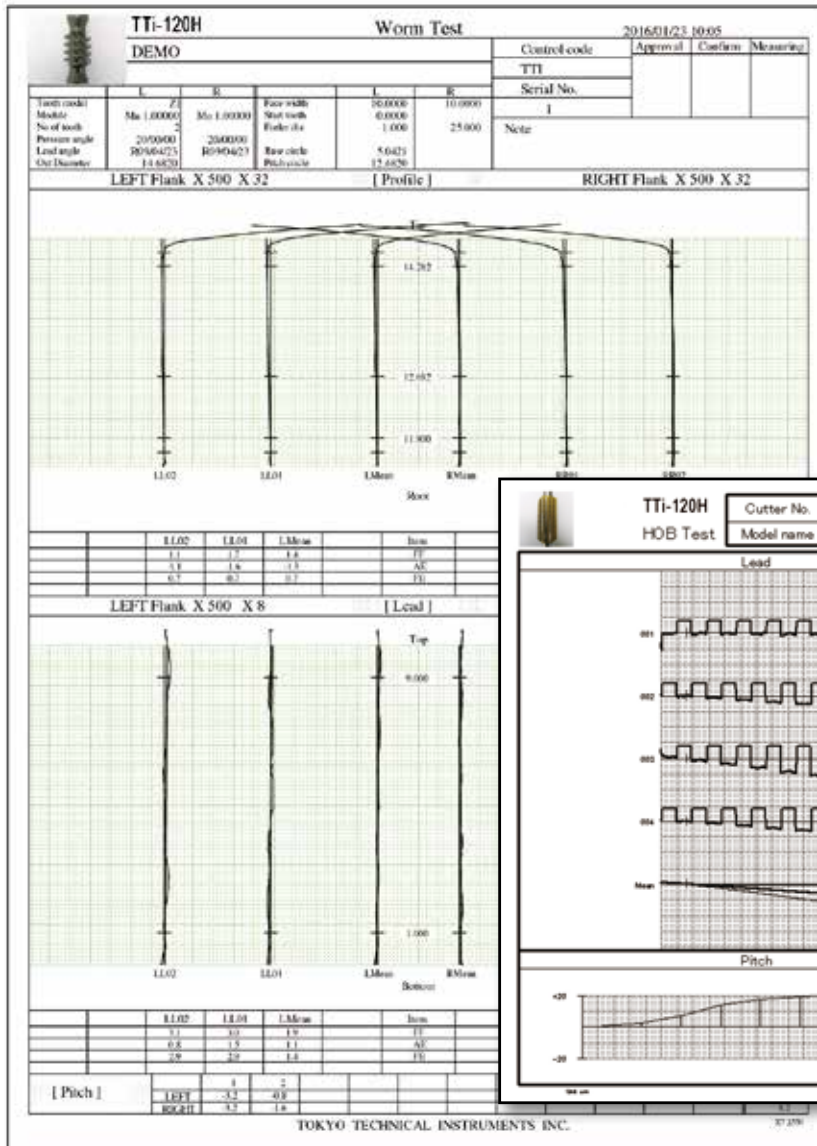
Comparative Output

- After saving measuring result to PC, data comparison between current and previous results is possible.
- Change amount between before and after heat treatment is compared with analysis.

