TURNING CENTER

ST200/250

INSTRUCTION MANUAL

79 SPECIFICATION

SEICOS - pcFlexi

Version 1.01 BS-1782-1-0300-E-1-01

Hitachi Seiki Deutschland
Werkzeugmaschinen GmbH

Introduction

Thank you for your having purchased the machine, favoring our product lines for your use.
This manual contains fundamental information on the specification. Please read and fully understand the contents for your safe machine operation.
In particular, the contents of the items concerning safety in this manual and the descriptions on the “caution plates” attached to the machine are important. Please follow the instructions contained and keep them always in mind to ensure safe operation.
The reference record papers on adjusting setting values such as a parameter list are attached to the machine unit and enclosed in the packing. These are necessary for maintenance and adjustment of the machine later on. Please keep them safely not to be mislaid.
The design and specifications of this machine may be changed to meet any future improvement. As the result, there may arise some cases where explanations in this manual could become partly inconsistent with the actual machine. Please note this point in advance.
In this manual, items on the standard and optional specifications are handled indiscriminately. Please refer to the “delivery note” for the detailed specification of your machine confirmation.

CONTENTS

1. GENERAL PRECAUTION

General descriptions is very useful for making working environment against accidents and increase productivity.

1. Be sure to put safety goggles on.
2. Be sure to put safety shoes on.
3. Operate with proper dressing, such as putting a utility cap on, fixing the sleeves and the cuffs of working clothes.
4. Don't operate the machine with gloves.
5. Make clean and neat environment by lighting up and keeping dry around the machine. Also don't put any obstacles.
6. Remove dust and chips on the machine, high voltage control panel and NC unit. Also remove them on the floor. Avoid using compressed air as much as possible for these cleanings.
7. Use a strong enough table to be put around the machine, and take anti-sliding measures on the surface.
8. Don't put tools, workpieces, and other items on the machine as well as on the moving parts of the machine.
9. Don't give any remodeling to the machine without our permission.

1-1 Precautions on Machine Operation

When conducting trial run, read the manual applied to the machine carefully for full understanding beforehand. Witness of our operation instructor is most preferable.

Maintenance

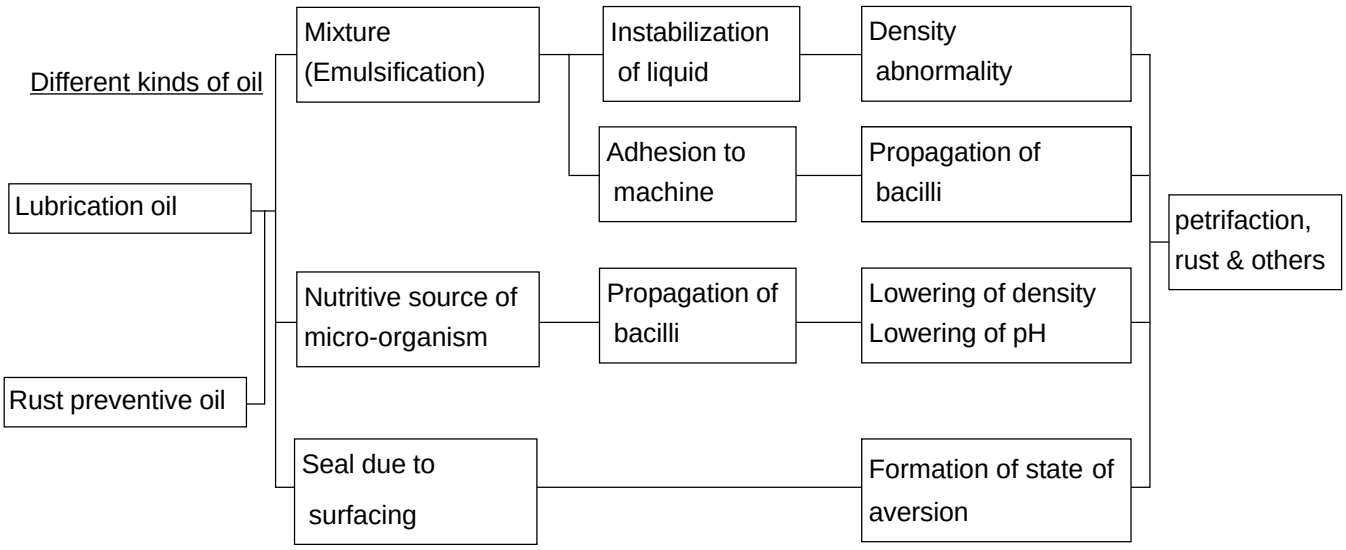
1. An operator and maintenance personnel should read the precautions on the caution plate fitted to the machine and observe them.
   Don't stain, damage or remove the caution plate becomes hard to read, contact Hitachi Seiki.
2. Close all the doors and covers except when adjusting work is made.
   As for the doors of the NC unit and the power control cabinet, be sure to close them with special care.
3. Don't remove or modify the limit switches for the stroke end, for the travelling axes and the mechanism, or the electric circuit employed for safety.
4. Use regular wrenches and spanners for adjusting or repairing work.
5. When repairing the machine, be sure to perform lock-out or tag-out so that power switch may not be operated.

Coolant

This machine doesn't mix coolant with lubrication oil by using the economy pack. But, the soluble cutting fluid is decomposed due to the factors such as propagation of micro-organisms, which causes various troubles by lowering cutting and rust prevention performance.

When using soluble cutting fluid, care must be taken of the following points.

1. When selecting soluble cutting fluid, carefully consider lubrication, infiltration, rust prevention, bubble prevention, separability against oil and safety needs.
2. Before operation starts and after operation ends, not only remove chips, but also wipe off soluble cutting oil adhered to each slideway, the rotating parts, the saddle and cross-slide of the machine and then be sure to apply lubrication oil thinly to those parts.
3. Replace soluble cutting fluid immediately if it becomes vitiated.
4. Remove the covers every 6 months and clean each slideway, X, Y, Z axes ball-screws, each limit switch and feed motors etc.
5. As soluble cutting oil is considered for rust prevention, it may be no problem when the workpiece is wet. However, when dry, it is apt to rust.
   Therefore, it is recommendable to apply rust preventive oil before the workpiece dries after finished machining.
6. Since soluble oil is alkalescent and has a strong decreasing action, the operator is apt to develop dermatitis.
   Therefore, the operator should take appropriate precautions.
7. As for the diluting method and soluble cutting fluid, diluting water they are different depending on the type of soluble cutting oil, so use it in accordance with the recommendations of the cutting fluid manufacturer.
8. Since there are instances where extensive micro-organisms are detected in industrial water, it is recommendable either to check it before use as water for dilution or to use service water.
9. Do not use a chemical solution type (synthetic type) in water-soluble cutting agents, because it causes detachment of coating and affects sealing materials and resin materials adversely.
10. The influences of difference kinds of oil on coolant are as follows: Carefully monitor the condition the coolant fluid.



Operation

1. Be aware of the position of the push button for emergency stop so that the operator may be able to press it instantly.
2. As for the operation of the machine, proceed in accordance with the procedure described later.
3. During operation, keep hands away from the rotating sections and movable sect ions.
4. When disposing of chips that wound round tooling or fell onto the chip brow, etc. it is dangerous to grasp and pull them. Further, when disposing of chips, be sure to do it after stopping the machine.
5. When adjusting the position of the coolant nozzle, do it after stopping the machine.

Tool Setting

1. When setting up tools, stop a spindle as well as the feed in each axis.
2. Be very careful of tool length when setting them up. Do not set the tools over their specified lengths because their tool edges may interfere with a bed, carriage, cover, tailstock, etc. when indexing a turret.
3. Mount tools in a well balance condition. Due to high-speed turret indexing when their mounting is unbalanced, it may lead to improper turret indexing.
4. When setting a tool to the rotating tool, it is feared that the driving side may be damaged, if it is performed in the machine.
   Whenever tools are set, be sure to do it at the outside of machine.

Operation Finish

1. After operation of the machine is over, be sure to switch the power OFF in the prescribed order, clean the machine and apply rust preventive oil to each section of the machine such as the slide ways.
   When soluble cutting fluid is used, perform these jobs with special care.

1-2 Electric Equipment and NC Unit

When operating the machine or carrying out maintenance checks, pay special attention to the following points, concerning the electric equipment and NC unit.

1. Do not give shocks to the NC unit, power control cabinet and other machine parts.
2. For the primary wiring of the machine, use the cable size specified in the maintenance manual. Do not use an excessively long cabtire cable.
   When the primary wiring has to be put on the floor, protect it with a cover against damage by cutting chips and other sharp objects.
3. While test running the machine, be sure the setting parameter of the NC unit coincides with the parameter sheet attached to the machine.
4. Do not change the current set values of thermal relays in the power control cabinet, various control knobs or the parameter data.
5. Do not apply excessive force, e.g. bending force etc., to the connector portion of plugs, flexible conduits (tubes) or cabtire cables etc.
6. When carrying out maintenance checks on the electric equipment, at first, turn off the EMERGENCY STOP button on the operation panel, then turn off the power of the NC unit, the main switch of the power control cabinet and the power switch installed in your factory, in this order.
   Start maintenance work after making sure that these switches are turned off.
   Lock the power switches in the OFF state as much as possible or put up warning signs. In additions, place a “DO NOT TOUCH” tag near the operation buttons of the machine to forbid other personnel from operating the machine.
7. Handle electric equipment of the machine with particular care and exercise extreme caution not to allow the machine to get wet.
8. For equipment inside the power control cabinet, use those specified by Hitachi Seiki. Use always specified fuses. Never use fuses with a higher capacity.
9. Never leave the control cabinet door open, because direct sunshine or camera’s strobe flash rays may enter the cabinet and damage internal equipment.
10. In case of turning on the power again, execute power on went by equal to or more than two seconds after power turned off. If the power is turned on during discharge from control devise by power off, pay attention to the alarm of the machine is displayed some time, due to normal process is not available.

1-3 Workpiece Chucking

1. When chucking a workpiece, be careful of its balance. Do not turn the spindle if the mounting of the workpiece is unbalanced badly.
2. Use standard soft jaws. Mount the jaws so that they may stay within the outer diameter of the chuck.
3. To set pressure of chuck cylinder, determine it referring to “Chucking Pressure-Gripping Force Diagram”.
   Take note that the chuck gripping force will be suddenly reduced due to a centrifugal force when the spindle runs at a high speed.
4. When forming the soft jaws, pay full attention to a forming ring gripping position and a shape to which the jaws are to be formed.
   After forming, check that the jaws properly grip the workpiece and that a chucking pressure is adequate.
5. When chucking and centering a shaft work, take special note of a workpiece weight, a size of center hold and a thrust force.
   If a heavy workpiece is held with a small center hold and a load is applied, the tip of the center may be damaged, allowing the workpiece to jump out.

1-4 Weights and Measures Table

(Metric and English Conversion)

1. Liner measure

   1m (meter) = 39.37 inches = 3.2808 feet = 1.0936 yards

   1cm (centimeter) = 0.3937 inch

   1mm (millimeter) = 0.03937 inch

2. Square measure

   $1m^2$(square meter) =10.764 square feet = 1.196 square yards

   $1cm^2$ (square centimeter) = 0.155 square inch

   $1mm^2$ (square millimeter) = 0.00155 square inch

3. Cubic measure

$1m^3$(cubic meter)	= 35.315 cubic feet	= 1.308 cubic yards
	= 264.2 U.S. gallons	= 220.0 U. K. gallons
1 (liter, cubic decimeter)	= 0.0353 cubic foot	= 61.023 cubic inches
	= 0.2642 U.S. gallon	= 1.0567 U. S. quarts
	= 0.2200 U.K. gallon	= 0.02745 bushel
$1cm^3$ (cubic centimeter)	= 0.061 cubic inch	

4. Weight

1 ton (metric ton)	= 0.9842 U. S. (long) ton	= 2204.6 pounds
	= 1.1023 U. K. (short) ton	

   1 kg (kilogram) = 2.2046 pounds = 35.274 ounces avoirdupois

5. Others

1 kgf/cm^2 (kilogram force per square centimeter)	= 14.223 pounds per square inch	
	= 0.098 MPa (Mega Pascal)	
1 kg-m (kilogram-meter)	= 7.233 foot-pounds	

2. SPECIFICATIONS

2-1 Machine Outline

This is a NC lathe with a drum type turret head. It is designed to be able to control two axes simultaneously.

The following are the features of this machine.

1. The machine can perform chuck work and center work.
2. Infinite variable speed is available in wide range by application of AC inverter motor.
3. With a permanent tool setting as a basis, various kinds of workpiece can be machined without modification.
4. The machine also has a diagnostic function.
5. Due to the combined structure of electric and mechanical systems.
   A required floor area is reduced.

In addition, the turret head is positioned in the rear of the machine in order to improve accessibility to the spindle and the operatability of the machine.

If optional accessories are attached, the working range of the machine can be extended further.

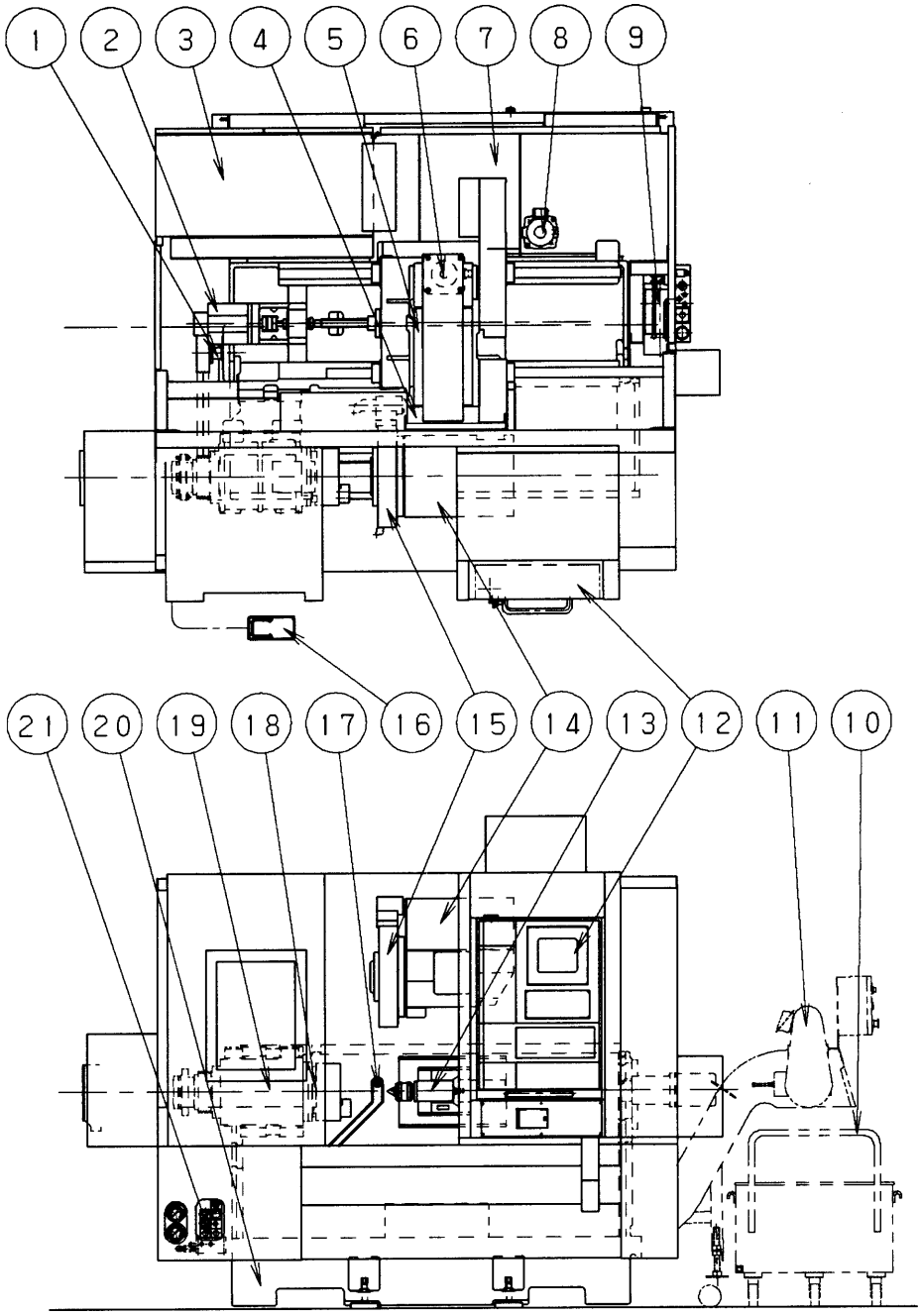
Construction of Machine Proper

1. Head stock
   By a AC motor, variable speed in wide range
   [HT200/ST200 50 ~ 5000min^{-1}]
   [HT250/ST250 42 ~ 4200min^{-1}] is made available automatically.

2. Tool post
   By adopting a particular coupling method, higher indexing accuracy is guaranteed.
   The servo motor drives indexing action and hydraulic pressure is used for clamping which gives the machine certainty of the action.

3. Tailstock
   The taper of the tailstock is MT No.5, and any live center on the market can be mounted.
   Tailstock can be set at any position on the supporter by key operation. The thrust force can be adjusted by oil pressure within the range of 490~7350N.

2-2 Component Units



1	Spindle motor	7	Coolant tank	13	Tailstock	19	Headstock
2	Z axis feed motor	8	Coolant pump	14	Tool post	20	Bed
3	High voltage distribution board	9	Oil pressure unit	15	Turret	21	Chuck/tailstock pressure adjustment manifold
4	Cross slide	10	Chip box (OP)	16	Foot switch for chuck opening/closing		
5	Saddle	11	Chip conveyor (OP)	17	Q setter		
6	X axis feed motor	12	Operating panel	18	Spindle		

2-3 Machine Specifications

1) Machine Specifications

Specifications		Unit	Standard Specification	
			HT200/ST200	HT250/ST250
Capacity	Swing over bed	mm	680	
	Chuck outer diameter	mm	500	
	Max. machining diameter	mm	220	254
	Max. machining length	mm	490	470
	Bar capacity	mm	70	80
Stroke	X axis	mm	260	
	Z axis	mm	520	
Spindle	Spindle speed	min^{-1}	50~5000	42~4200
	Spindle speed range	Step	Infinite	
	Spindle nose (Type, No.)	JIS	A2-6	A2-8
	Diameter of spindle through hole	mm	80	95
	Spindle bearing inside diameter	mm	120	140
Turret head	Type of turret		12 station variable	
	No. of tool position	pcs.	12	
	Shank height of square bite	mm	25	
	Shank diameter of boring bar	mm	40 (B/H hole dia. 50)	
Feedrate	Rapid traverse X axis	m/min	40	
	Rapid traverse Z axis	m/min	40	
	Cutting feedrate (Per revolution)	mm/rev	0.001~1000	
	Jog feed	mm/min	0~5000	
Tailstock *1	Stroke of tailstock	mm	550	
	Type of tailstock spindle taper hole		MT-5	
	Method of tailstock travel		Power operation	
Motor	For spindle motor (50%ED/continuous)	AC-KW	12/6	18.5/6
	Axis feed motor X axis	AC-KW	2.9	
	Axis feed motor Z axis	AC-KW	2.9	
	For turret indexing	AC-KW	1.3	
	For Toilstock	W	150	
	Oil pressure pump	W	400	
	For cutting and chip washing	W	180	
Power source	Power supply	KVA	15	18
Machine weight		Kg	4850	4950

*1 The system is structured in such a way that by operating command, the tailstock moves forward, back ward and in forward inching mode within the whole range of the stroke.

2) Main Accessories

Standard Accessories

Hyd' hollow chuck (HT200/ST200 : ϕ220, HT250/ST250 : ϕ254)

Soft jaw

One-touch tailstock (Tailstock)

Q-setter

Flood coolant (Chip wash coolant)

Splash cover

Operator side door interlock

Spindle speed meter on screen

Spindle load meter on screen

Spindle/feedrate override

Call light (Std. Yellow)

Electric leakage detection breaker

Machining completion pre-call/Work counter/
Run hour display on screen

Work light

Leveling block

Spanners and wrenches

Chuck op. By M-code

Tailstock op. By M-code

Optional Accessories

1. NC tailstock
2. C-axis control
3. X-axis scale feedback
4. 12 st. QCT(KV) turret
5. 12 st. VDI turret
6. 12 st. VDI rotating tool turret
7. Builtin type tailstock
8. Chip conveyor, Right / Rear type
   Flat / Scrape with Roring filter / Magnet scrape
9. Chip conveyor with intermittent feed
10. Chip wagon with roller
11. Jet coolant
12. Gun coolant
13. Chuck overhead coolant
14. Mist collector
15. Collet chuck
16. Chuck open/close confirmation
17. High/low 2-step pressure chucking
18. Tailstock operation by foot pedal
19. Inside spindle work stopper
20. Face driver anti-powerfailure
21. Spindle positioning dev., 1 position, electric
22. Auto door
23. Bar feeder
24. Bar puller
25. Parts catcher
26. Spindle end coolant collector for bar feed att.
27. Separate type spindle speed meter
28. Separate type counter A/B/C
29. Additional call light
30. Automatic power cut-off device
31. Separated start/stop/emergency button
32. Separated start/stop button
33. Z setter
34. Auto presetter & Q-setter, tool breakage detection
35. Inside machine work measuring equipment
    For Chuck work (X/Z) / Center work (X)
36. Transformer 45KVA
37. Preliminarily E/L application

* The contents of accessories and equipment are subject to change without notice. Please contact the sales department of Hitachi whenever you have any inquiry for answer.

2-4 NC Unit Specifications

Refer to the NC unit specifications list of SEIKI SEICOS instruction manual (operation section) for details of specifications.

Item	Standard specification	
1	Controlled axis	2 axes, 2 axes simultaneous
2	Least input increment	0.001mm/0.0001”
3	Interpolation	Positioning, Linear, Circular
4	Inch/Metric conversion	
5	Tape code	EIA/ISO auto.recognition
6	Designation	INC./ABS.
7	Decimal point programming	
8	Buffer register	
9	Feedrate command	F code/feedrate direct
10	Rapid traverse override	0, 1, 10, 50, 100%
11	Feedrate override	0~200%
12	Spindle override	50~150% (10% step)
13	Threading function	F/E code direct
14	Manual feed function	Rapid, Jog feed, Handle
15	Manual pulse generator	×1, ×10, ×100 (inch=×50)
16	Part program storage	1000m/1 directory Total 1000m(1000m × 10 directories)
17	Add. registered programs	100 pcs./1 directory Total 1000pcs. (100pcs. × 10 directories)
18	Back ground editing	
19	Extended program edit	(Program copy)
20	Display	10.4" color TFT
21	Memory lock	
22	Language display	English/German
23	I/O interface	RS232C*1
24	I/O interface	PC card (PCMCIA I/F)
25	Function	G3, M3, T4, O8 digits
26	Spindle speed command	S code/speed direct
27	Constant surface speed control	
28	Automatic tool nose radius compensation	
29	Grooving width offset	(ID, OD, Face)
30	Tool offsets	32 sets
31	Q-setter repeat function	
32	Cutting point coordinate system setting	
33	Reference point return	Manual, Auto G28
34	2nd reference point return	G30
35	Graphic display	Before and synchronized machining

Item	Standard specification	
36	Program comment	16-character
37	Single block	
38	Block skip	1 pc.
39	Optional stop	
40	Program check function	Dry run + Spindle stop + coolant stop
41	Machine lock	
42	Program number search	
43	Sequence number search,	
44	Program comparison	
45	Manual absolute	[ON] fixed
46	Flexi macro	Common variable 100 pcs.
47	Soft jaws forming function	(by graphic)
48	Fixed cycle	G90, G92, G94
49	Multiple repetitive cycle	G70~G76
50	Mirror image	G501 G511
51	Radius designation on arc	
52	Exact stop	G09 G61 G64
53	Programmable data input	G10
54	Backlash compensation	
55	Run hour display/Spindle speed display	(On screen)
56	Cycle completion pre-call / Cycle time display / Work counter	(On sxreen)
57	Following up	
58	NC flight recorder	
59	Stored stroke limit 1.2.3	
60	Strock check before move	
61	NC self diagnostics	
62	Customizing screen	
63	User screen	

*1 Interface only.
Not include cable.