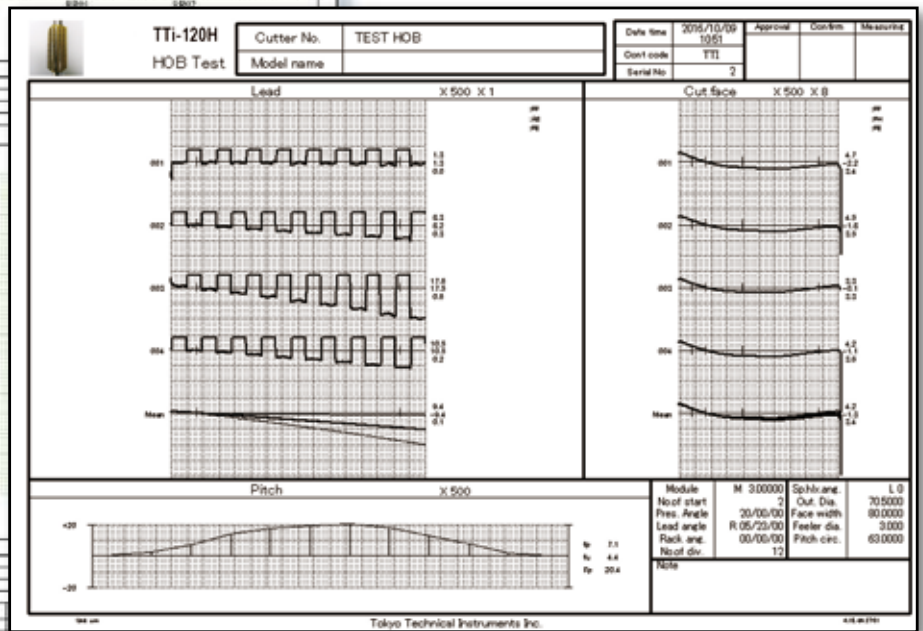


<Compare mode>

Option program



- Special gear and gear manufacturing tools are measurable.
- The measurement of Cutter face, Lead & Pitch on Hob Cutter is available
- Software developments are available for various requirements.



<Hob cutter mode >

<Worm mode >

Specifications

	TTi-120H	TTi-150H
Test item	Spur/Helical gear internal gear profile, lead, pitch	
Measuring system	"NDG" measuring system	
Measurement module	m0.2(0.15)~12	
Base circle dia	φ 120mm(Outer diameter φ 130)	φ 150mm(Outer diameter φ 160)
Helix angle	±65° (90°)	
Gear width	200 mm Max	
Shaft length	10~260(350) mm	
Max gear weight	20 kg Max	
Drive system	Constant-current drive	
Machine weight	650 kg	
Power supply	AC 100V 50 /60 Hz 15A	
Measurement accuracy	0.1μm	

● Standard accessories

Electrical hardware (BB-4 system)	1 set
Software for testing tooth Profile / Lead / Pitch	1 set
Stylus (ϕ 0.5, ϕ 0.7, ϕ 1.0, ϕ 1.25, ϕ 1.5, ϕ 2.0)	1 set
Test gear	1 pc
Work driver & fork	1 set
Tools	1 set
Operation manual	1 set
Inspection report	1 set

Peripheral equipment



● Optional accessories

■ Worm detector	■ Special center
■ Long support (350mm)	■ Special stylus
■ Floating table	■ Compact camera
■ Internal holder	■ Peripheral equipment



Internal measuring

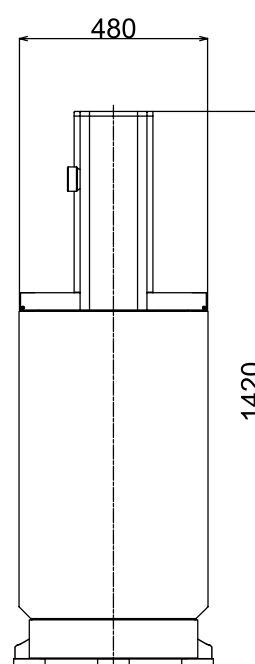
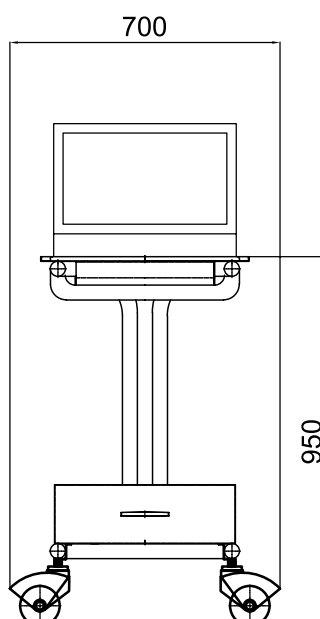
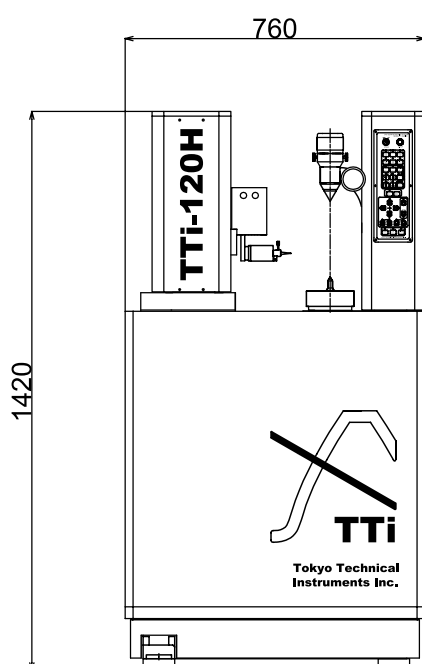


Compact Camera

- Enlarged & Displayed small module gear make it easier for you to place a feeler in position.



Dimensions



TTi-120H / 150H



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ISO9001 認 証 取 得



組 織 名 足利工場

対象範囲 CNC歯車試験機の設計
開発から製造販売まで