Item	Optional specification	
1	Direct tapping	(Rotating tool)
2	Variable lead threading	
3	Thread cutting cycle retract	
4	Multiple start thread cutting	
5	Flexi macro	Common variable 200 pcs.
6	Flexi macro	Common variable 300 pcs
7	Flexi macro	Common variable 600 pcs.
8	Drilling cycle	(Incl. in rotating tool) G80~89
9	Cutting doubler	
10	Spindle positioning	(Minimum inc. 0.001°)
11	Macro print function	(Need printer w/ RS232C I/F) *1
12	Part program storage Add. registered programs	Total 100000m (1000m × 100 directory) Total 10000 pcs. (100 pcs. × 100 directory)
13	Tool diameter compensation	(Rotating tool)
14	Tool offsets	Total 64 pcs.
15	Tool offsets	Total 99 pcs.
16	Tool offsets	Total 200 pcs.
17	3rd-4th reference point return	
18	Program comment	64-character
19	Block skip	Total 8 pcs.
20	Angle program for linear interpolation	
21	Cylindrical interpolation	(Incl. tool diameter compensation)
22	Polar coordinate interpolation	(Incl. tool diameter compensation)
23	I/O interface	RS232C 2ch
24	UUP	(Universal user port)
25	Tool life management/Spare tool call	
26	Each program, cycle time display	10pcs.(On screen)
27	Each program, cycle time display	50pcs.(On screen)
28	Cutting monitor	(Incl. tool life management (Count only)/Spare tool call)
29	NC chuck function	(Incl. with NC chuck option)
30	NC tailstock function	(Incl. with NC tailstock option)
31	C-axis control	
32	Super multi interactive system Shape input method Automatic determination function Automatic process	3D-simulation List & symbol input Machining method/ mashining area/ Process/ Tool/ Tool position/ Cutting condition/ Tool path interference/ Tool path Turning process: 21 process Machining process: 8 process

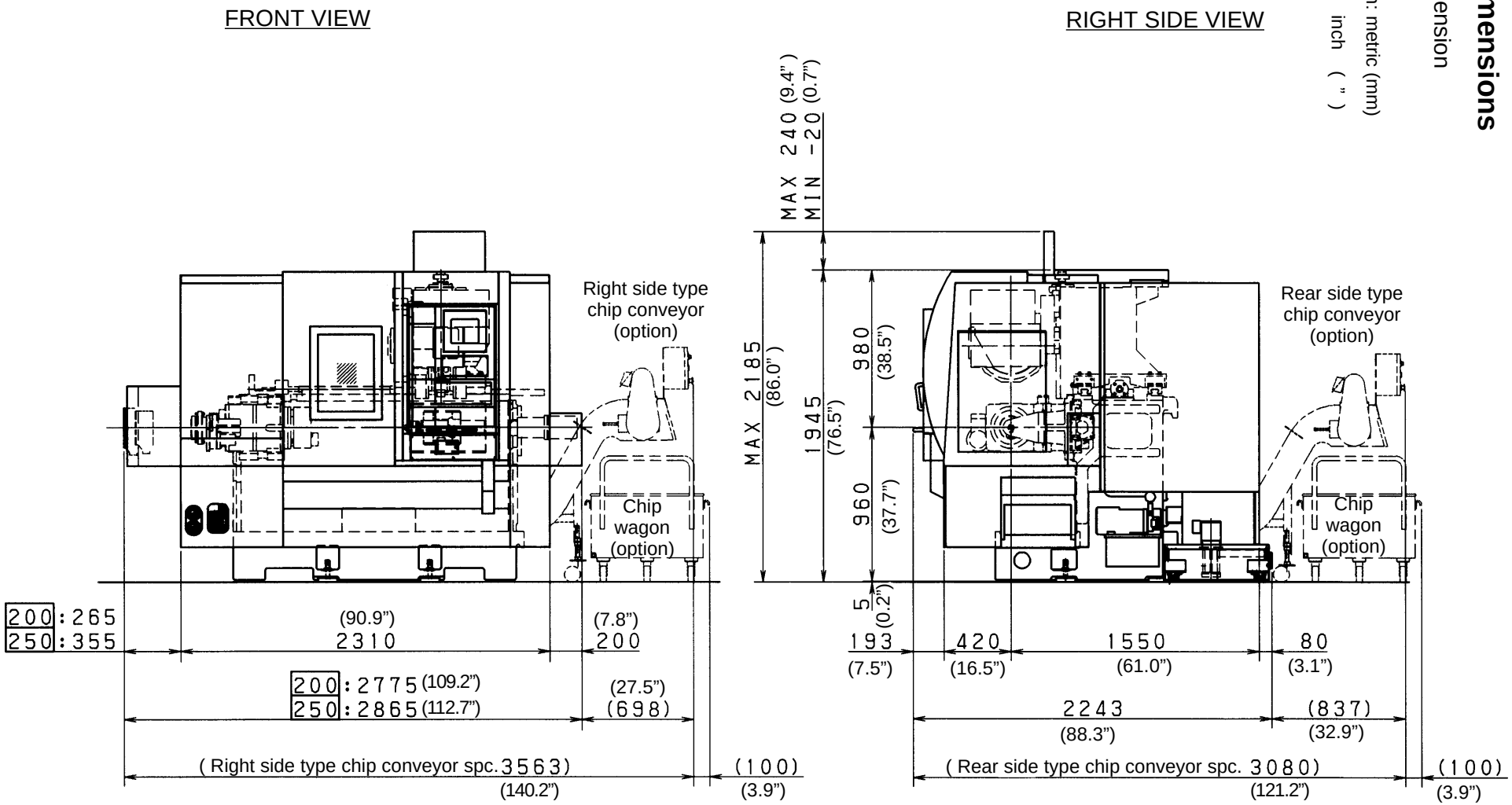
Item	Optional specification	
	Automatic program	NC data/ Tool/ Position of tool/ Cycle time
	Dynamic graphics	Automatic graphics
	Editing	Confirmation method/ NC data editing
	Data saving/ Input, output	NC data/ Shape data/ I/O to NC machine

*1 Interface only.
Not include cable.

2-5 Major Dimensions

1) Major Dimension

Dimension: metric (mm)
inch (")

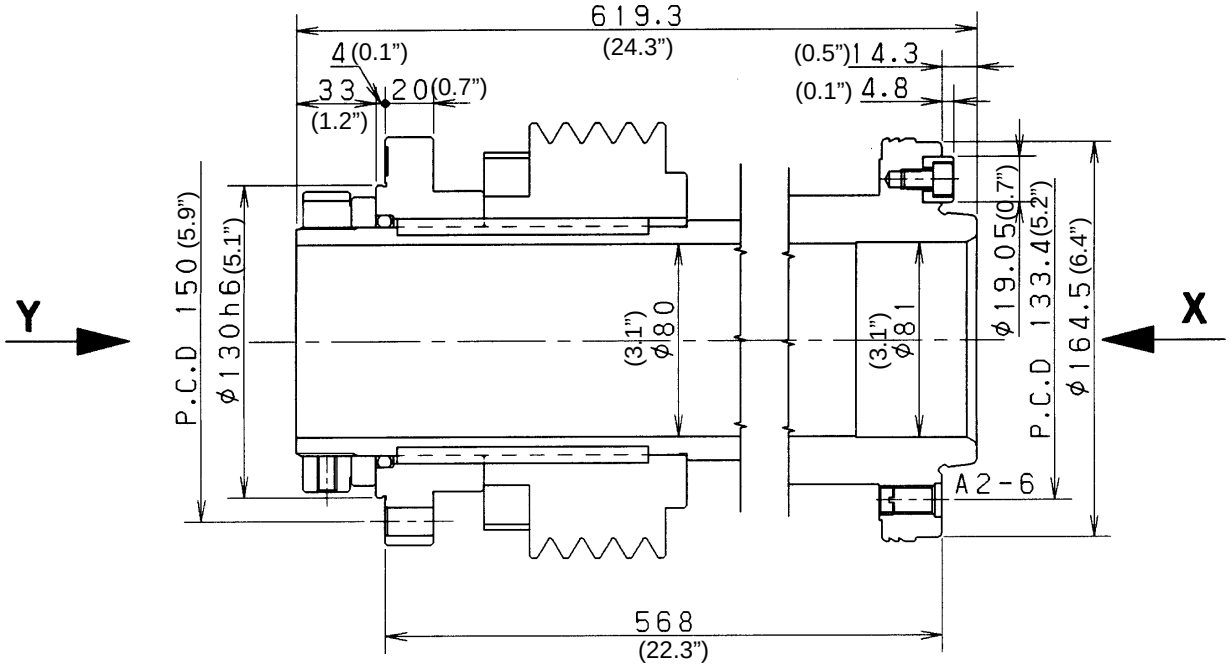


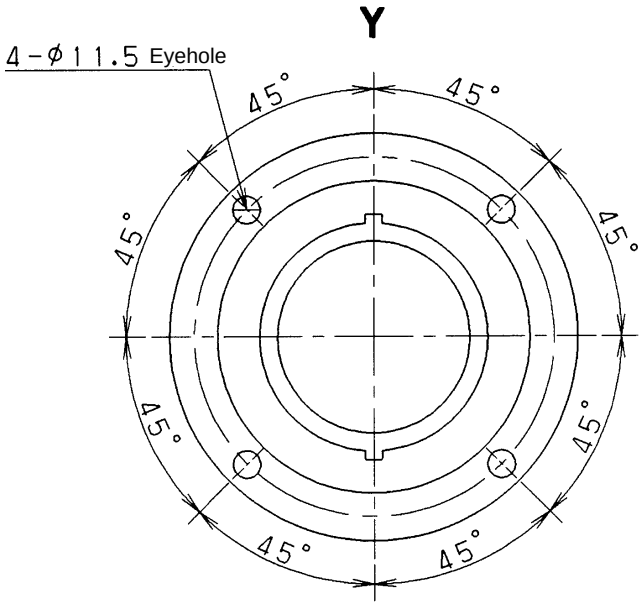
2) Spindle

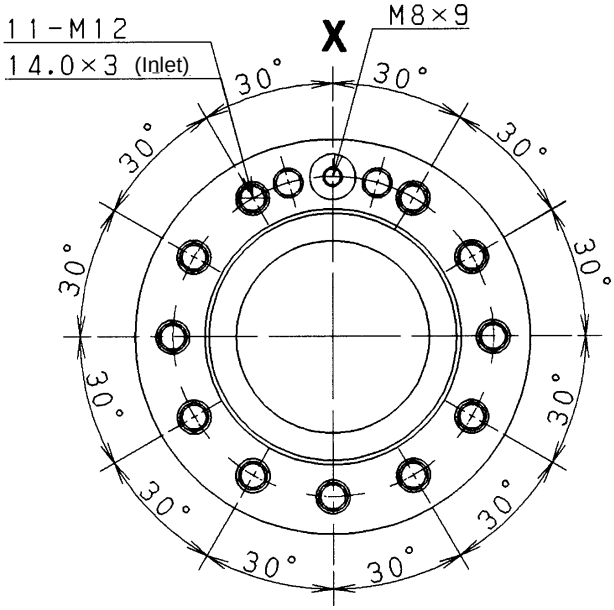
HT/ST200

Dimension: metric (mm)

inch (")



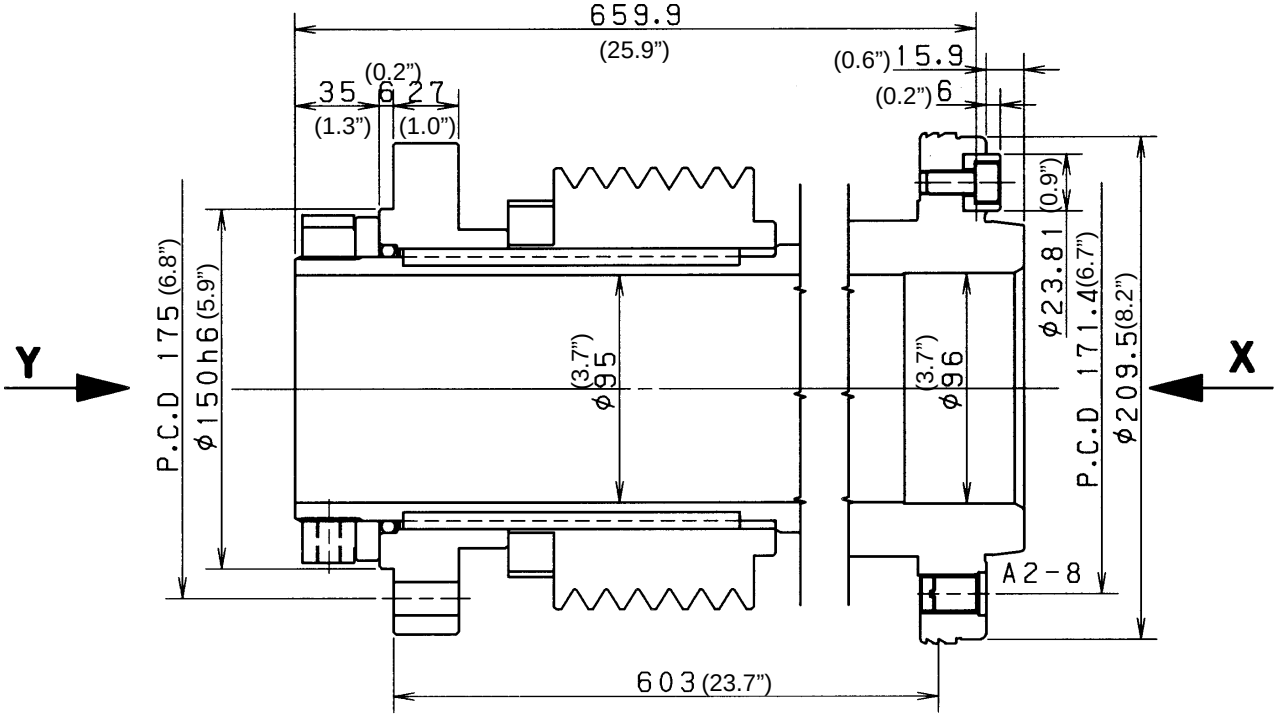


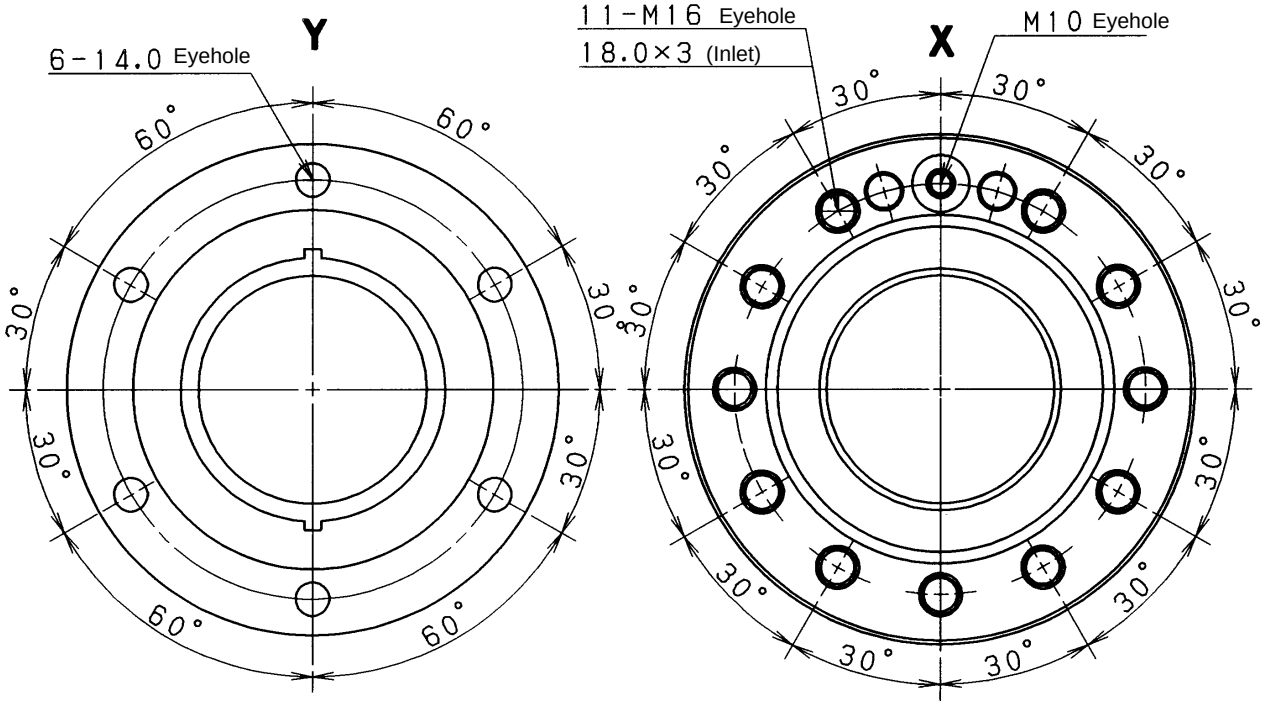


HT/ST250

Dimension: metric (mm)

inch (”)

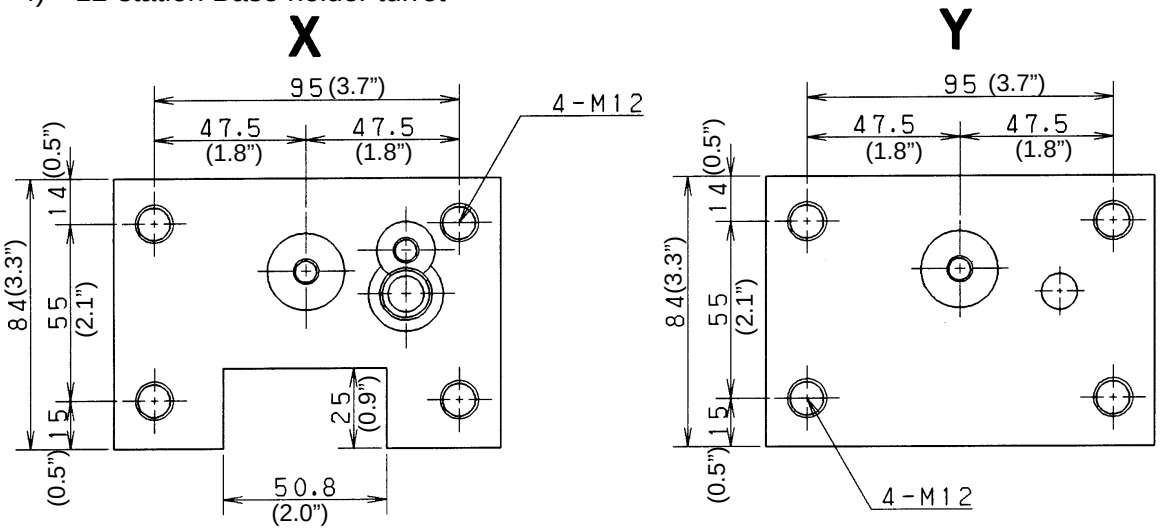




3) Tool Post List

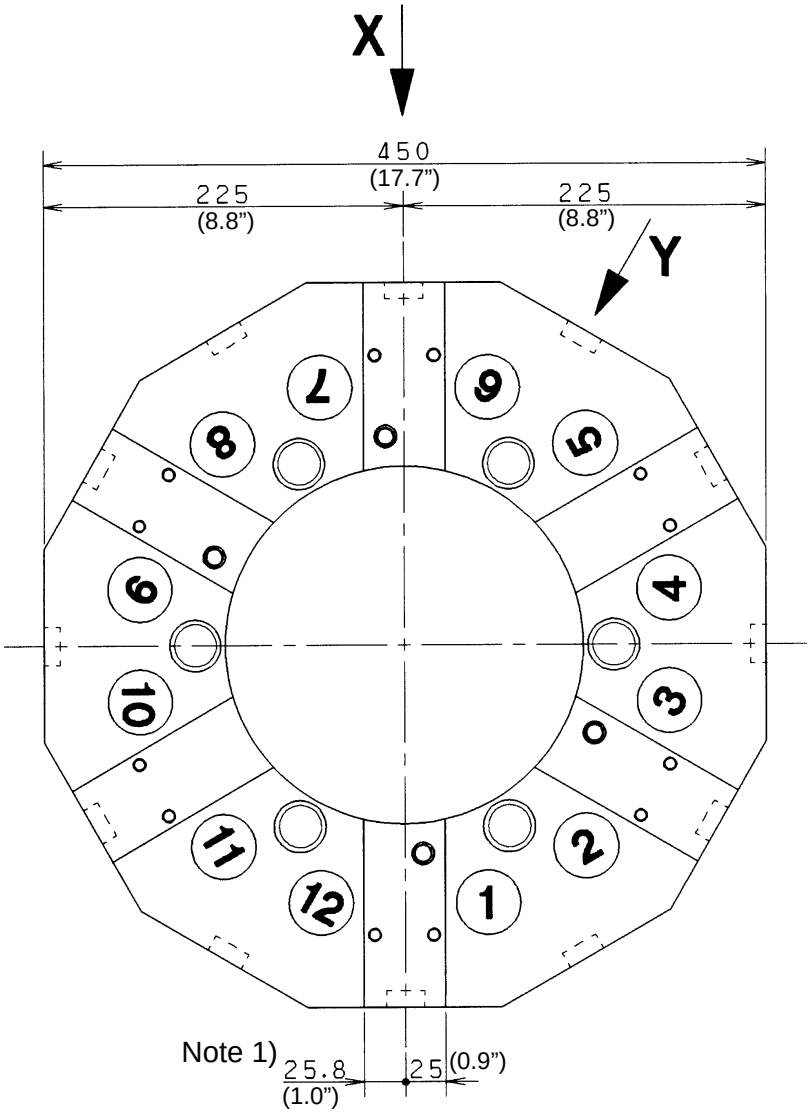
No.	Tool post
1	12-station Base Holder
2	12-station QCT(KV)
3	12-station VDI
4	12-station VDI rotaring tool

4) 12-station Base holder turret

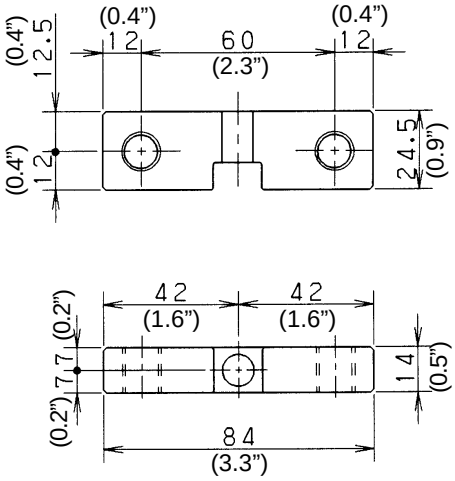


Dimension: metric (mm)

inch (")



Turret



Piece

Fixture screw

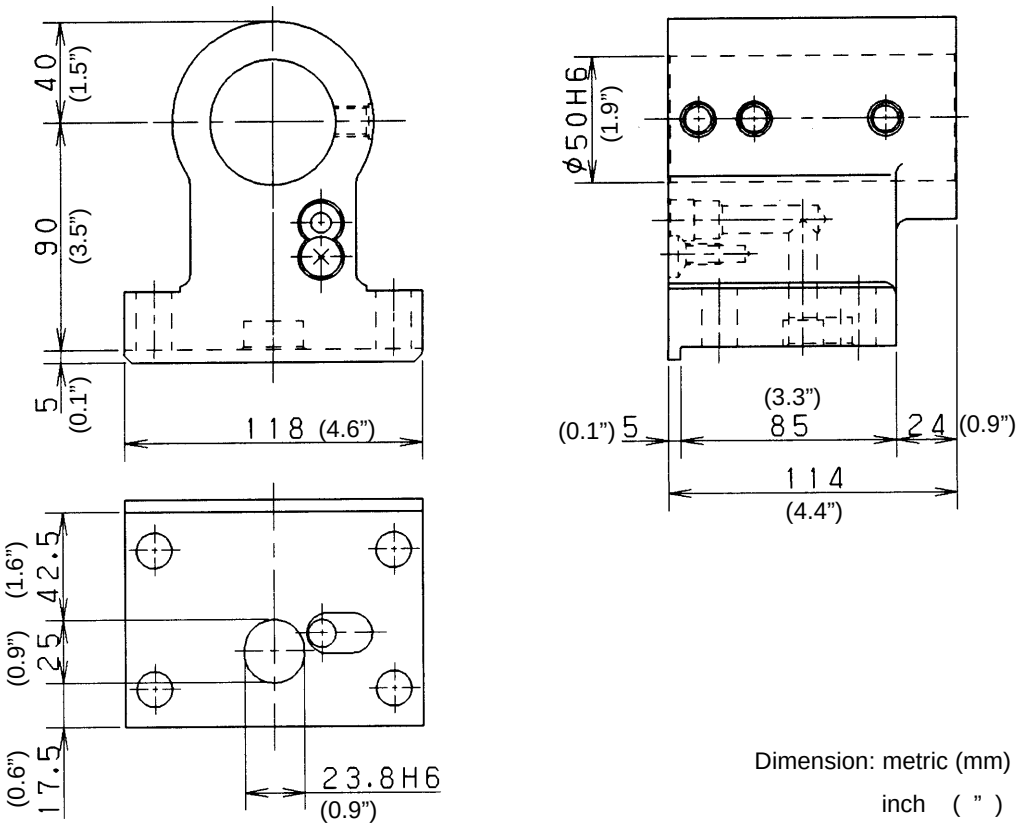
Hexagon socket head

cap screw M8×25

***Note** 1) For reverse turn cutting, use 0.8mm spacer for re verse turn cutting (2 pieces standard accessory)*

5) Base Holder

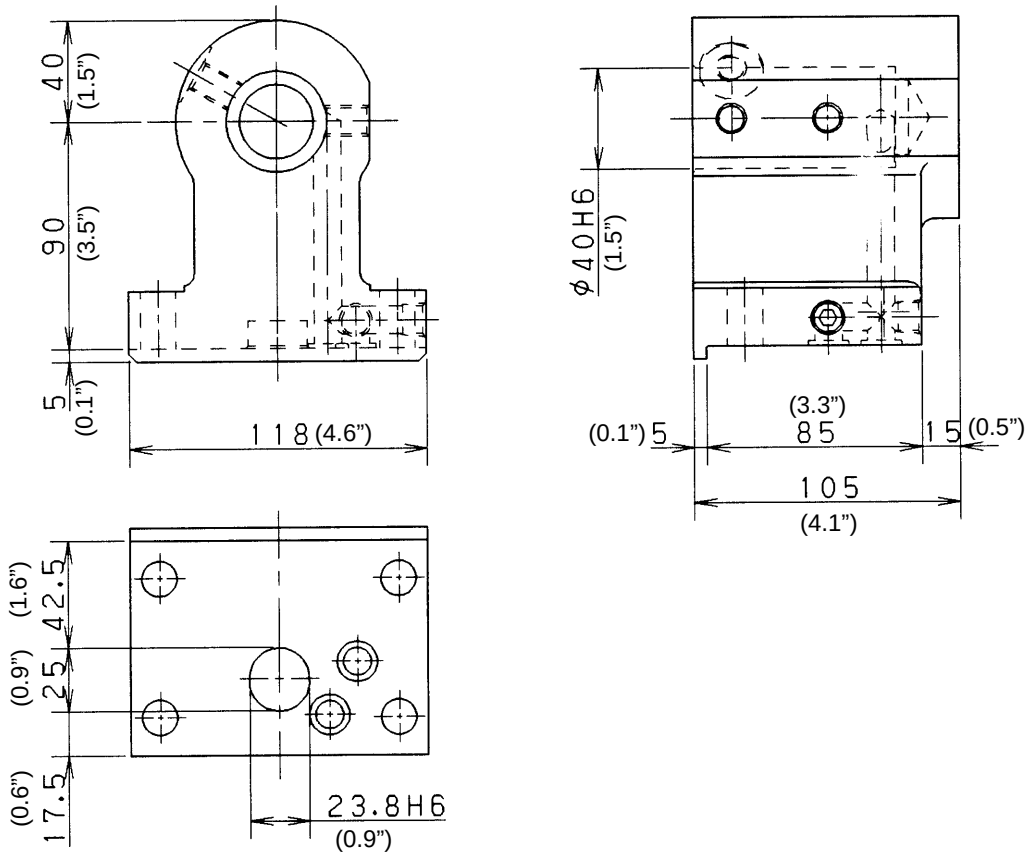
Base holder for boring



Dimension: metric (mm)

inch (")

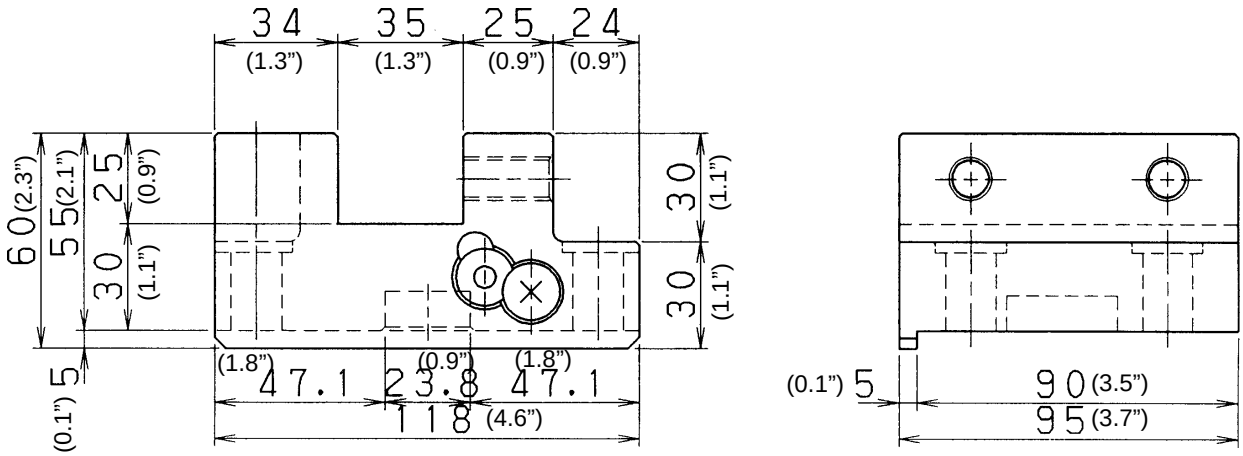
Base holder for U drilling



Base holder for end face grooving

Dimension: metric (mm)

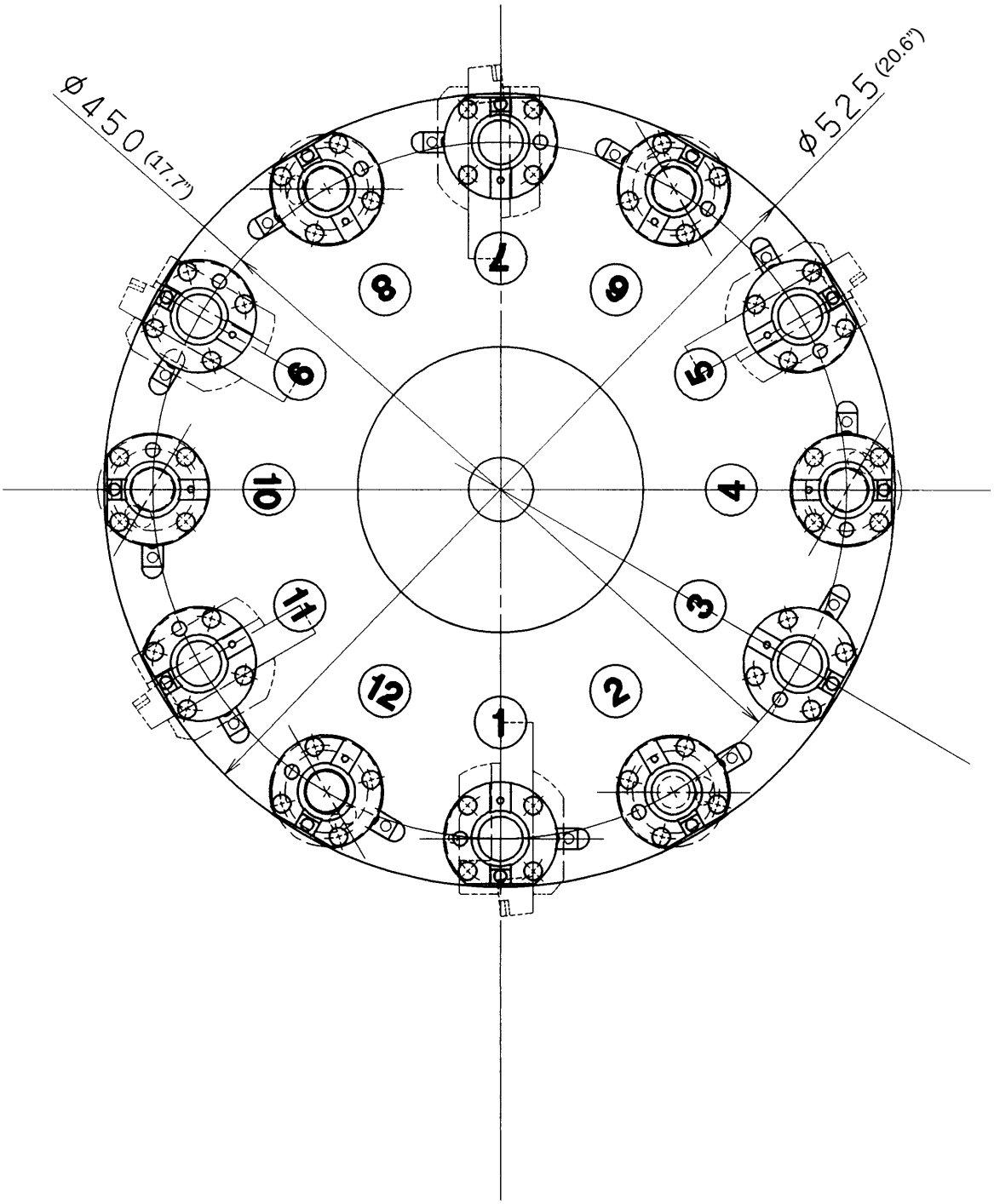
inch (”)



6) 12-station QCT(KV) tool turret head

Dimension: metric (mm)

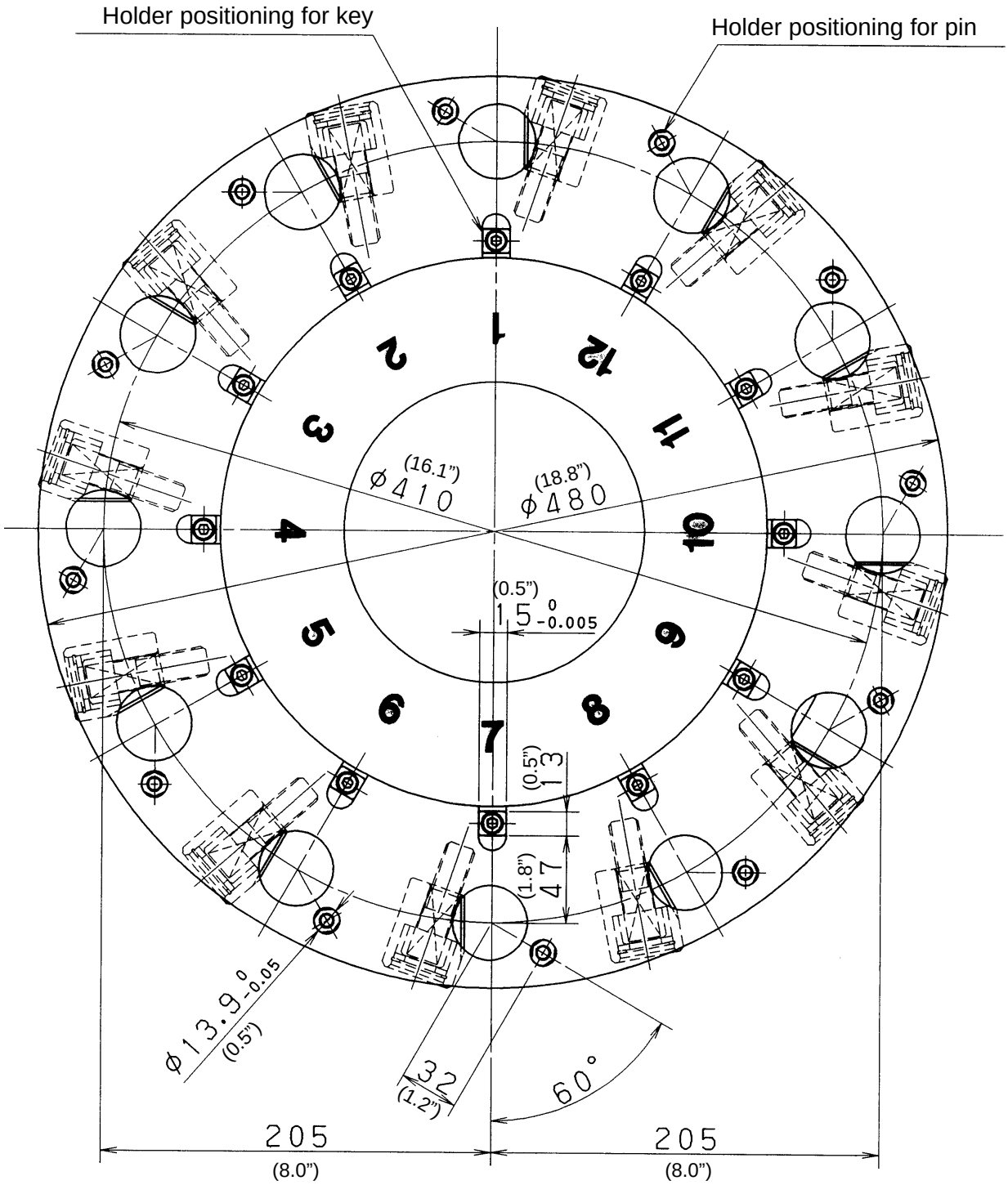
inch (”)



7) 12-station VDI tool turret / 12-station VDI rotating tool turret

Dimension: metric (mm)

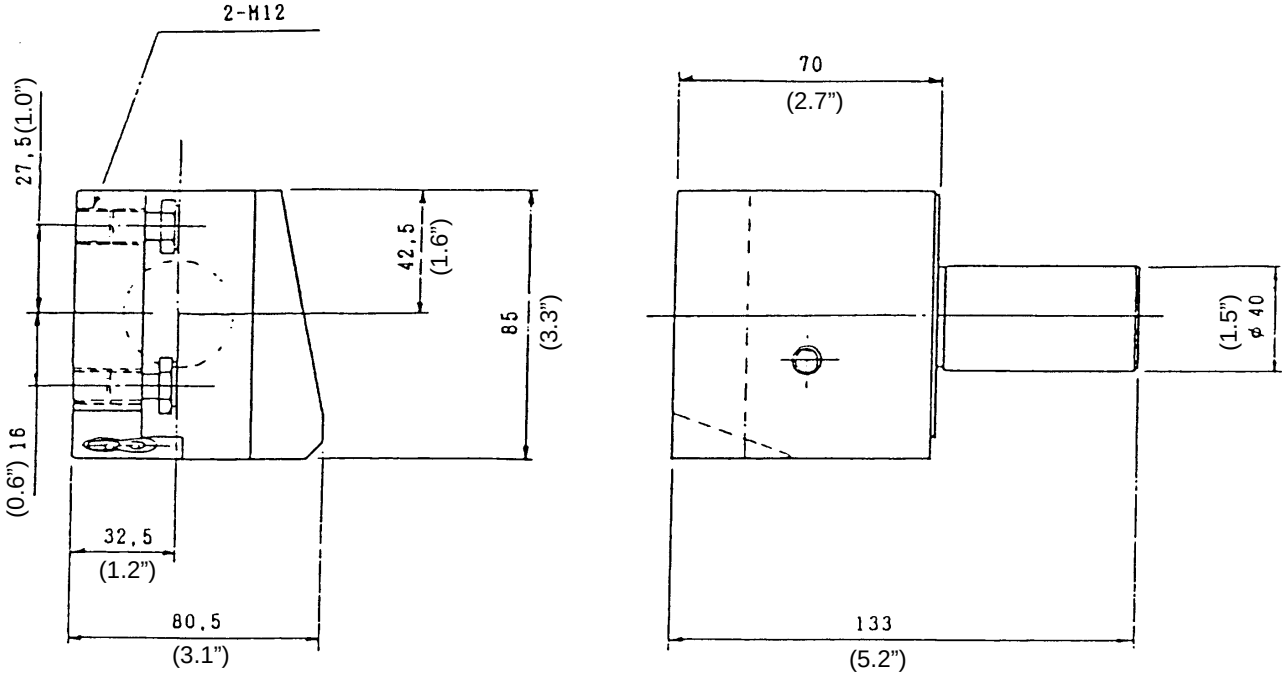
inch (”)

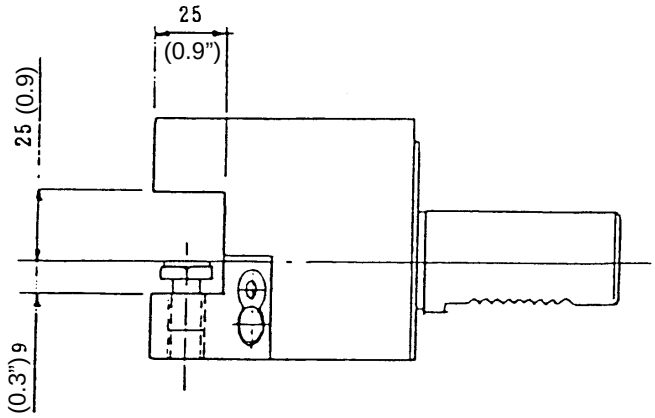


Base holder for OD cutting

Dimension: metric (mm)

inch (")

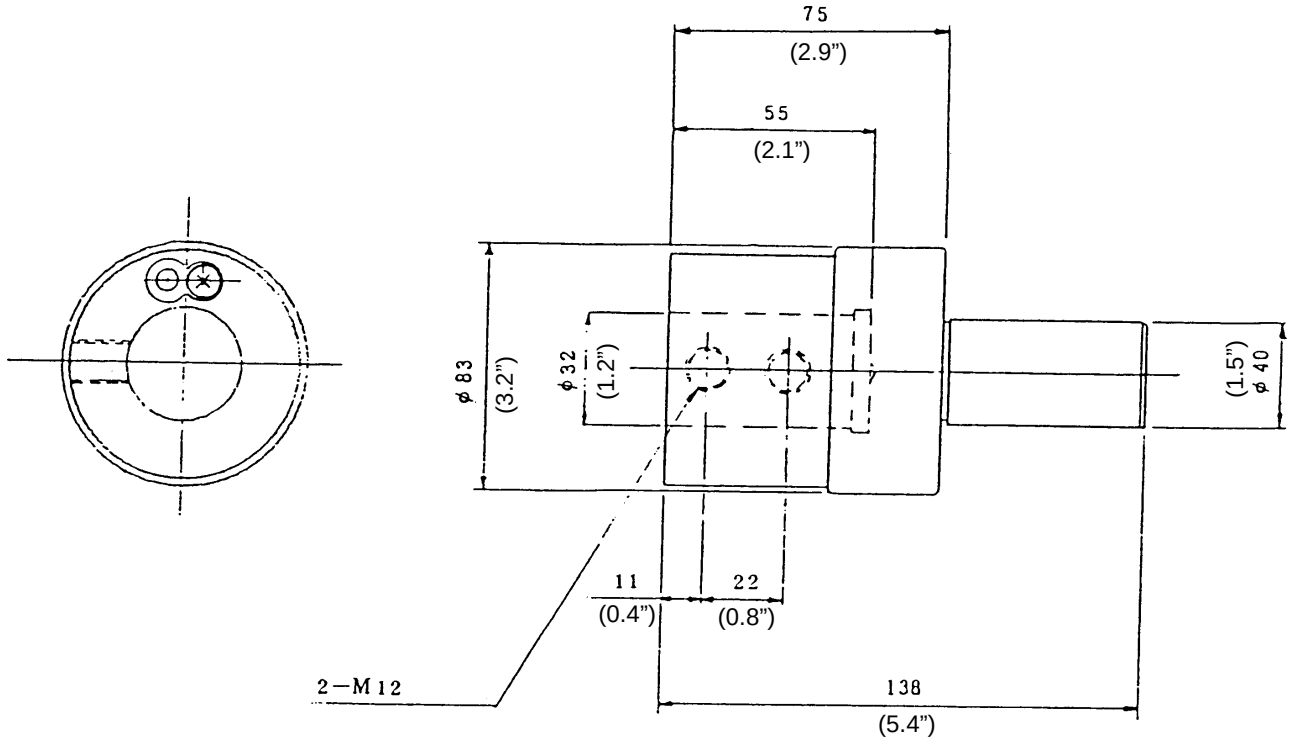


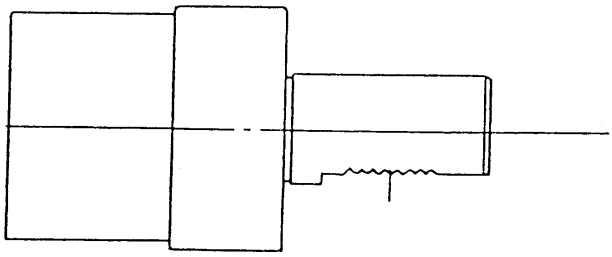


Base holder for boring

Dimension: metric (mm)

inch (”)

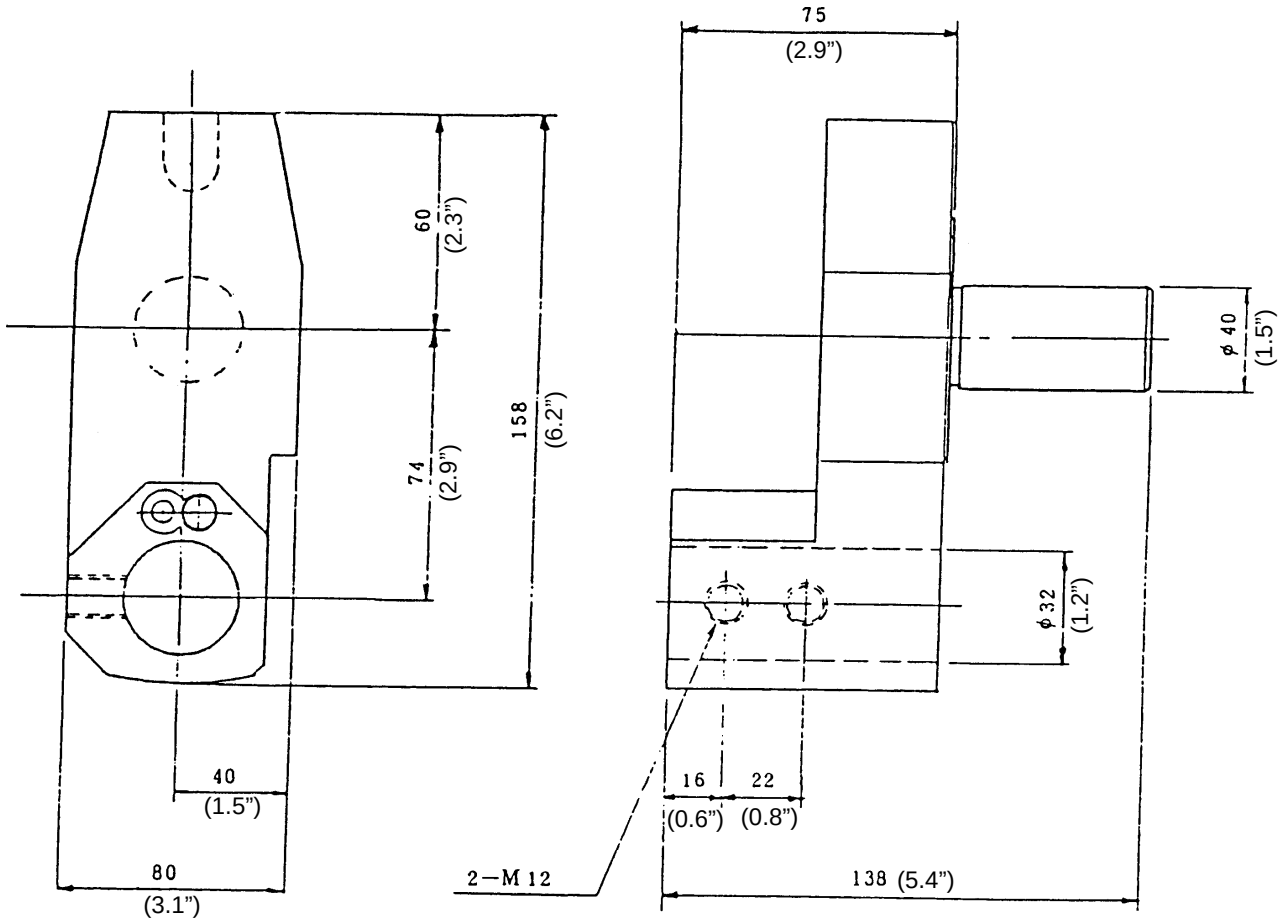


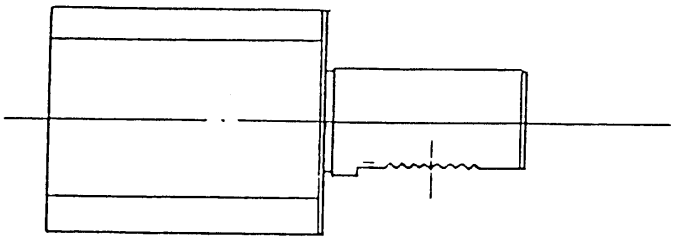


offset Base holder for boring

Dimension: metric (mm)

inch (")

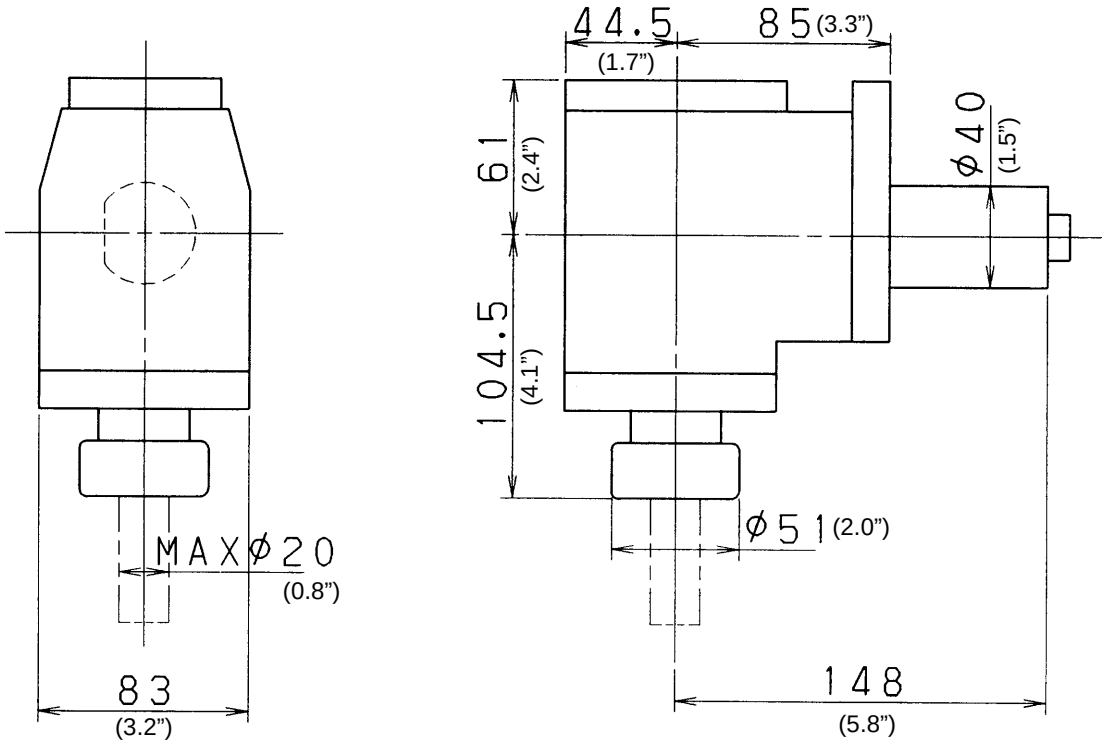




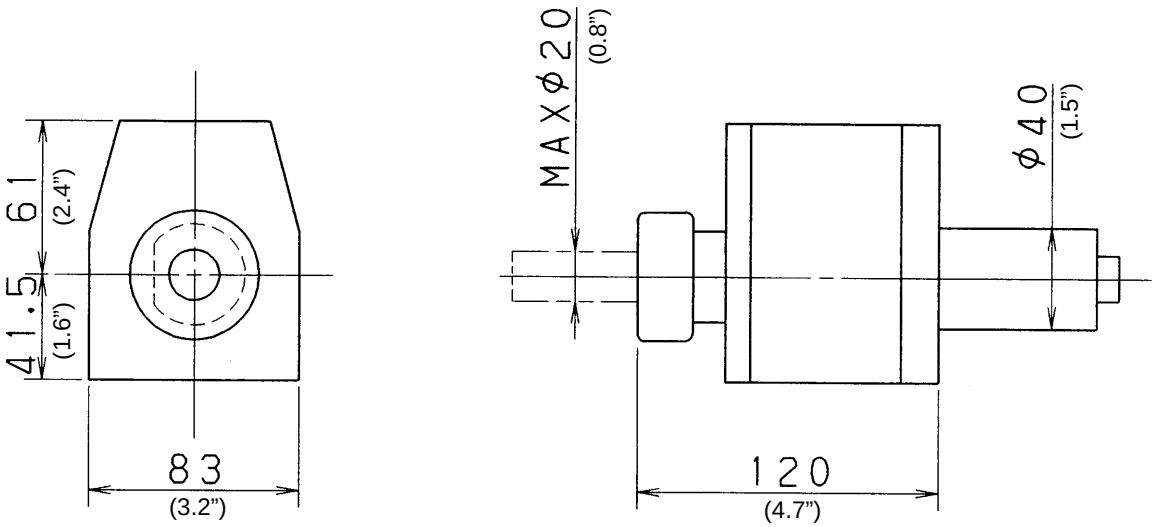
X-axis rotating tool base holder

Dimension: metric (mm)

inch (”)



Z-axis rotating tool base holder

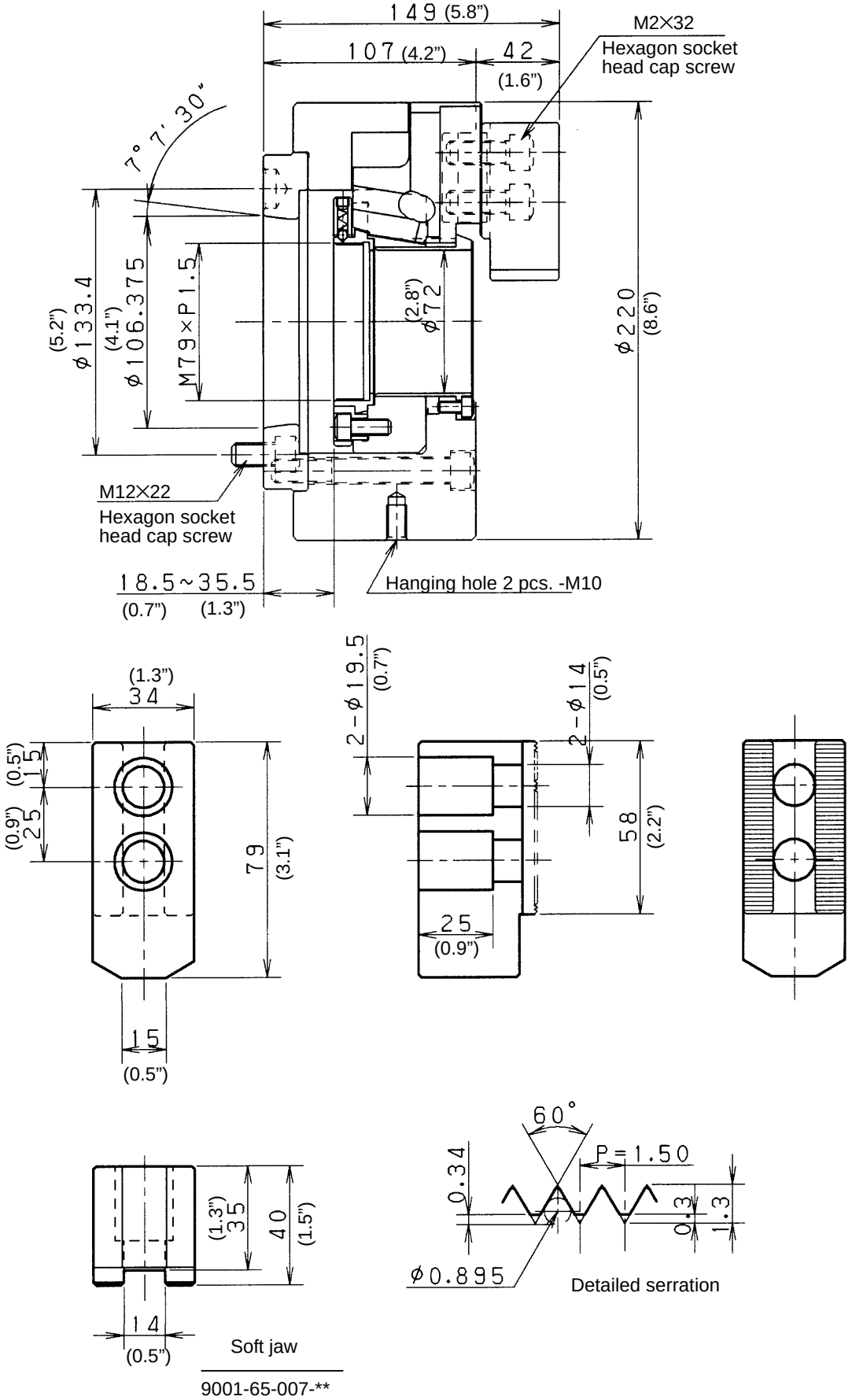


8) Chuck

HT/ST200 ϕ220chuck

Dimension: metric (mm)

inch (”)



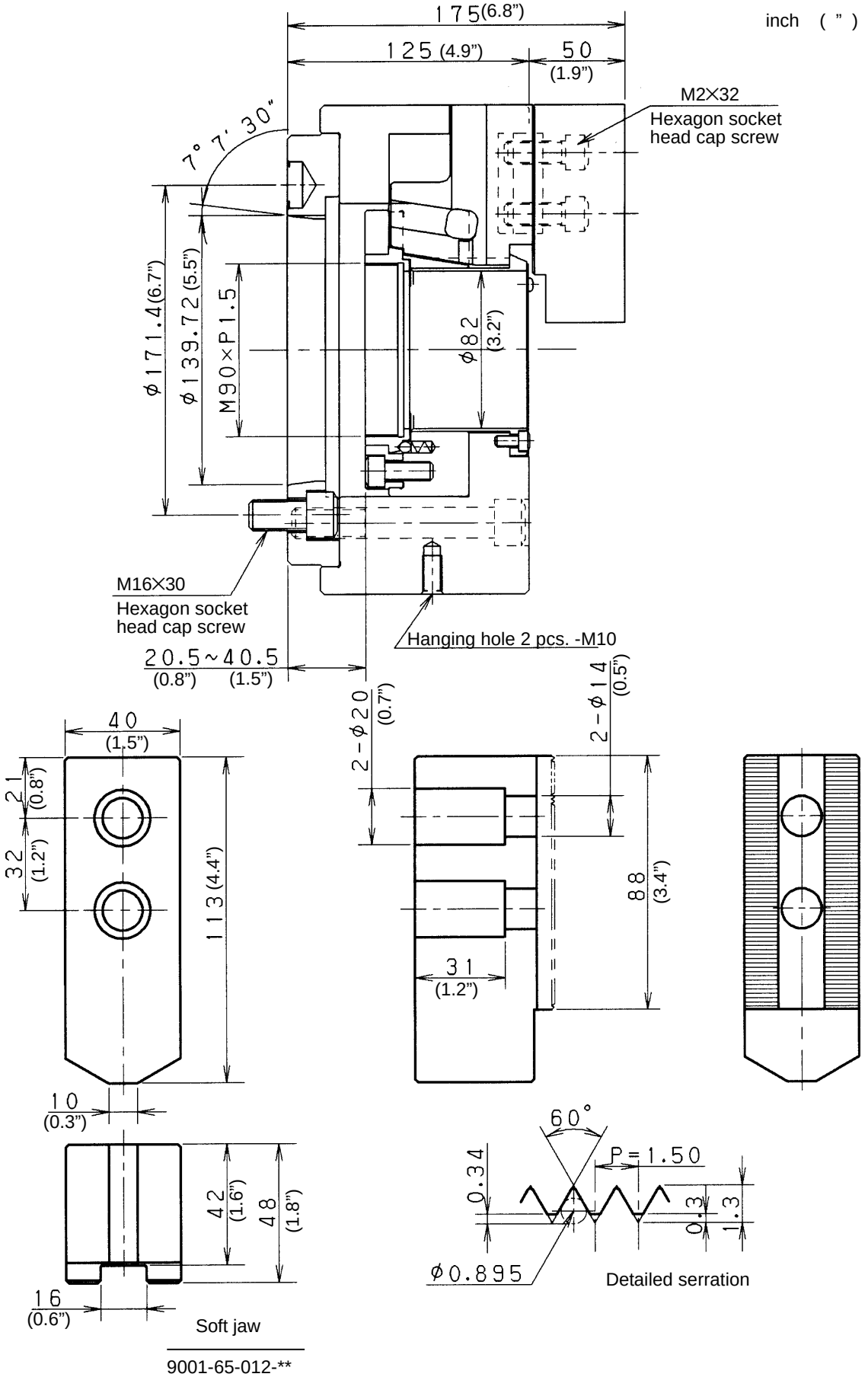
Soft jaw

9001-65-007-**

HT/ST250 ϕ254 chuck

Dimension: metric (mm)

inch (”)

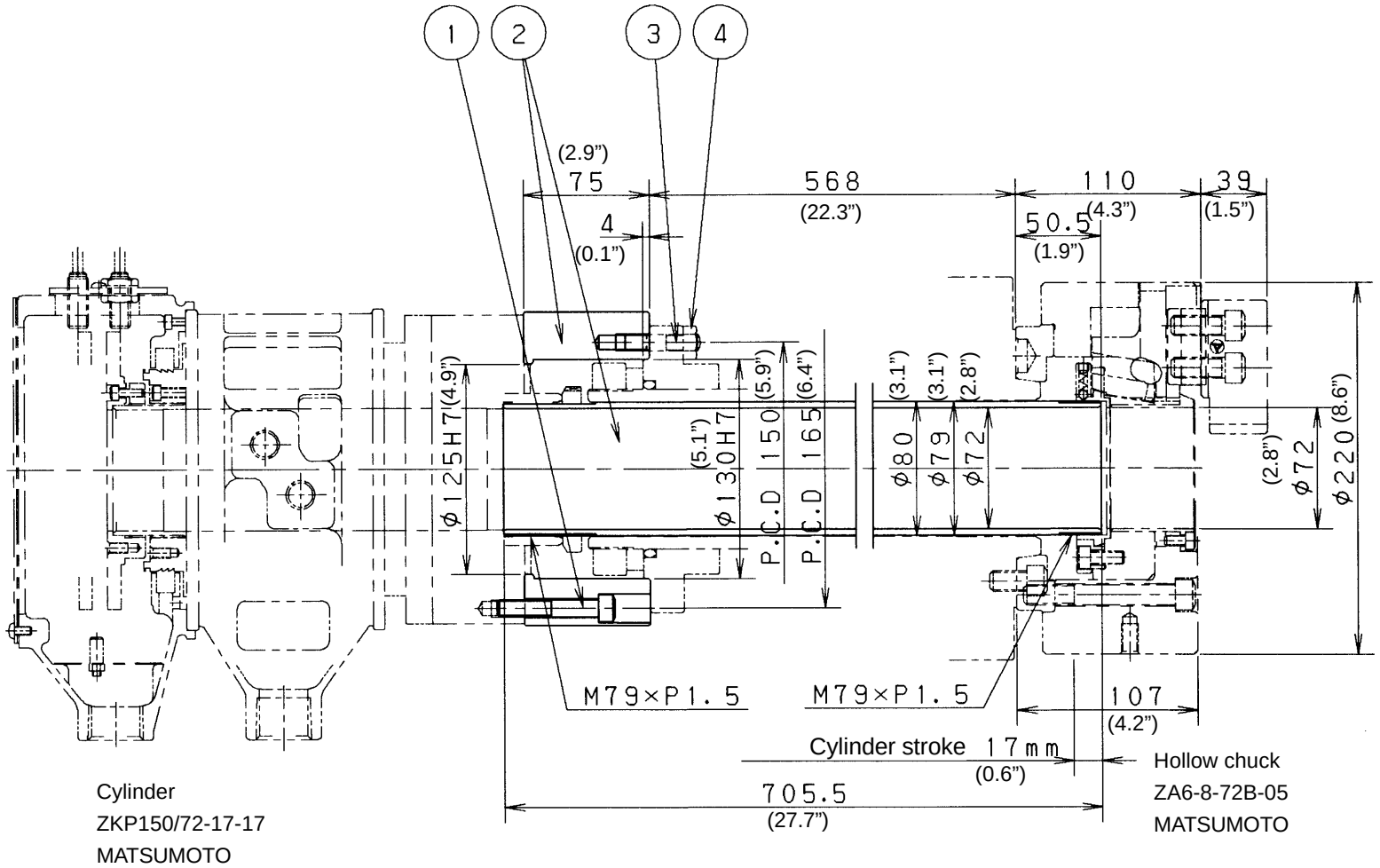


9001-65-012-**

9) Hollow chuck cylinder

Connecting part for φ220 hollow chuck cylinder

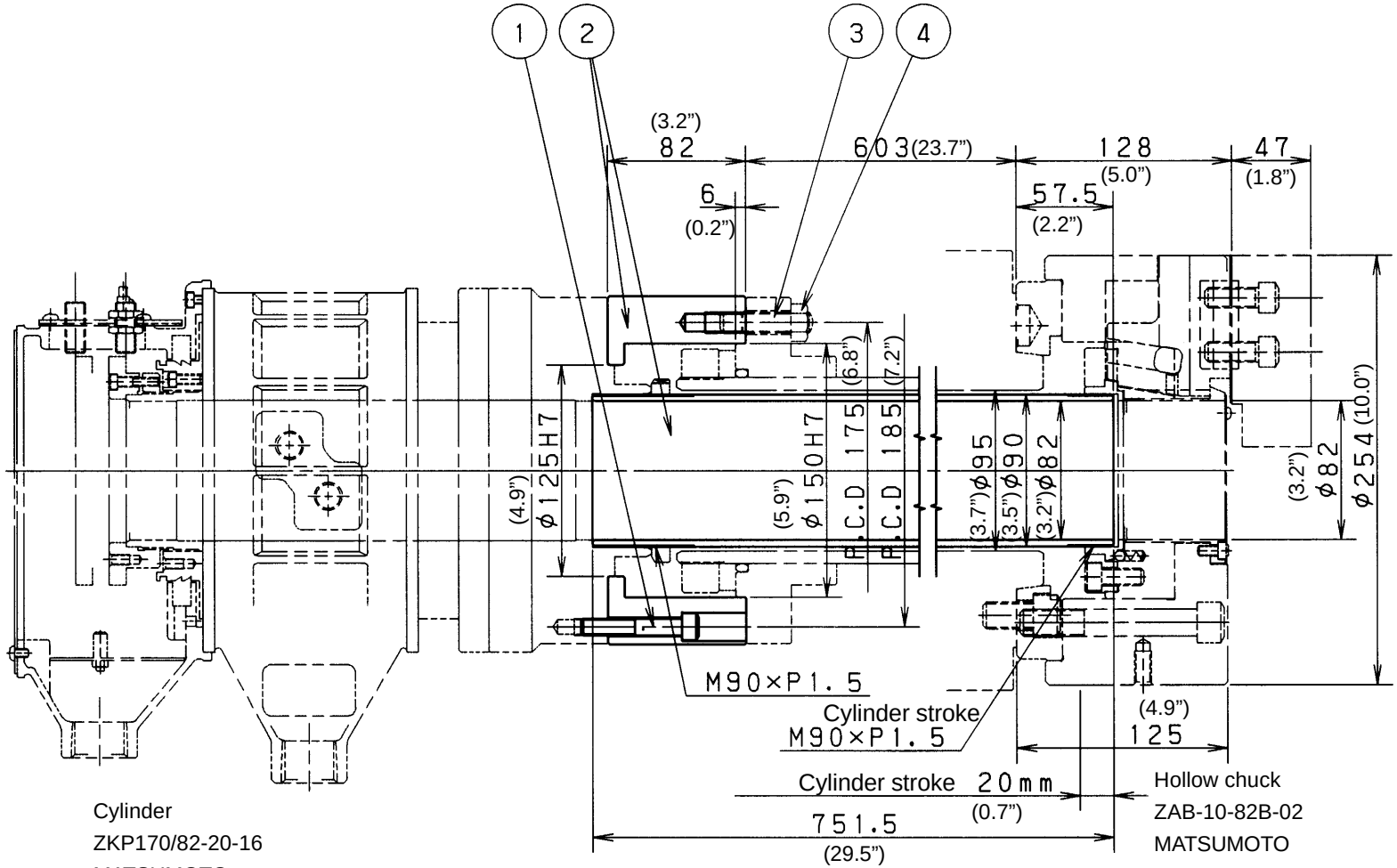
Dimension: metric (mm)
inch (”)



No.	Name	Drawing No. or type	Q’ty
1	Bolt with hexagonal hole	4B1060	4
2	Tube and adapter	1782-00-816-**	1
3	Bolt with	6B1030	4
4	Nut	1N10	4

Connecting part for φ254 hollow chuck cylinder

Dimension: metric (mm)
inch (")



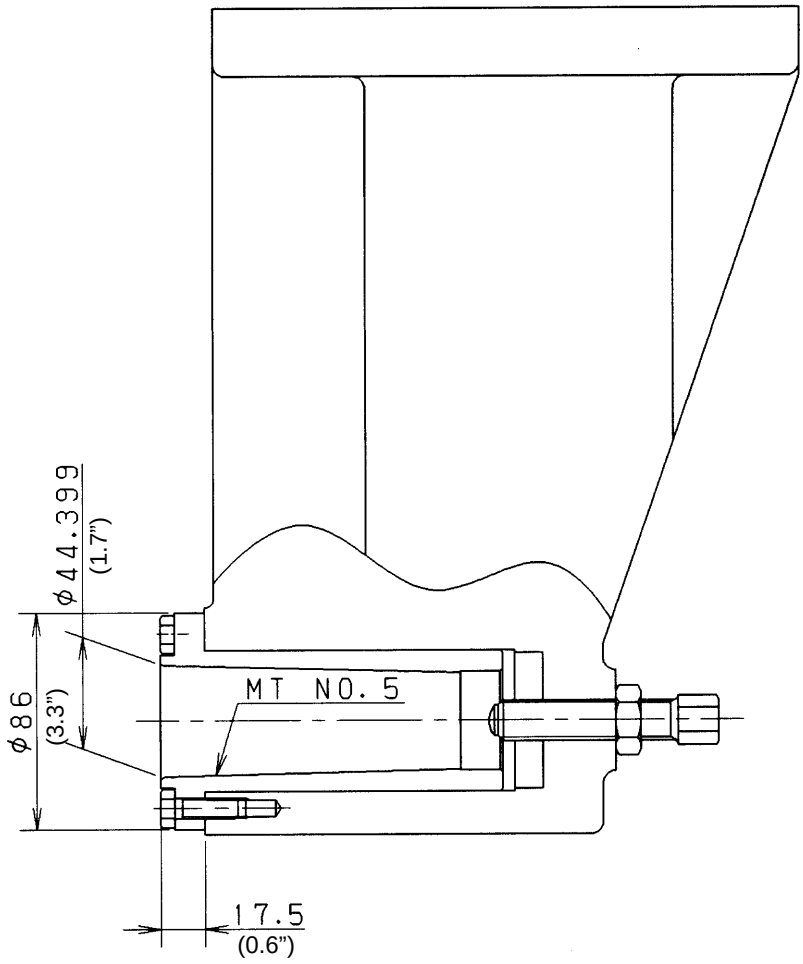
No.	Name	Drawing No. or type	Q'ty
1	Bolt with hexagonal hole	4B1060	4
2	Tube and adapter	1782-00-819-**	1
3	Bolt with	6B1240	4
4	Nut	1N12	4

10) Center

Dimension: metric (mm)

inch (”)

Tailstock Center



3. REQUIRED DIMENSION FOR MACHINE

Dimension : metric (mm)
inch (”)

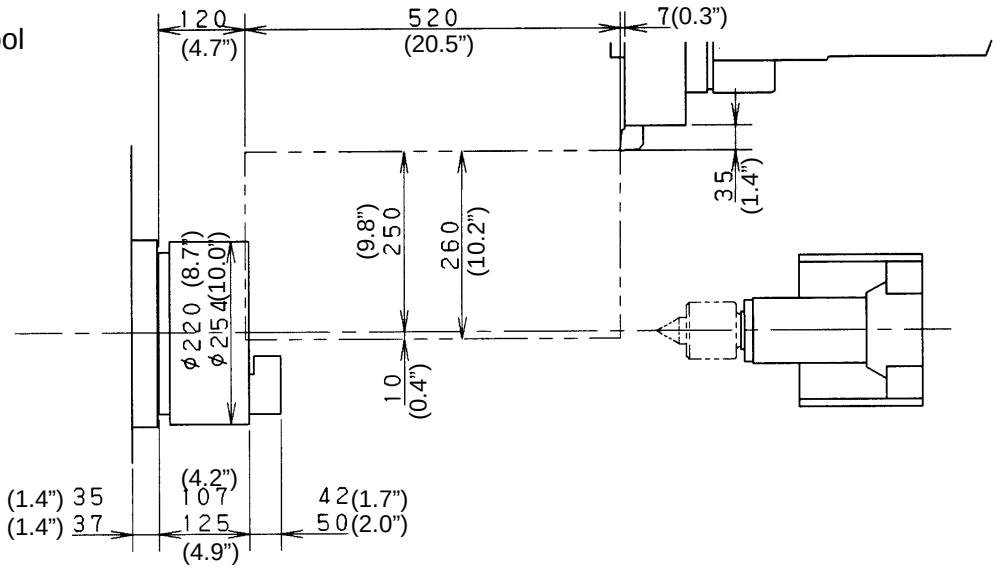
3-1 Tool Traveling Range

1) **HT200/250, ST200/250**

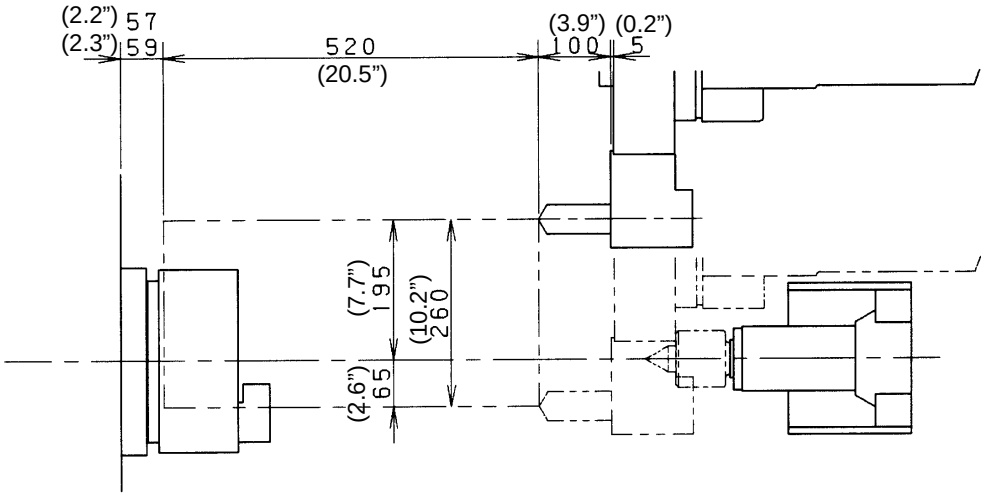
12-station Base Holder Turret Head

Upper : HT/ST200
Lower : HT/ST250

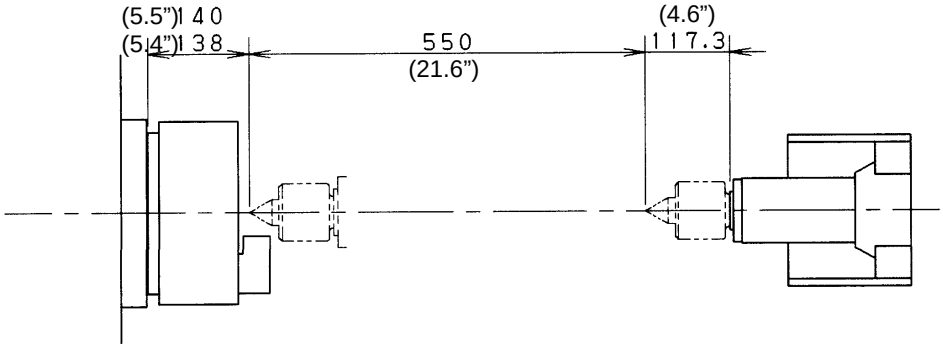
O.D turning tool



I.D turning tool



Tailstock

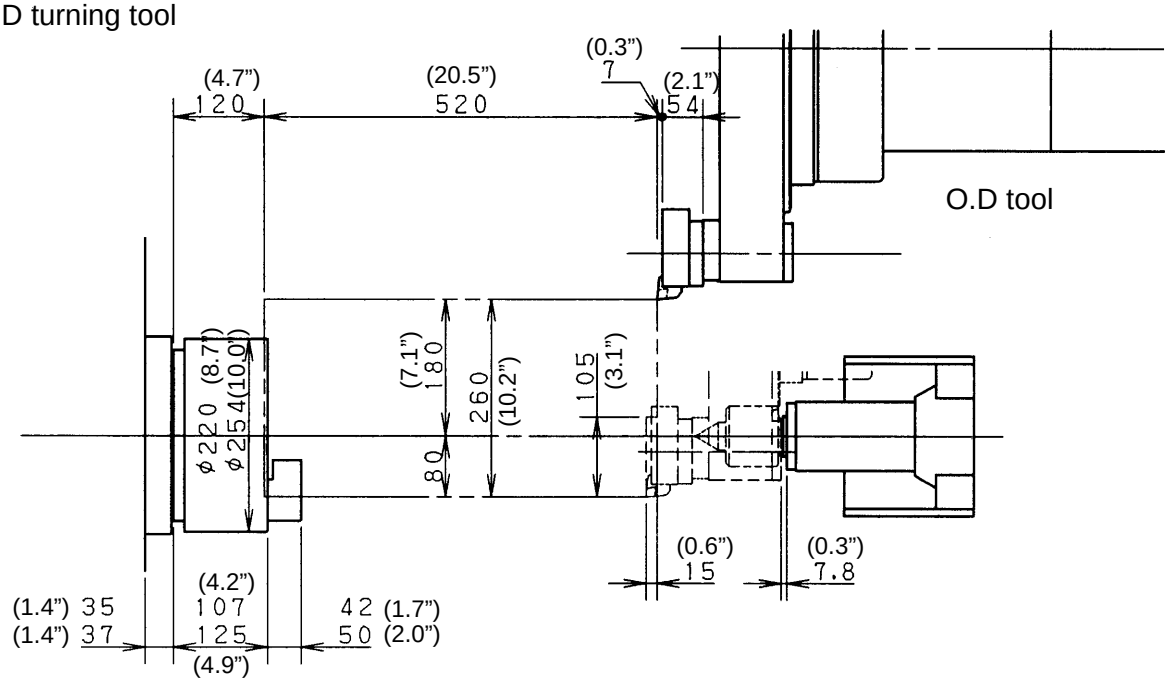


2) **12-station QCT(KV) Tool Turret Head**

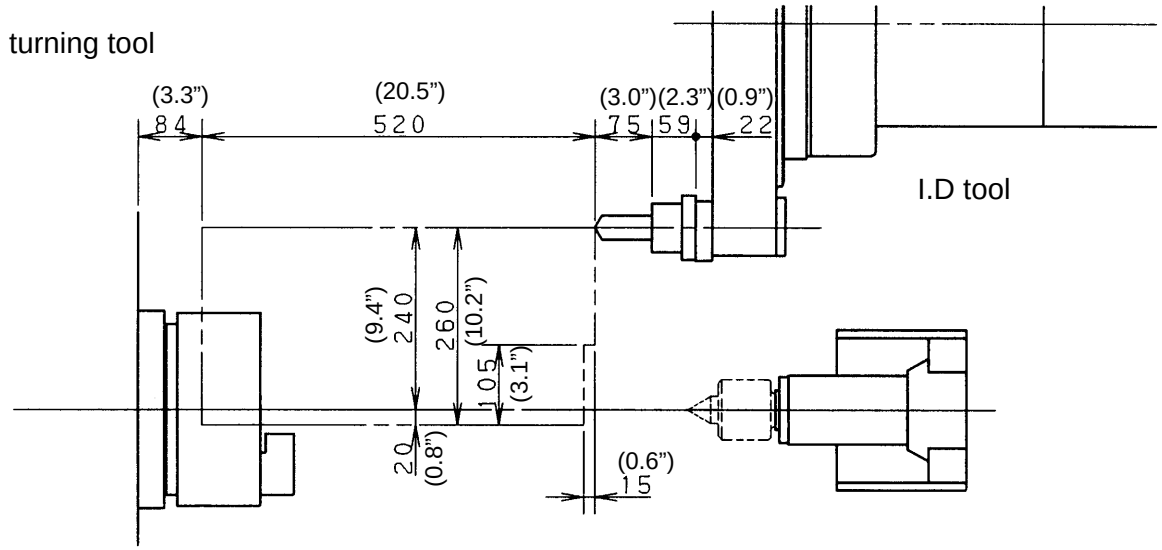
Dimension : metric (mm)
inch (”)

Upper : HT/ST200
Lower : HT/ST250

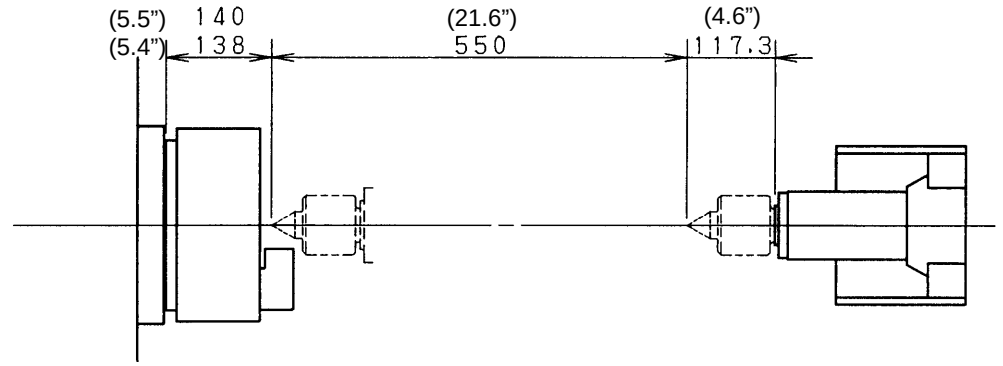
O.D turning tool



I.D turning tool



Tailstock

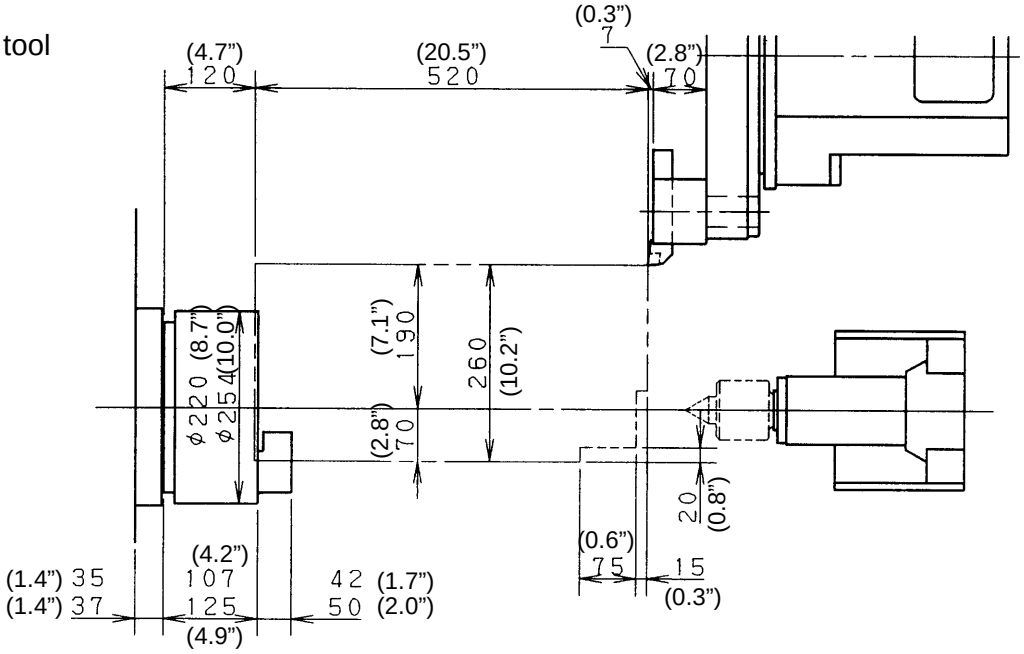


3) **12-station VDI Turret Head**

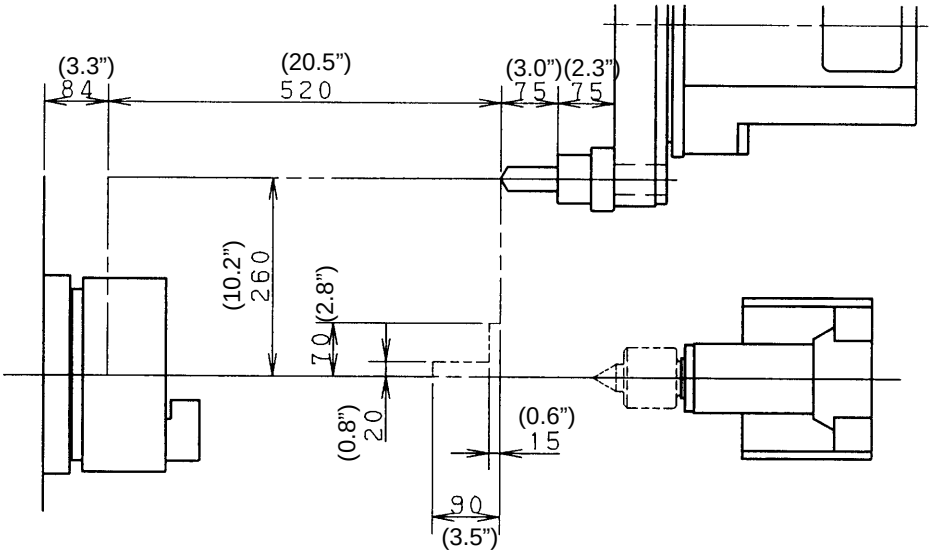
Dimension : metric (mm)
inch (”)

Upper : HT/ST200
Lower : HT/ST250

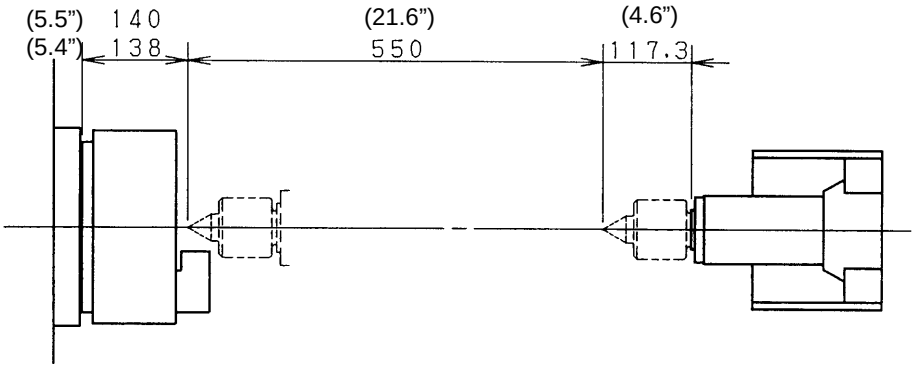
O.D turning tool



I.D turning tool



Tailstock

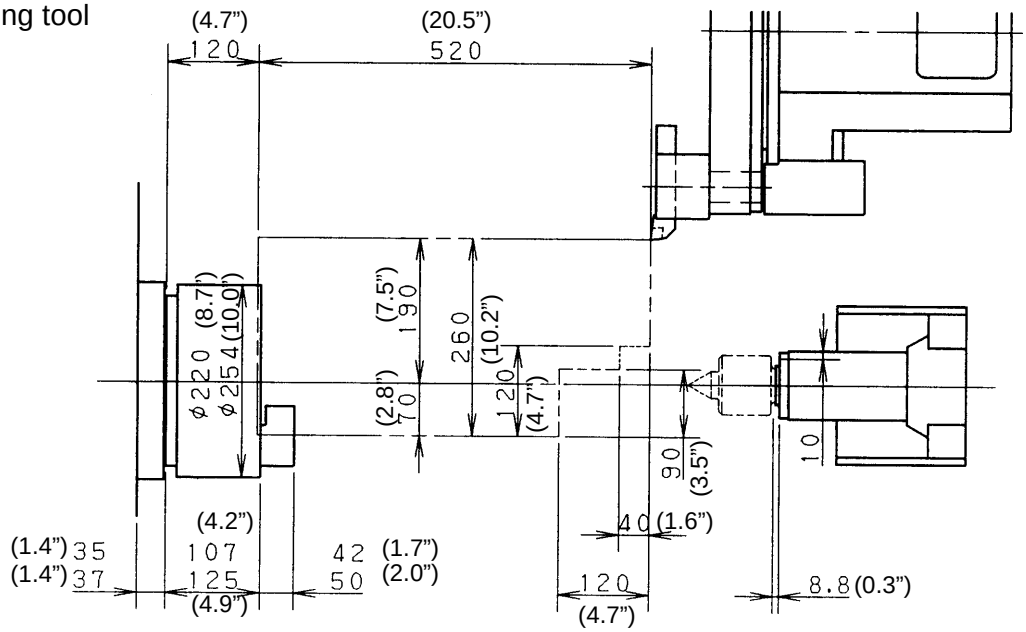


4) **12-station VDI Rotating Tool Turret Head**

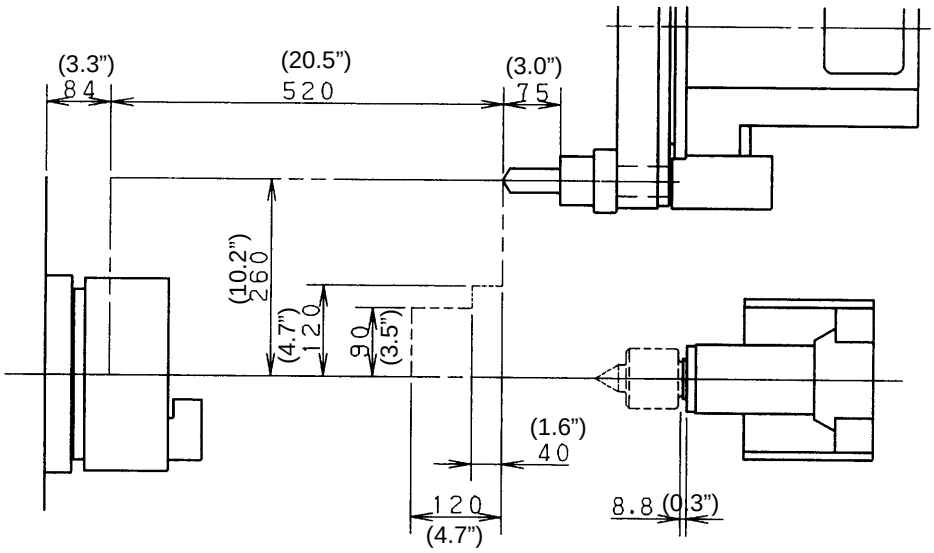
Dimension : metric (mm)
inch (”)

Upper : HT/ST200
Lower : HT/ST250

O.D turning tool



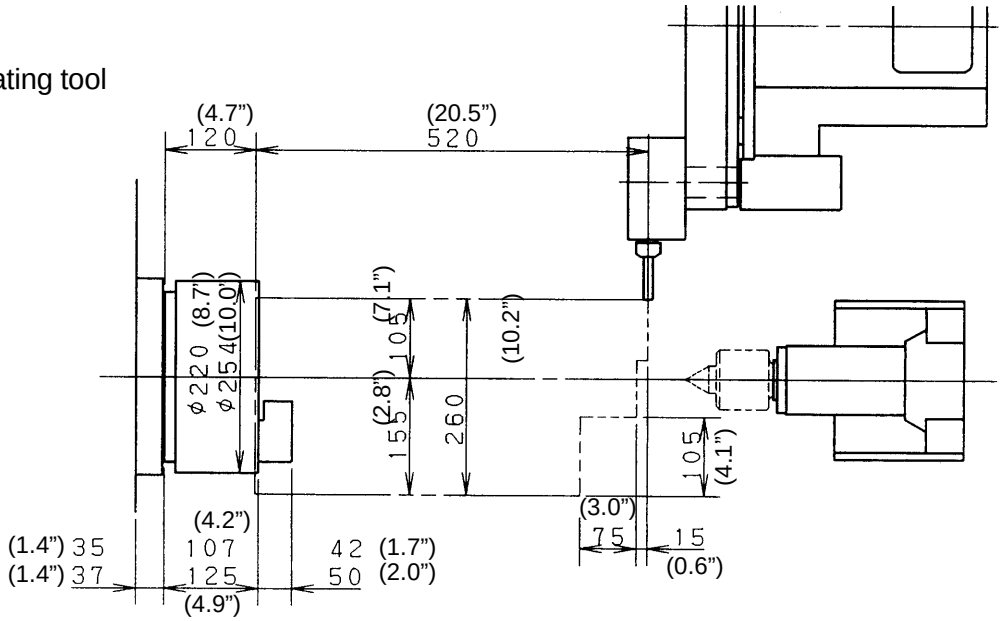
I.D turning tool



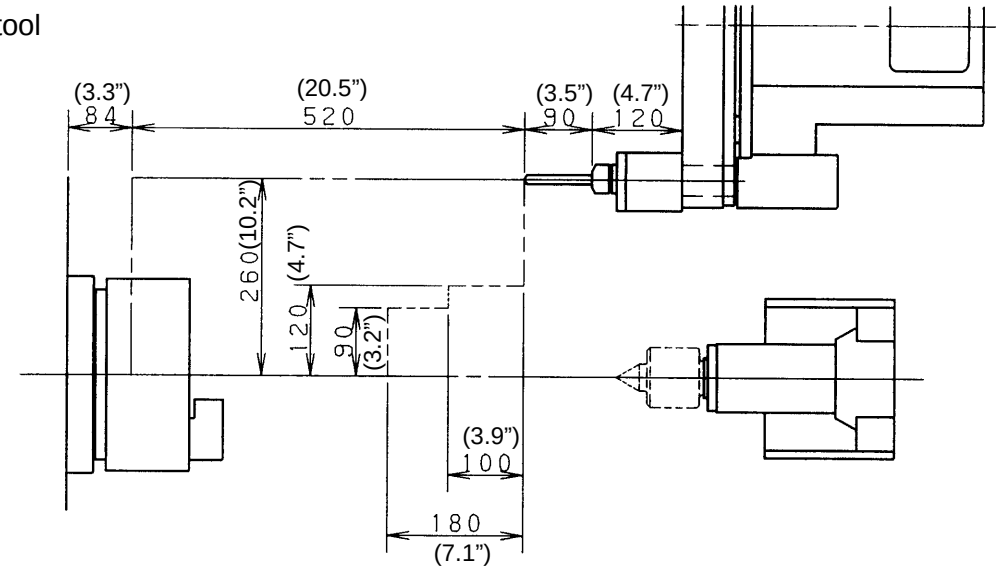
Dimension : metric (mm)
inch (”)

Upper : HT/ST200
Lower : HT/ST250

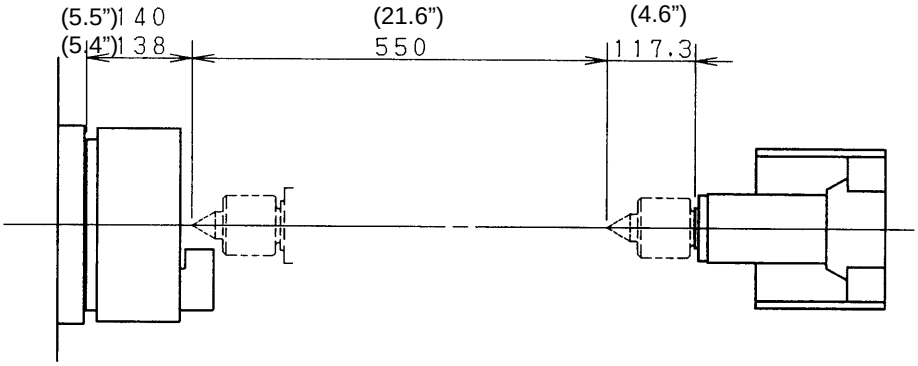
X axis rotating tool



Z axis rotating tool



Tailstock

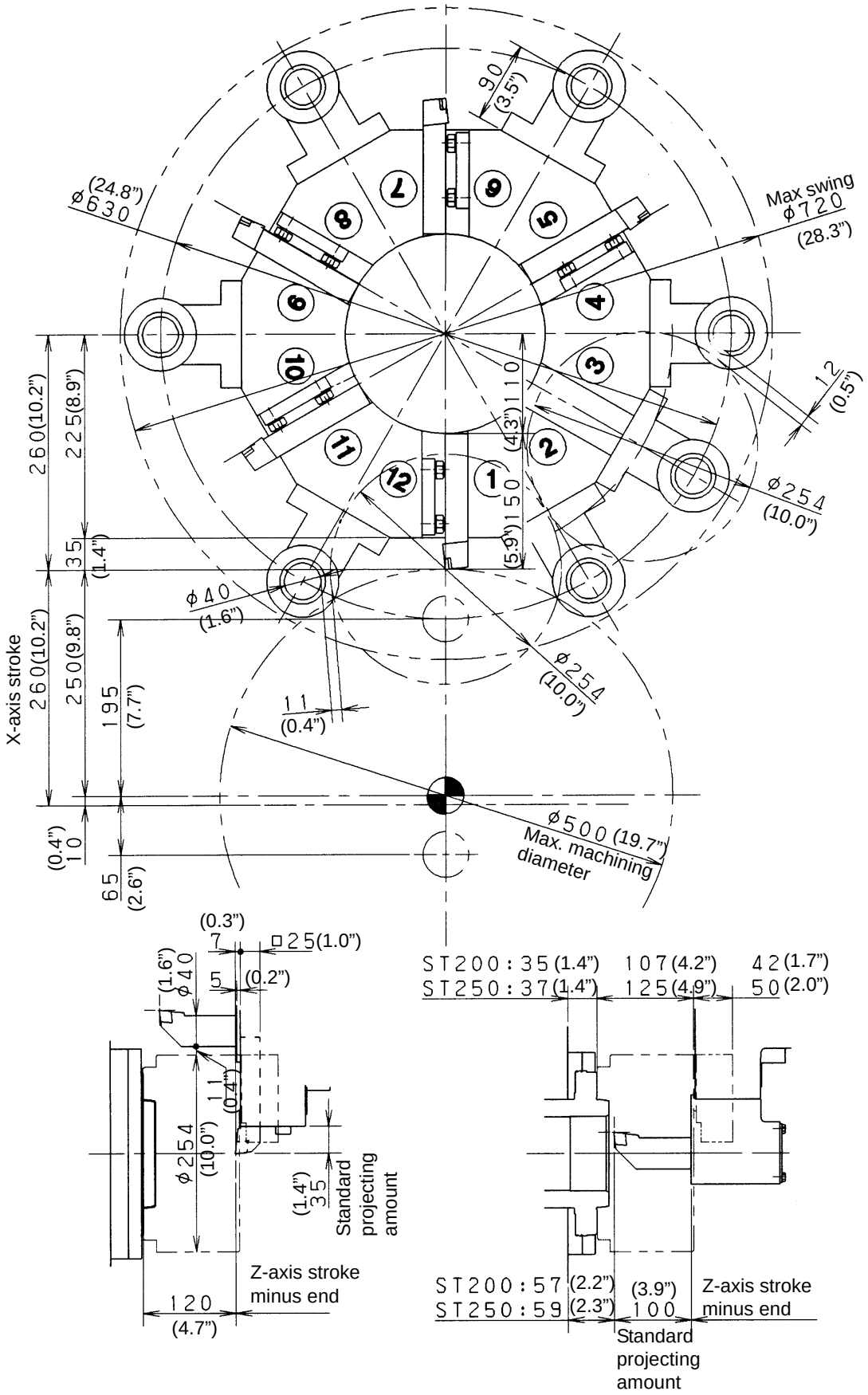


3-2 Tool Interaction Drawing

1) **12-station Base Holder Turret Head**

Dimension : metric (mm)
inch (”)

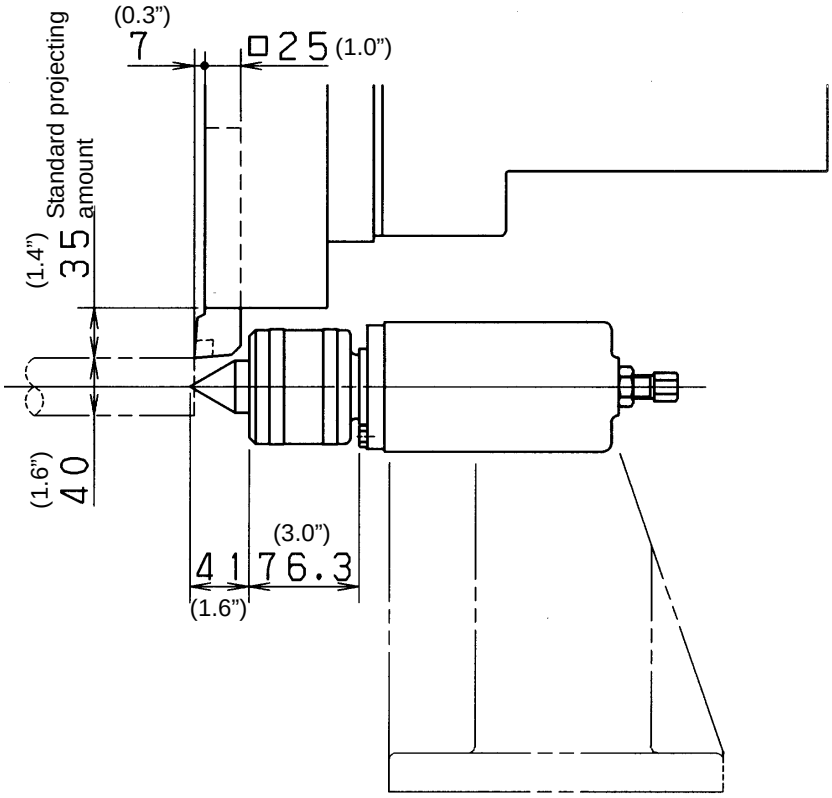
a) Limit of the machining area by the turret



b) Limit of the machining area when Hitachi Seiki revolving center is used.

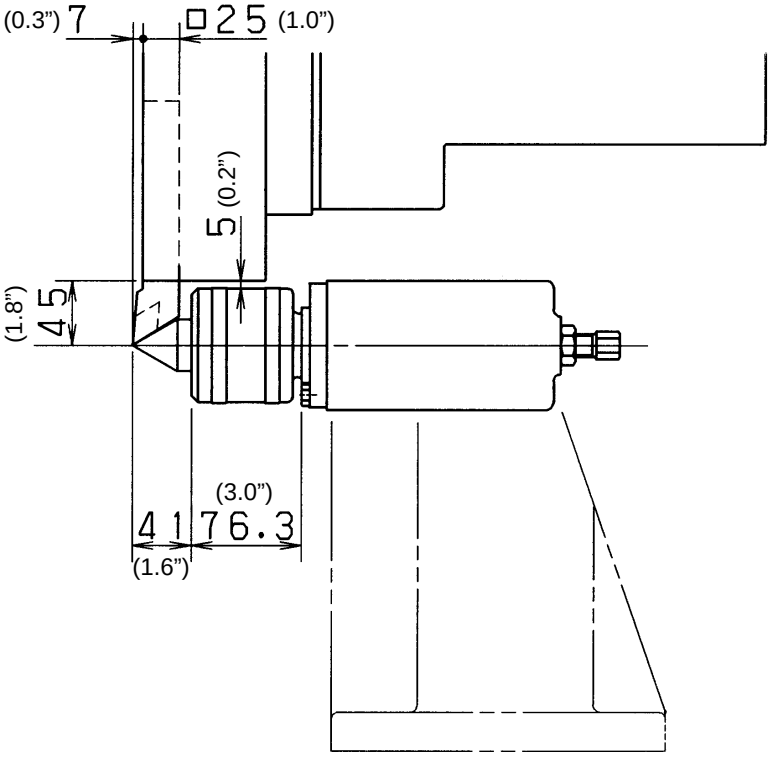
Outer diameter roughing tool

Dimension : metric (mm)
inch (”)



Outer diameter profiling tool

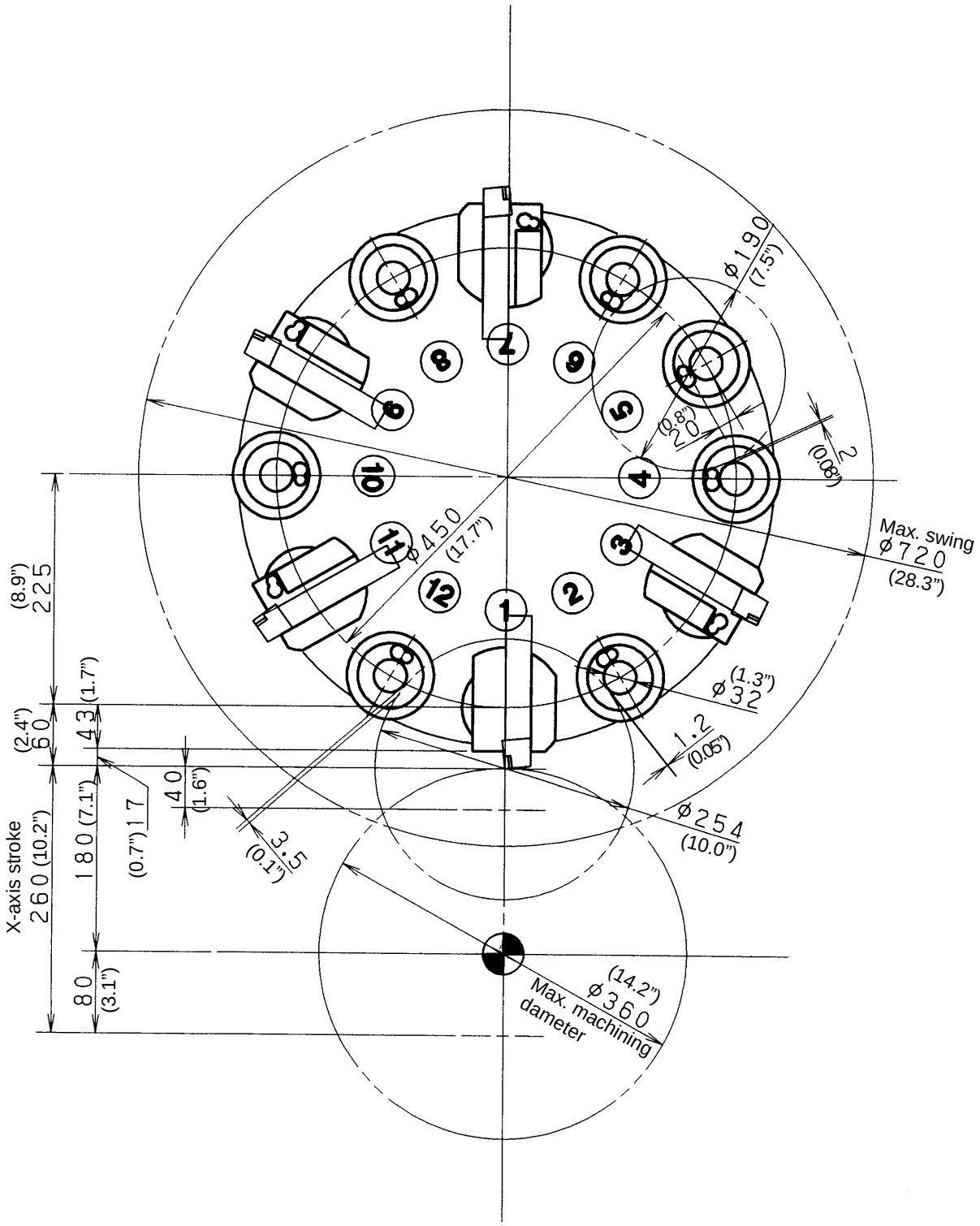
(The tool is 10mm (0.4”) projection than the standard)



2) 12-station QCT(KV) Turret Head

a) Limit of the machining area by turret

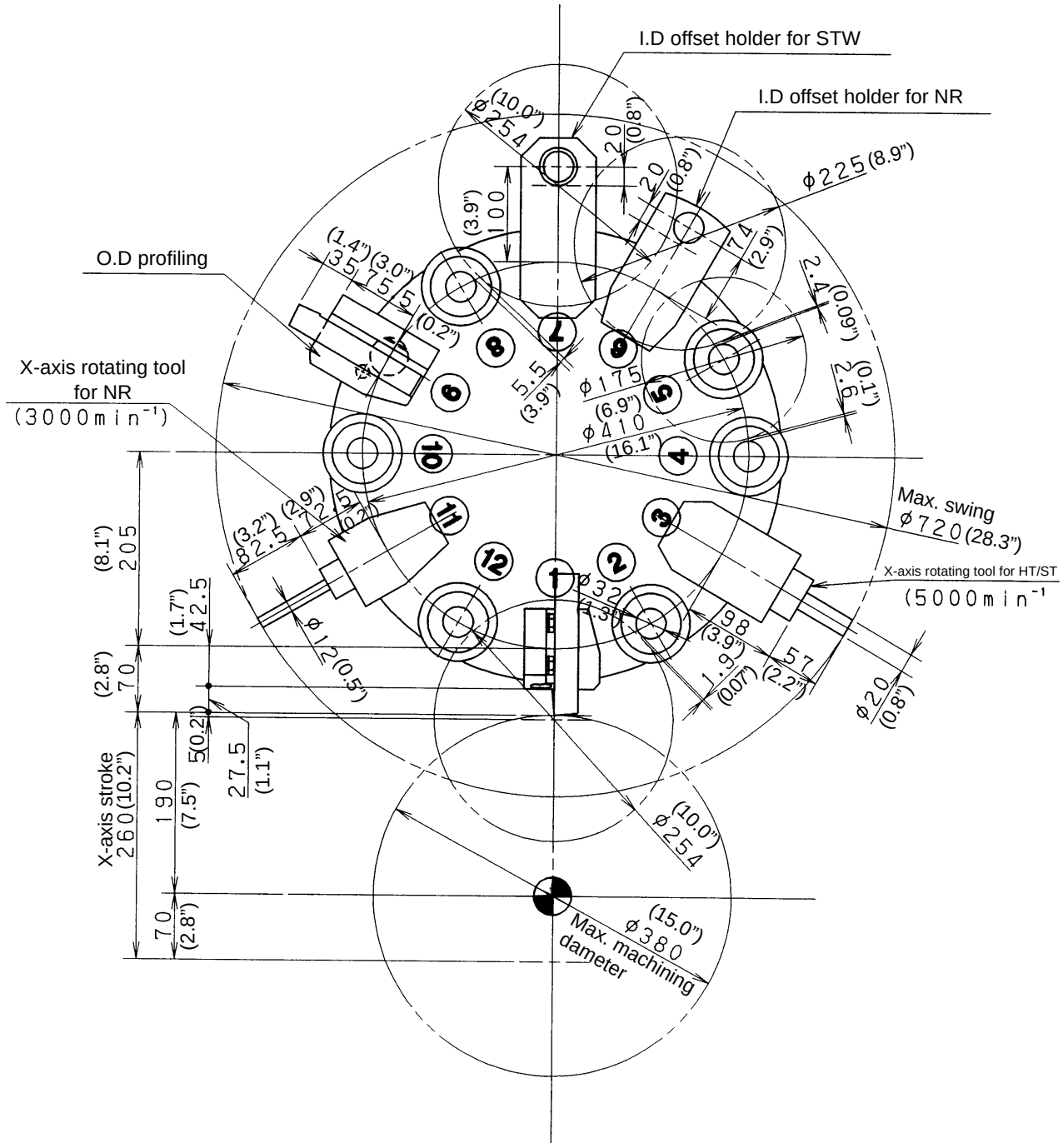
Dimension : metric (mm)
inch (”)



3) 12-station VDI Turret Head / VDI Rotating Tool Turret Head

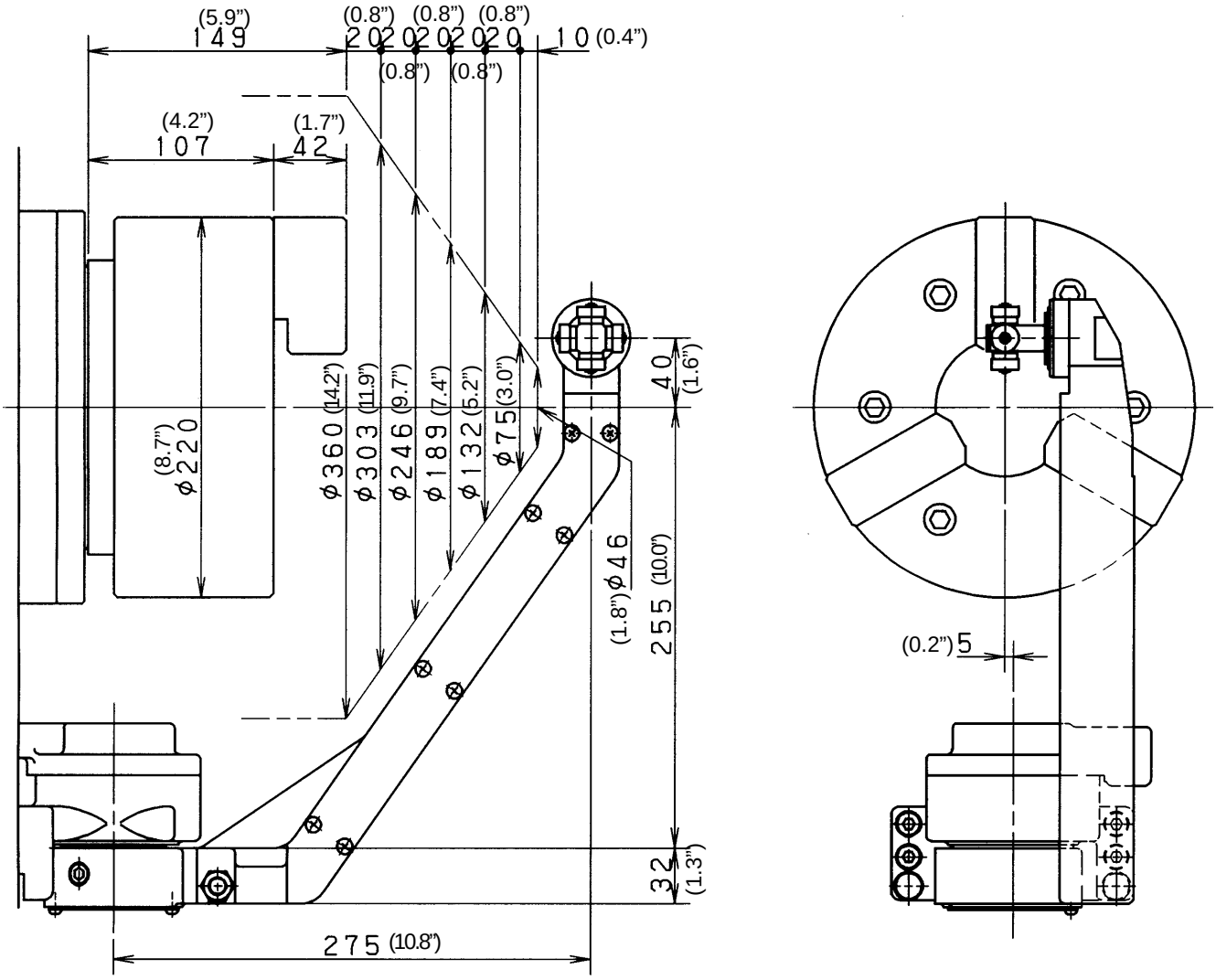
a) Limit of the machining area by turret

Dimension : metric (mm)
inch (”)

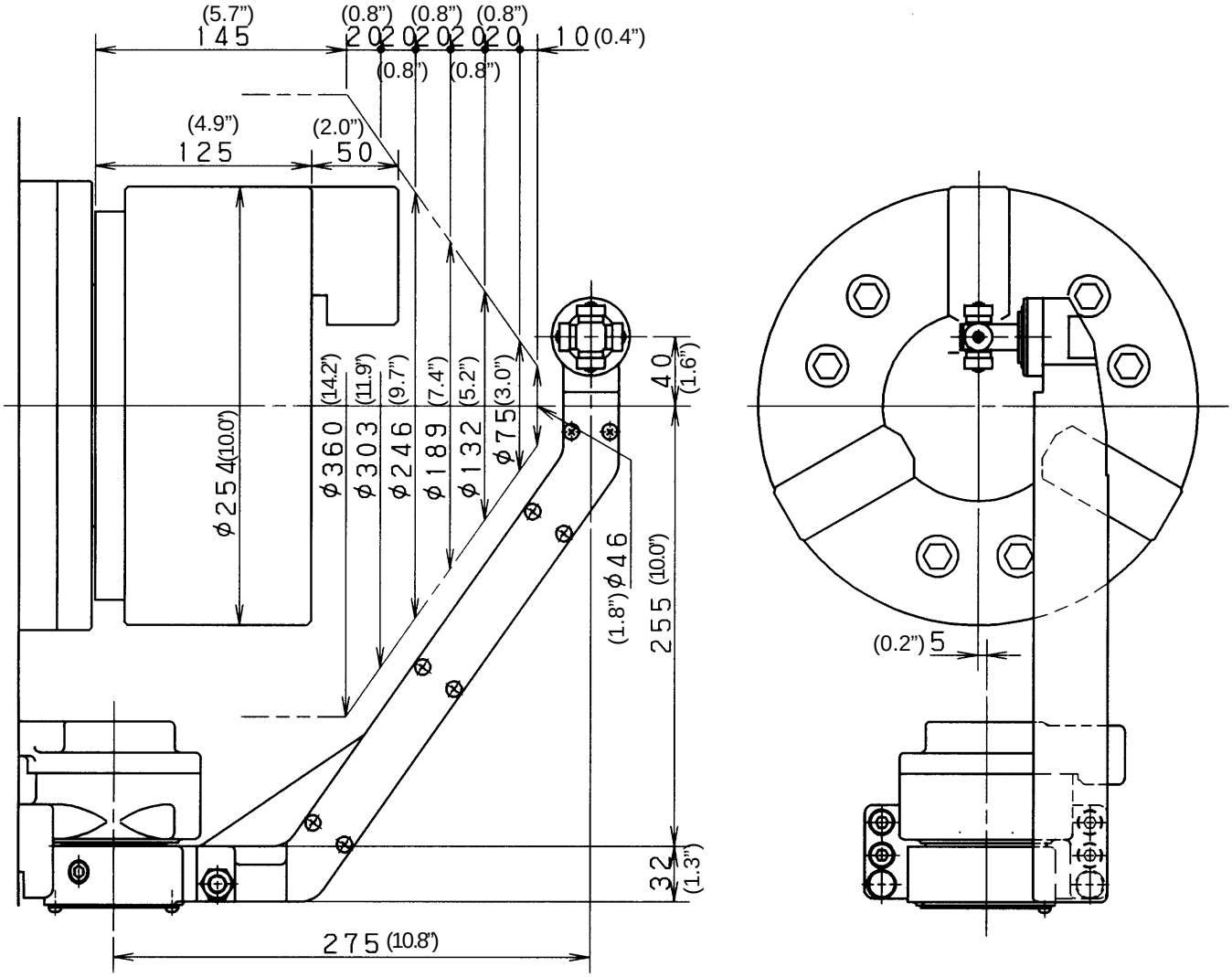


3-3 Quick Setter and Workpiece Interference Drawing

ϕ220 chuck



ϕ254 chuck


(5.7")
145
(0.8")
(0.8")
(0.8")
20 20 20 20
10 (0.4")
(0.8")
(0.8")
(4.9")
125
(2.0")
50
ϕ254 (10.0")
ϕ360 (14.2")
ϕ303 (11.9")
ϕ246 (9.7")
ϕ189 (7.4")
ϕ132 (5.2")
ϕ75 (3.0")
40 (1.6")
(1.8") ϕ46
255 (10.0")
32 (1.3")
275 (10.8")
(0.2") 5

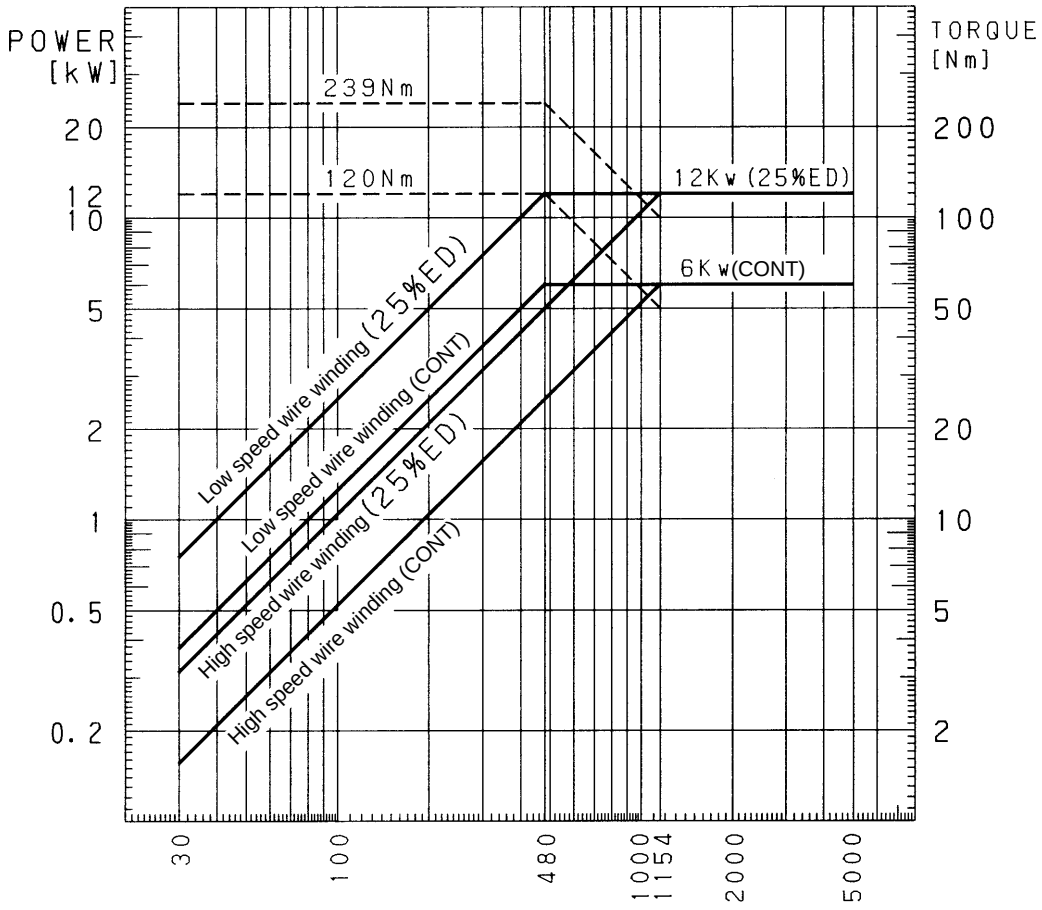
3-4 Spindle Output Diagram

This machine is equipped with a variable AC motor. The output within the constant torque varies with the number of the spindle revolutions at that moment.

When heavy cutting (roughing and so forth) is done within the constant torque area, depending on the spindle revolution speed, it may come to a stop being unable to withstand the cutting force.

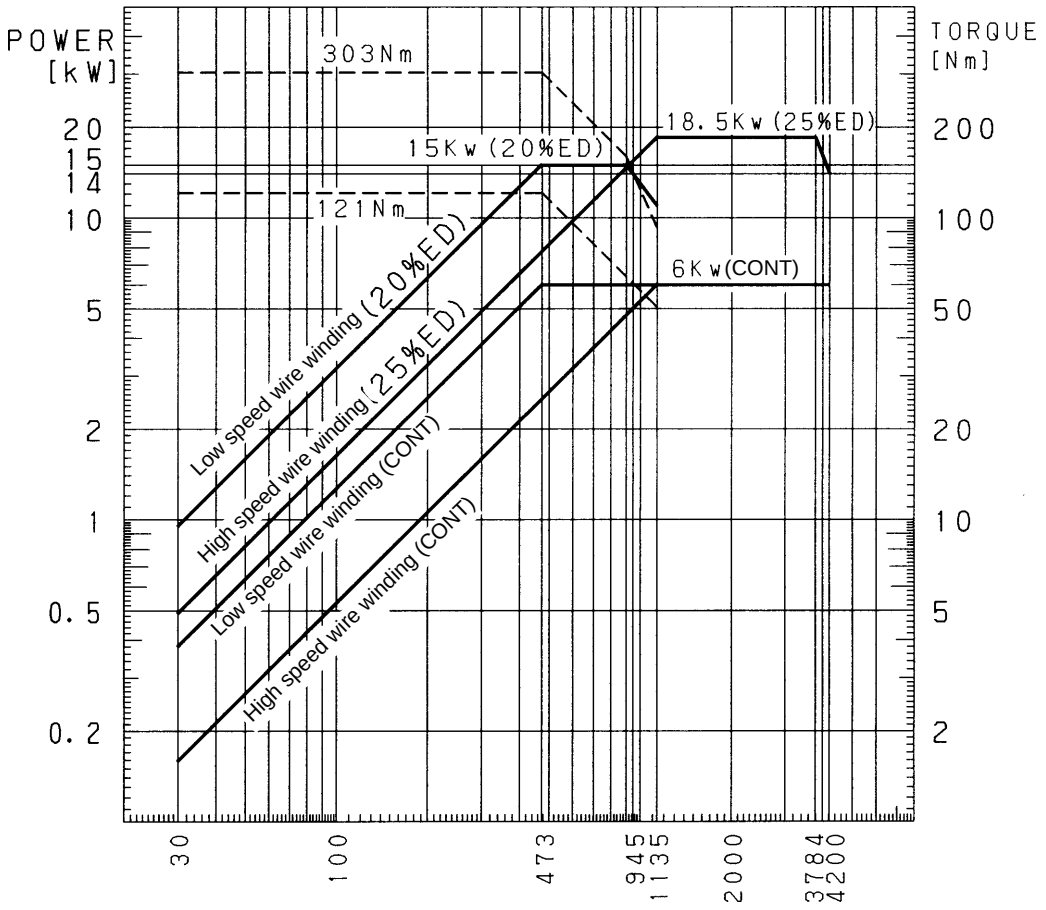
Accordingly, select the revolution speed area in such a way that heavy cutting is done within the output constant area.

HT/ST200



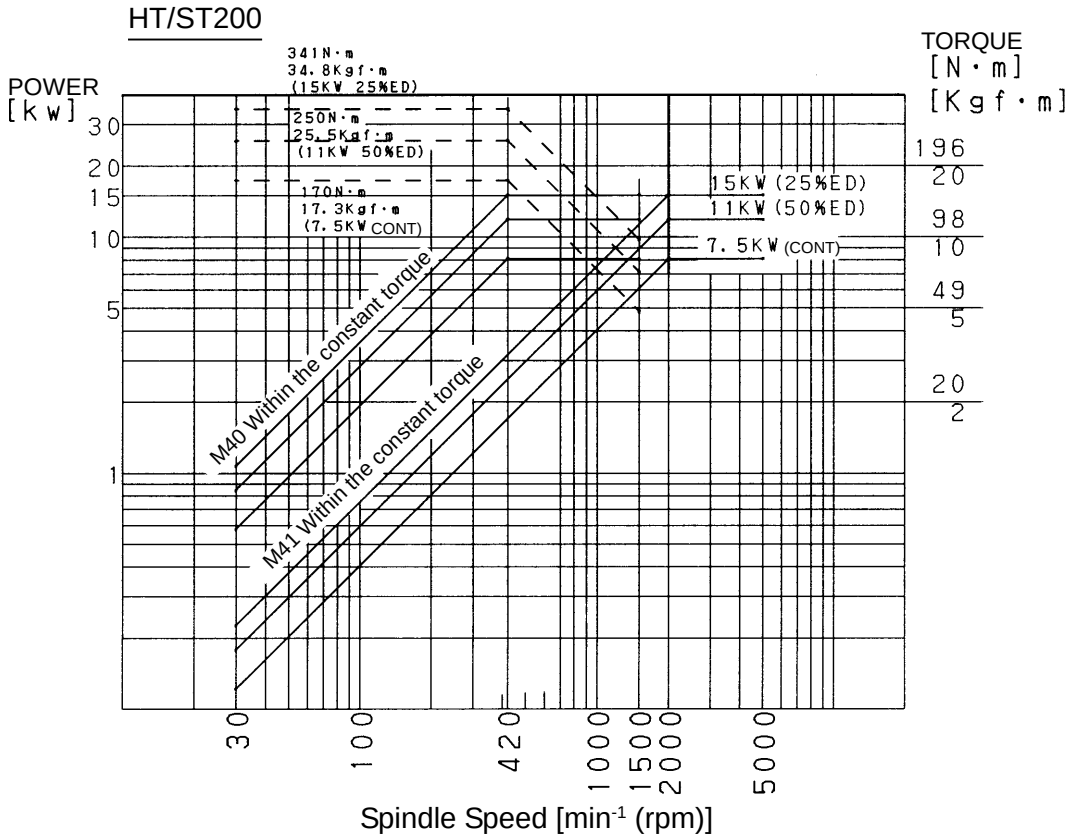
Spindle Speed [min^{-1} (rpm)]

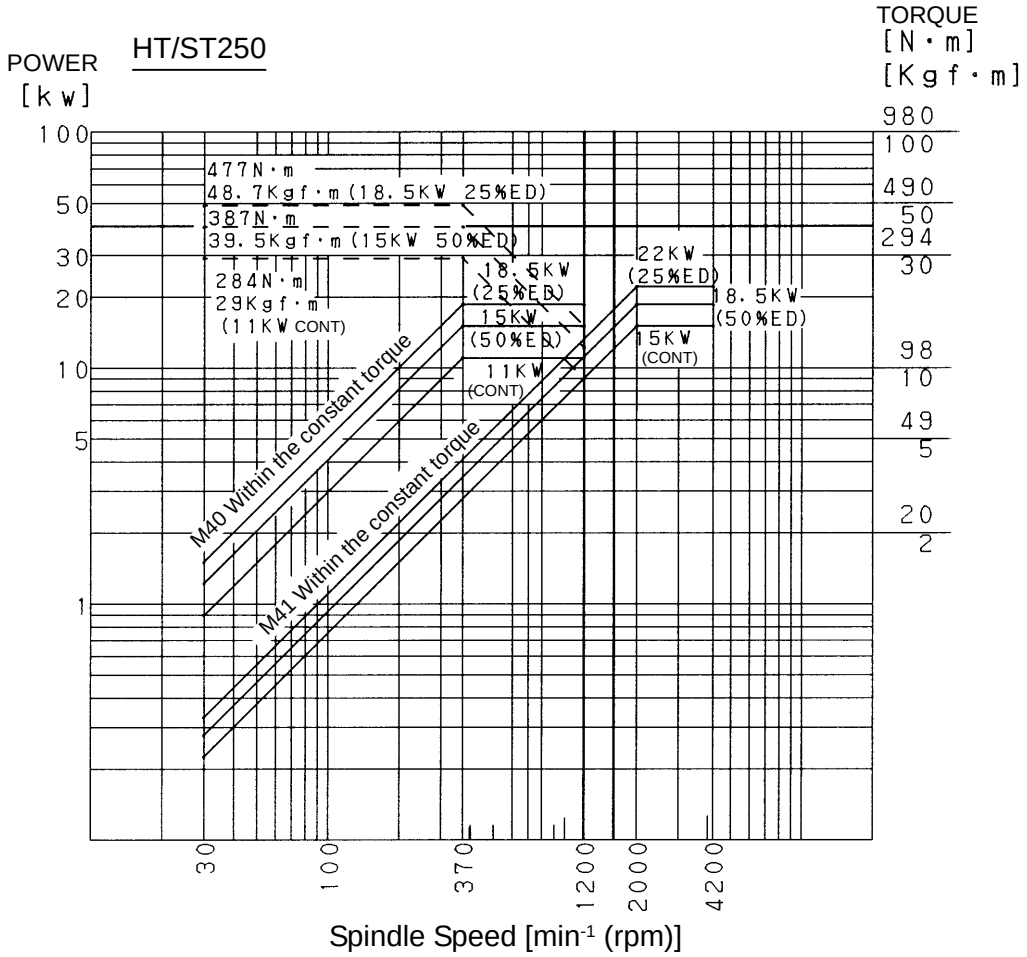
HT/ST250



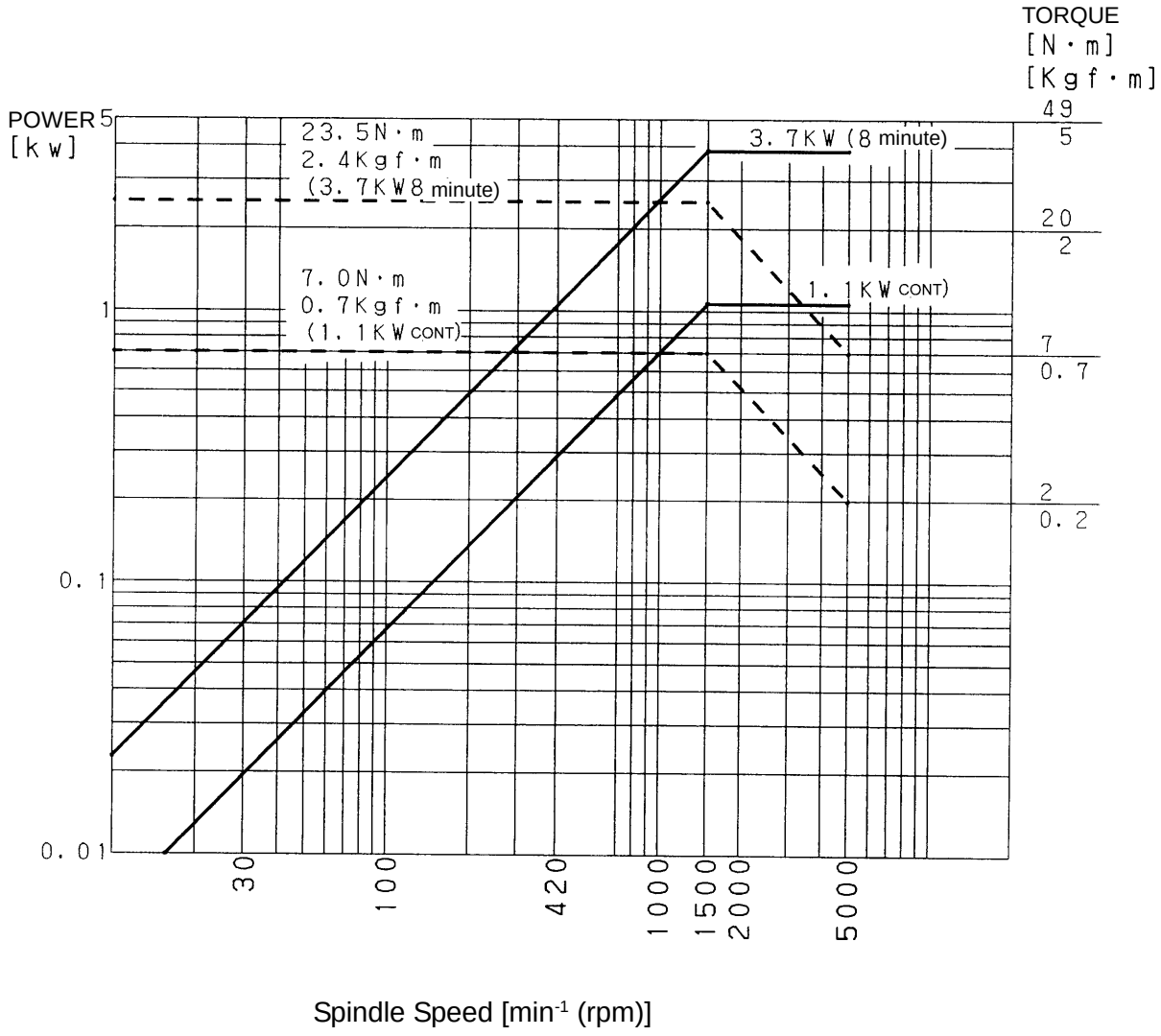
Spindle Speed [min^{-1} (rpm)]

Spindle Output Diagram(Builtin motor C-axis specifications)





Rotating Tool Spindle Output Diagram



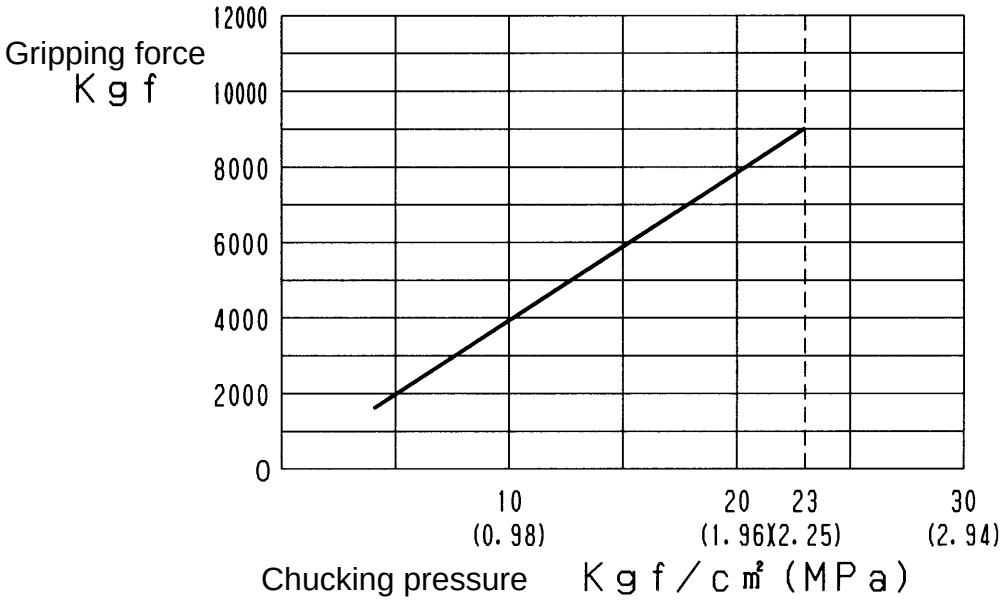
Spindle Speed [min^{-1} (rpm)]

3-5 Chucking Pressure-Gripping Force Diagram

HT/ST200

Chuck :ZA6-8-72B

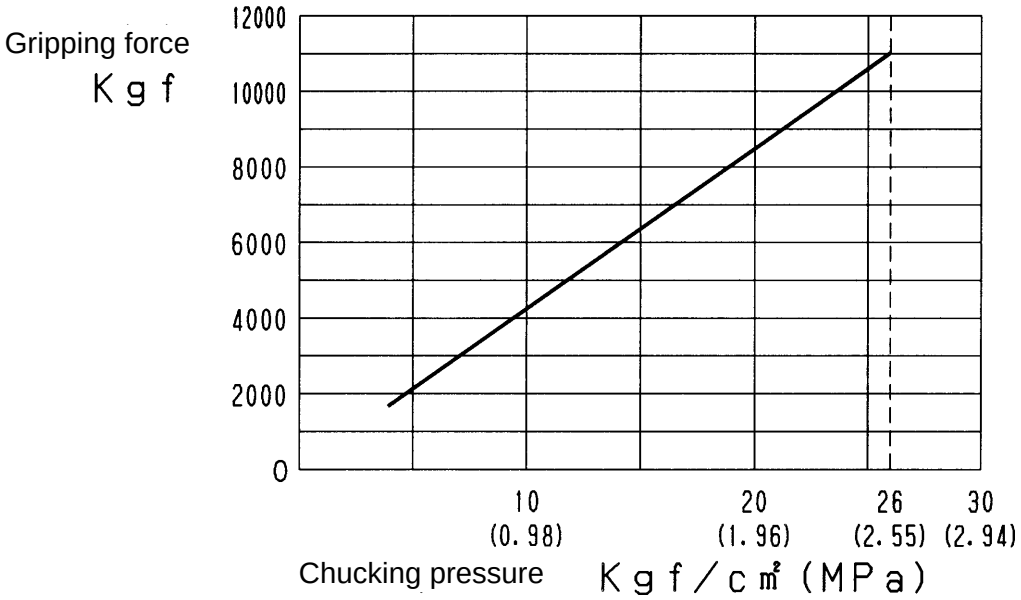
Cylinder :ZKP150-72-17-17



HT/ST250

Chuck :ZA8-10-82B

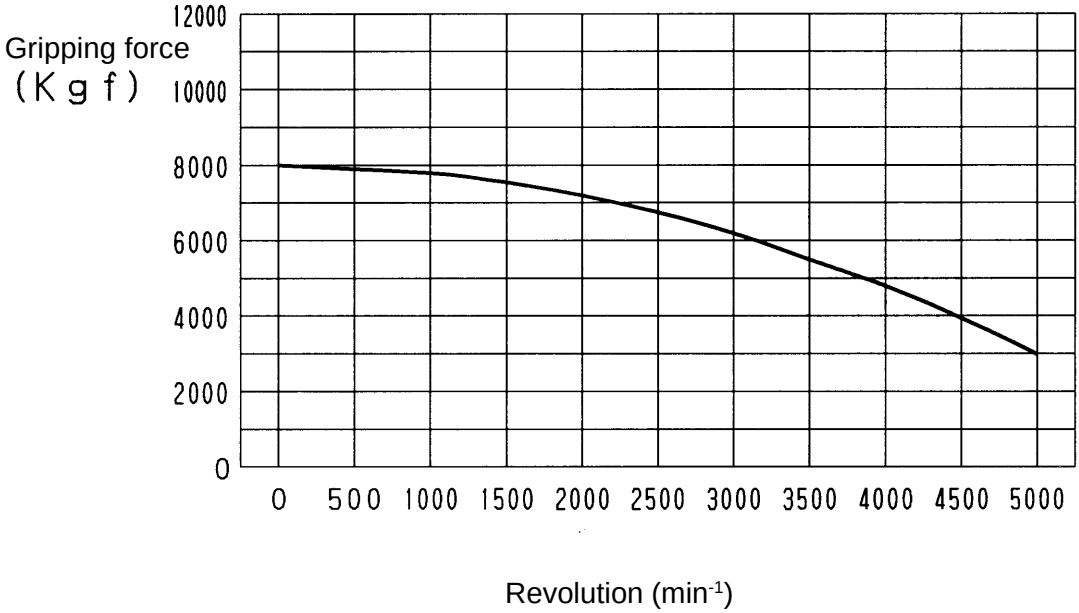
Cylinder :ZKP170-82-20-16



Chucking Pressure-Gripping Force Diagram

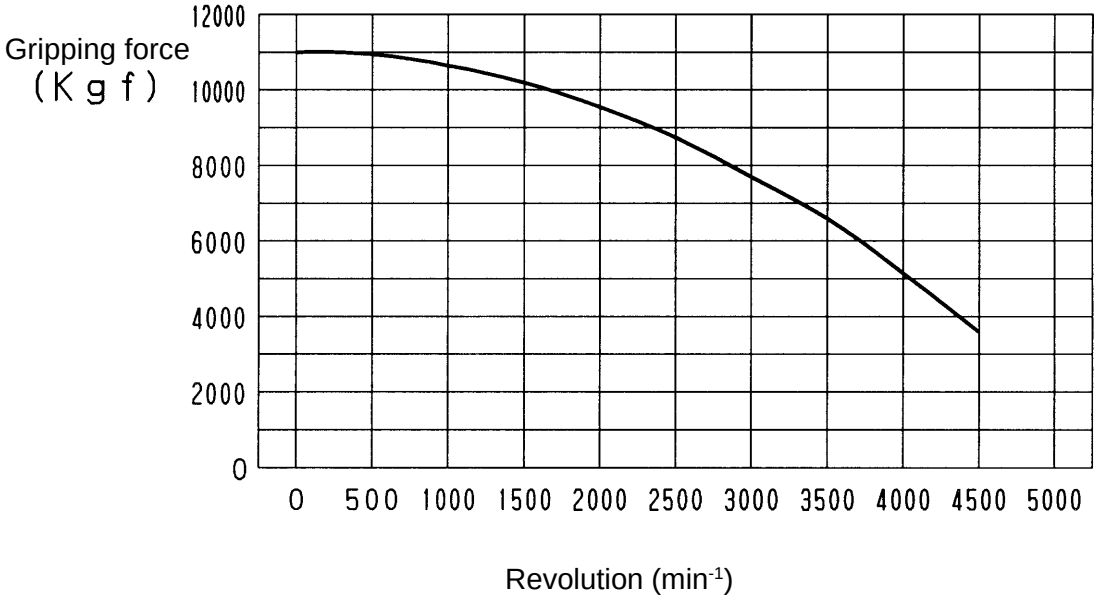
HT/ST200

Chuck : ZA6-8-72B



HT/ST250

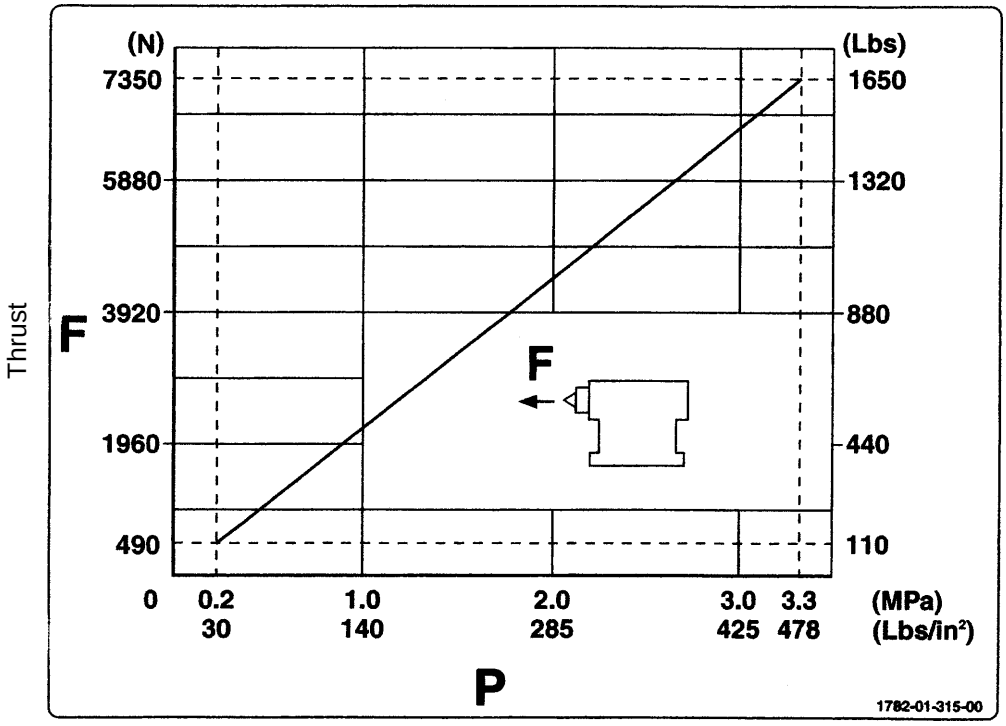
Chuck : ZA8-10-82B



3-6 Tailstock Pressure-Thrust Diagram

Relations between tailstock pressure and the thrust power are as shown in the diagram below. A pressusre adjusting valve is located on the left side of the machine.

Tailstock pressure adjustment should be made under the condition where a workpiece is being chucked and pushed by the tailstock.



Thrust

Pressure

As a guidance, for material ϕ100×300.....S45C
or equivalent, the value of thrust is about 200kgf.

When used below the set pressure 1MPa(10 kgf/cm^2, 142 lbs/in^2), moving speed of the tailstock is lowered.

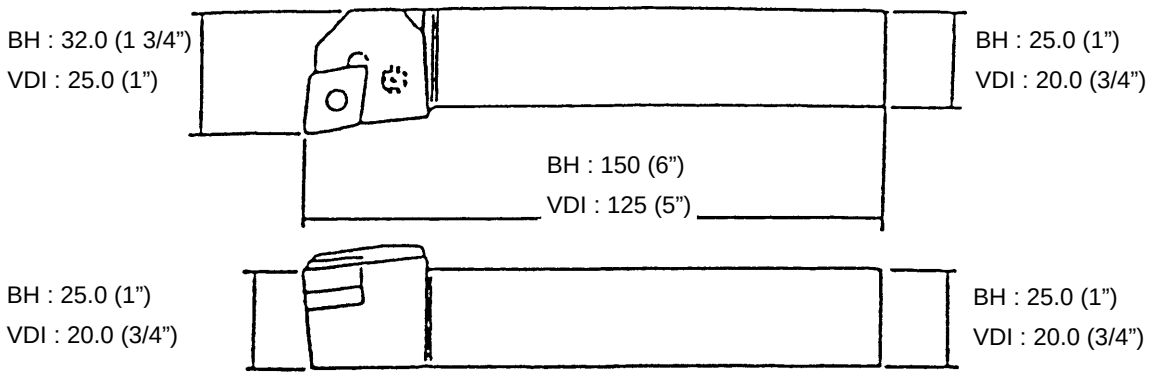
3-7 Method of Obtaining Tool Center Height

Dimension : metric (mm)
inch (”)

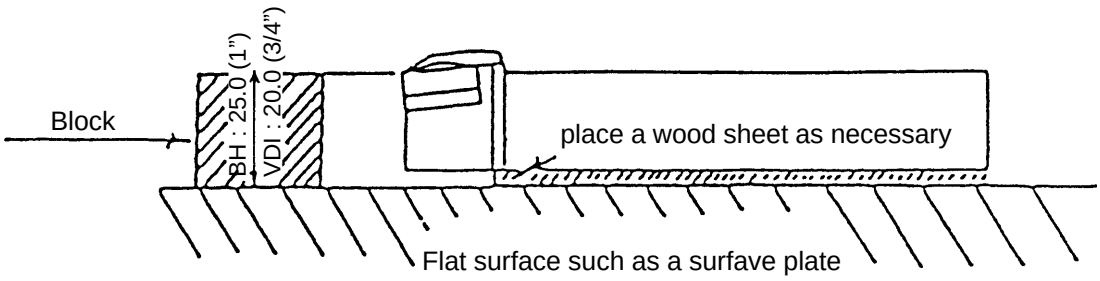
The height of the outside diameter tool is 25mm on the base holder turret head.

On the VDI rotating tool turret head, the hight is 20mm.

Base Holder turret : BH
VDI rotating tool turret : VDI



1. When center height must be adjusted with O.D. tools, make adjustment of height, putting a spacer; etc.



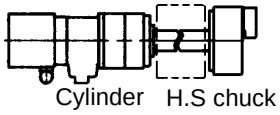
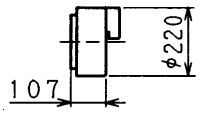
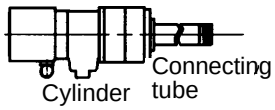
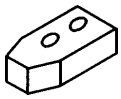
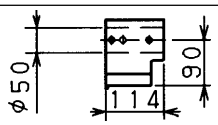
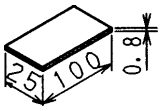
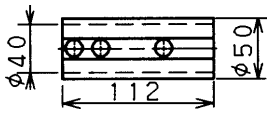
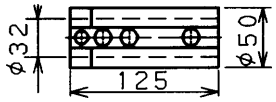
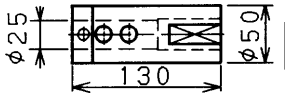
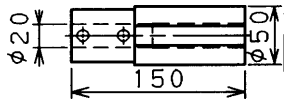
Attach the tool to the support,after adjusting the heigh with 25mm block gauge outside the machine

4. TOOLING SYSTEM

4-1 12st. Base Holder Turret Head Combination Tool List (Standard)

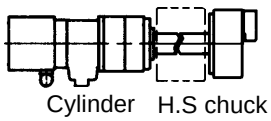
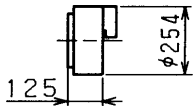
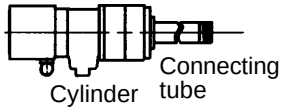
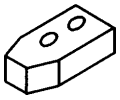
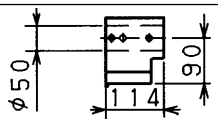
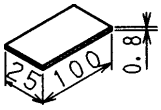
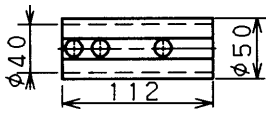
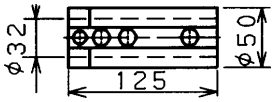
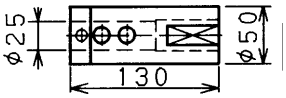
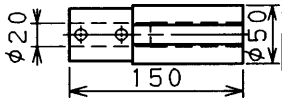
4-1-1 HT/ST200

(1/1)

Cl.	PARTS NO	NAME	SKETCH	DESCRIPTION
Chuck	1782-MC-101-00	Hydraulic power chuck (big bore type)		ϕ220 big bore chuck (A2-6) Hollow cylinder Soft jaw 1piece
	1594-109-59-00	Power chuck (Unit:1 set)		ϕ220 big bore chuck (MATUMOTO) Bore ID. ϕ72 ZA6-8-72B-05
	1594-109-60-00	Cylinder (Unit: 1 set)		Hollow cylinder (MATUMOTO) ZKP150/72-17 Coolant recovery cover, Draw tube, anti-turning stay
	1594-113-09-00	Soft jaw		ϕ220 big bore chuck 3pieces set
Base holder	1782-40-009-00	Base holder for I.D. cutting		
OD Tools	1593-028-01-00	Spacer for the reverse cutting		it is required when carrying out reverse cutting of an O.D.
ID Tools	1596-347-15-00	Boring bar socket for ϕ40 shank		
	1596-347-16-00	Boring bar socket for ϕ32 shank		
	1596-347-17-00	Boring bar socket for ϕ25 shank		
	1596-346-04-00	Boring bar socket for ϕ20 shank		

4-1-2 HT/ST250

(1/1)

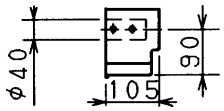
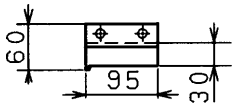
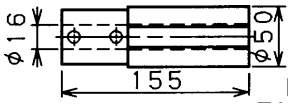
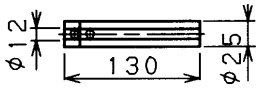
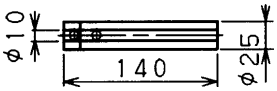
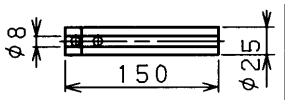
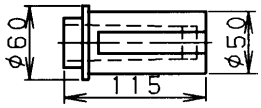
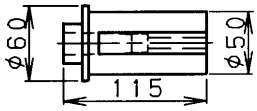
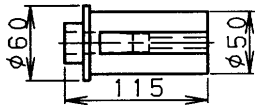
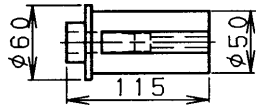
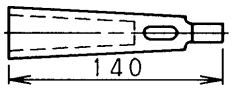
Cl.	PARTS NO	NAME	SKETCH	DESCRIPTION
Chuck	1782-MC-103-00	Hydraulic power chuck (big bore type)		ϕ254 big bore chuck (A2-8) Hollow cylinder Soft jaw 1piece
	1594-109-64-00	Power chuck (Unit:1 set)		ϕ254 big bore chuck (MATUMOTO) Bore ID. ϕ82 ZA8-10-82B-02
	1594-109-65-00	Cylinder (Unit: 1 set)		Hollow cylinder (MATUMOTO) ZKP170/82-20 Coolant recovery cover, Draw tube, anti-turning stay
	1594-113-01-00	Soft jaw		ϕ254 big bore chuck 3pieces set
Base holder	1782-40-009-00	Base holder for I.D. cutting		
OD Tools	1593-028-01-00	Spacer for the reverse cutting		it is required when carrying out reverse cutting of an O.D.
ID Tools	1596-347-15-00	Boring bar socket for ϕ40 shank		
	1596-347-16-00	Boring bar socket for ϕ32 shank		
	1596-347-17-00	Boring bar socket for ϕ25 shank		
	1596-346-04-00	Boring bar socket for ϕ20 shank		

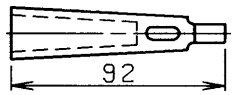
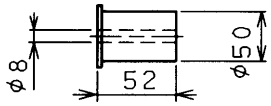
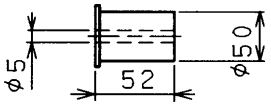
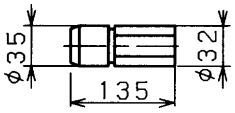
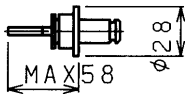
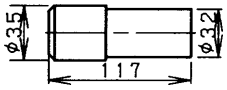
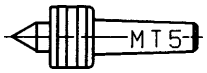
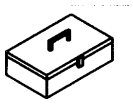
4-2 12st. Base HolderTurret Head Combination Tool List (Selection)

4-2-1 HT200/250, ST200/250

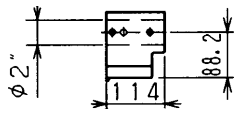
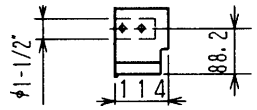
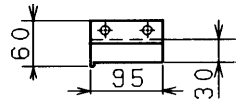
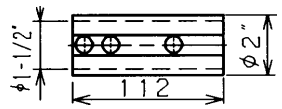
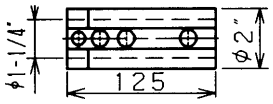
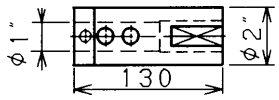
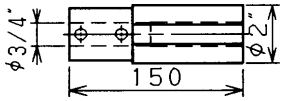
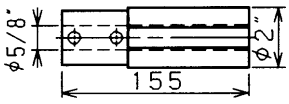
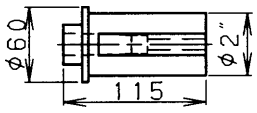
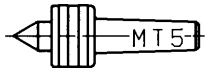
(MT)

(1/2)

CI	PARTS NO	NAME	SKETCH	DESCRIPTION
Base holder	1782-40-011-00	Base holder for U-drill		Socket for ϕ32, 25, 20 1pc each. Can be used both for whistle notch shank ISO shank
	1782-40-013-00	Base holder for face grooving		
ID Tool	1596-346-05-00	Boring bar socket for ϕ16 shank		
	1593-340-13-00	Boring bar socket for ϕ12 shank		
	1593-340-14-10	Boring bar socket for ϕ10 shank		
	1593-340-15-10	Boring bar socket for ϕ8 shank		
Drilling Tools	1596-337-04-00	MT No.4 Drill socket		For ϕ32~ϕ50 Morse taper shank drill
	1596-337-03-00	MT No. 3 Drill socket		For ϕ23~ϕ32 Morse taper shank drill
	1596-337-02-00	MT No. 2 Drill socket		For ϕ14~ϕ23 Morse taper shank drill
	1596-337-01-00	MT No.1 Drill socket		For ϕ14 or less Morse taper shank drill
	1594-337-03-00	MT4 × MT3 Drill sleeve		

CI	PARTS NO	NAME	SKETCH	DESCRIPTION
Drilling Tools	1594-337-04-00	MT2 × MT1 Drill sleeve		
	1782-95-001-00	Socket for ϕ8 center drill		
	1782-95-002-00	Socket for ϕ5 center drill		
Tap holder	1593-347-01-00	Tapper		S32-Z12-87.5L (NIKKEN) Need ϕ32 socket
	1593-347-02-00~08	Tap collet		ZMK12 Without torque limitter M3,4,5,6,8,10,12,14,16
Others	1593-419-01-00	Revolving bar stopper		Rotation type bar stopper Need socket ϕ32
Live center	1594-340-03-20	Live center		LC5X-7W(NSK)
Special Acces-sory		Spanners and wrenches (With tool box)		1. Grease gun, oiler, philips screw-drivers (medium, large), slotted screw-driver 2. Open end spanners 10×13, 14×17, 19×24, 27×30, 36×41 3. Simple spanner 22 4. Hexagonal bar wrenches 3, 4, 5, 6, 8, 10, 14

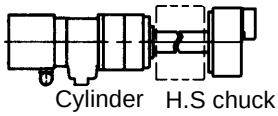
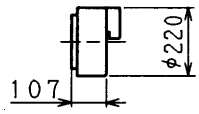
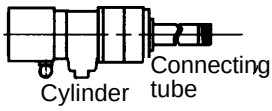
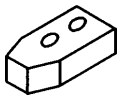
(INCH) (1/1)

CI	PARTS NO	NAME	SKETCH	DESCRIPTION
Base Holder	1782-40-010-00	I.D holder		
	1782-40-012-00	Oil-hole drill holder		Include φ1-1/4", φ1", φ3/4" socket 1pc each. For Kennametal "Drill-Fix (DFT)"
	1782-40-014-00	Face grooving holder		
I.D tool	1596-347-18-00	Boring bar socket 1-1/2"		
	1596-347-19-00	Boring bar socket 1-1/4"		
	1596-347-20-00	Boring bar socket 1"		
	1596-347-04-00	Boring bar socket 3/4"		
	1596-347-05-00	Boring bar socket 5/8"		
Drill tool	1596-337-06-00	Drill socket MT2		
Live center	1594-340-03-20	Live center		MT5 shank Max 5000min^{-1} LC5X-7W(NSK)

4-3 12st. QCT(KV) Turret Head Combination Tool List (Standard)

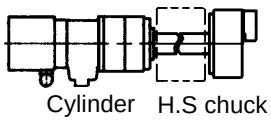
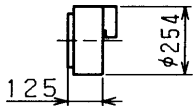
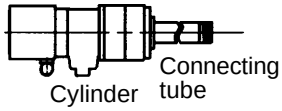
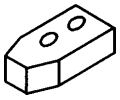
4-3-1 HT/ST200

(1/1)

CI.	PARTS NO	NAME	SKETCH	DESCRIPTION
Chuck	1782-MC-101-00	Hydraulic power chuck (big bore type)		ϕ220 big bore chuck (A2-6) Hollow cylinder Soft jaw 1piece
	1594-109-59-00	Power chuck (Unit:1 set)		ϕ220 big bore chuck (MATUMOTO) Bore ID. ϕ72 ZA6-8-72B-05
	1594-109-60-00	Cylinder (Unit: 1 set)		Hollow cylinder (MATUMOTO) ZKP150/72-17 Coolant recovery cover, Draw tube, anti-turning stay
	1594-113-09-00	Soft jaw		ϕ220 big bore chuck 3pieces set

4-3-2 HT/ST250

(1/1)

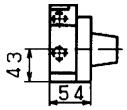
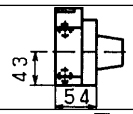
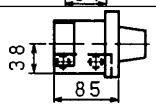
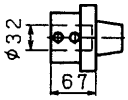
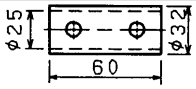
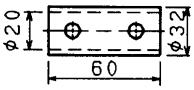
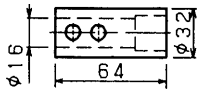
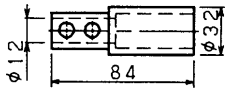
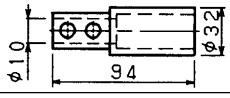
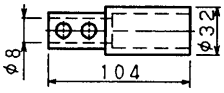
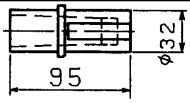
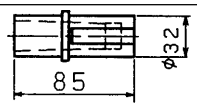
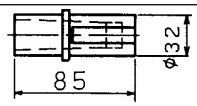
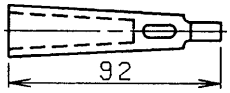
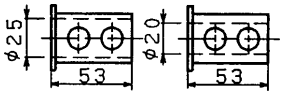
CI.	PARTS NO	NAME	SKETCH	DESCRIPTION
Chuck	1782-MC-103-00	Hydraulic power chuck (big bore type)		ϕ254 big bore chuck (A2-8) Hollow cylinder Soft jaw 1piece
	1594-109-64-00	Power chuck (Unit:1 set)		ϕ254 big bore chuck (MATUMOTO) Bore ID. ϕ82 ZA8-10-82B-02
	1594-109-65-00	Cylinder (Unit: 1 set)		Hollow cylinder (MATUMOTO) ZKP170/82-20 Coolant recovery cover, Draw tube, anti-turning stay
	1594-113-01-00	Soft jaw		ϕ254 big bore chuck 3pieces set

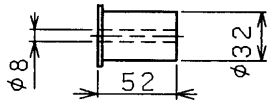
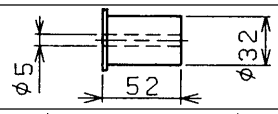
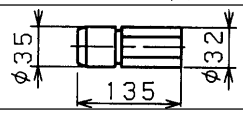
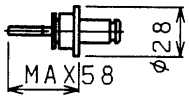
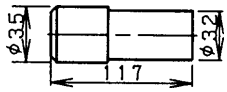
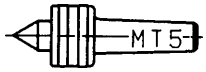
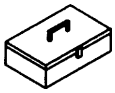
4-4 12st. QCT(KV) Turret Head Combination Tool List (Selection)

4-2-1 HT200/250, ST200/250

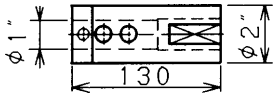
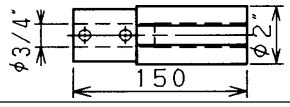
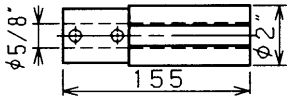
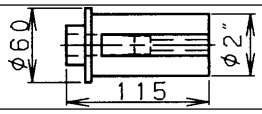
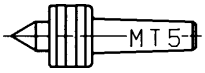
(1/2)

(MT)

CI	PARTS NO	NAME	SKETCH	DESCRIPTION
Base holder	1593-352-01-00	Base holder for outer figure cutting		QCT40-TA25
	1593-352-02-00	Base holder for outer figure copying		QCT40-TB25
	1593-352-03-00	Base holder for face grooving		QCT40-TC25
	1593-331-35-00	Base holder used both I.D cutting U-drill		QCT40-SU32
ID Tool	1593-667-20-00	Boring bar socket for ϕ25 shank		
	1593-667-21-00	Boring bar socket for ϕ20 shank		
	1593-667-22-00	Boring bar socket for ϕ16 shank		
	1593-667-23-00	Boring bar socket for ϕ12 shank		
	1593-667-24-00	Boring bar socket for ϕ10 shank		
	1593-667-25-00	Boring bar socket for ϕ8 shank		
Drilling Tools	1593-337-09-00	MT No. 3 Drill socket		For ϕ23~ϕ32 Morse taper shank drill
	1593-337-10-00	MT No. 2 Drill socket		For ϕ14~ϕ23 Morse taper shank drill
	1593-337-43-00	MT No. 1 Drill socket		For ϕ14 or less Morse taper shank drill
	1593-337-04-00	MT2 × MT1 Drill sleeve		
	1593-342-01-00	Socket for U-drill		ϕ20, 25 1pc each set. Can be used both for whistle notch shank ISO shank

CI	PARTS NO	NAME	SKETCH	DESCRIPTION
Drilling Tools	1594-331-54-01	Socket for ϕ8 center drill		
	1594-331-55-01	socket for ϕ5 center drill		
Tap holder	1593-347-01-00	Tapper		S32-Z12-87.5L (NIKKEN) Need ϕ32 socket
	1593-347-02-00~08	Tap collet		ZMK12 Without torque limitter M3,4,5,6,8,10,12,14,16
Others	1593-419-01-00	Revolving bar stopper		Rotation type bar stopper
Live center	1594-340-03-20	Live center		LC5X-7W(NSK)
Special Acces-sory		Spanners and wrenches (With tool box)		1. Grease gun, oiler, philips screw-drivers (medium, large), slotted screw-driver 2. Open end spanners 10×13, 14×17, 19×24, 27×30, 36×41 3. Simple spanner 22 4. Hexagonal bar wrenches 3, 4, 5, 6, 8, 10, 14

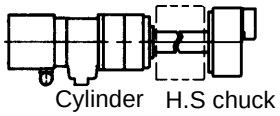
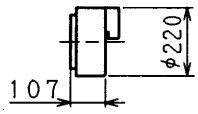
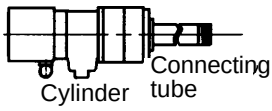
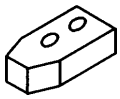
(INCH) (1/1)

CI	PARTS NO	NAME	SKETCH	DESCRIPTION
I.D Tool	1596-347-20-00	Boring bar socket 1”		
	1596-347-04-00	Boring bar socket 3/4”		
	1596-347-05-00	Boring bar socket 5/8”		
Drill tool	1596-337-06-00	Drill socket MT2		
Live center	1594-340-03-20	Live center		MT5 shank Max 5000min^{-1} LC5X-7W(NSK)

4-5 12st. VDI Turret Head Combination Tool List (Standard)

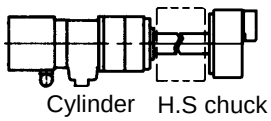
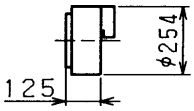
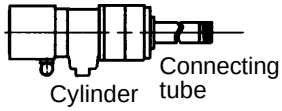
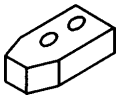
4-5-1 HT/ST200

(1/1)

CI.	PARTS NO	NAME	SKETCH	DESCRIPTION
Chuck	1782-MC-101-00	Hydraulic power chuck (big bore type)		ϕ220 big bore chuck (A2-6) Hollow cylinder Soft jaw 1piece
	1594-109-59-00	Power chuck (Unit:1 set)		ϕ220 big bore chuck (MATUMOTO) Bore ID. ϕ72 ZA6-8-72B-05
	1594-109-60-00	Cylinder (Unit: 1 set)		Hollow cylinder (MATUMOTO) ZKP150/72-17 Coolant recovery cover, Draw tube, anti-turning stay
	1594-113-09-00	Soft jaw		ϕ220 big bore chuck 3pieces set

4-5-2 HT/ST250

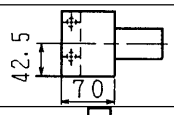
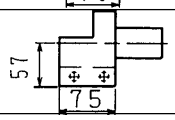
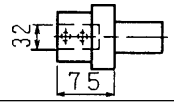
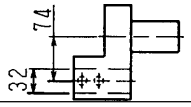
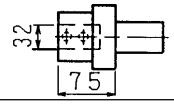
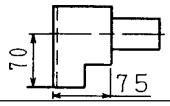
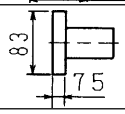
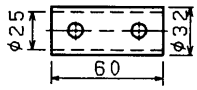
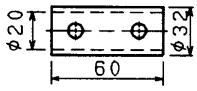
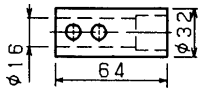
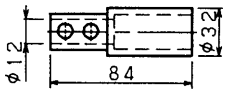
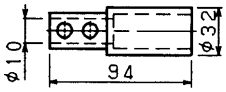
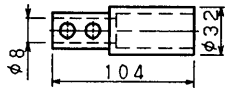
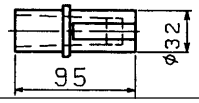
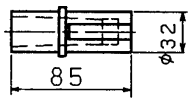
(1/1)

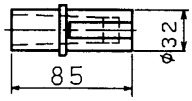
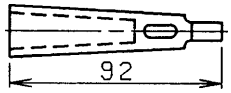
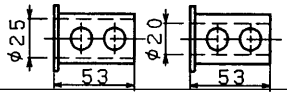
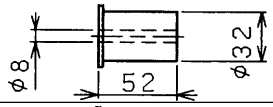
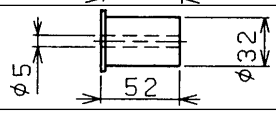
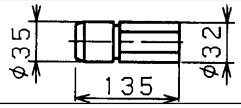
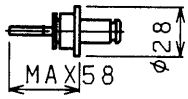
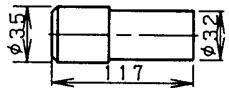
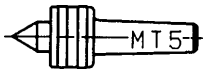
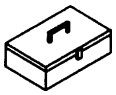
CI.	PARTS NO	NAME	SKETCH	DESCRIPTION
Chuck	1782-MC-103-00	Hydraulic power chuck (big bore type)		ϕ254 big bore chuck (A2-8) Hollow cylinder Soft jaw 1piece
	1594-109-64-00	Power chuck (Unit:1 set)		ϕ254 big bore chuck (MATUMOTO) Bore ID. ϕ82 ZA8-10-82B-02
	1594-109-65-00	Cylinder (Unit: 1 set)		Hollow cylinder (MATUMOTO) ZKP170/82-20 Coolant recovery cover, Draw tube, anti-turning stay
	1594-113-01-00	Soft jaw		ϕ254 big bore chuck 3pieces set

4-6 12st. VDI Turret Head Combination Tool List (Selection)

4-6-1 HT200/250, ST200/250

(1/2)

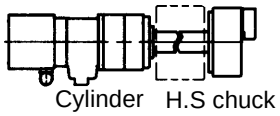
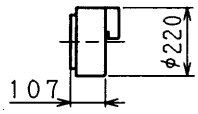
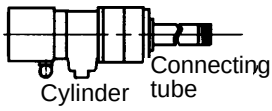
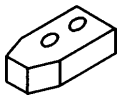
CI	PARTS NO	NAME	SKETCH	DESCRIPTION
Base holder	1742-67-080-00	Base holder for O.D. cutting		1742-67-442-
	1742-67-086-00	Base holder for face grooving (Offset)		1742-67-505-
	1742-67-079-00	Base holder for I.D. cutting		1742-67-443-
	1742-67-081-00	Base holder for I.D. cutting (Offset)		1742-67-473-
	1593-331-29-00	Base holder for U-drill		1742-67-674-
	1742-68-006-10	Base holder for cutting-off		1742-67-558-/1742-67-670-
	1593-355-03-00	Base holder for plug		1742-67-568-
ID Tool	1593-667-20-00	Boring bar socket for ϕ25 shank		
	1593-667-21-00	Boring bar socket for ϕ20 shank		
	1593-667-22-00	Boring bar socket for ϕ16 shank		
	1593-667-23-00	Boring bar socket for ϕ12 shank		
	1593-667-24-00	Boring bar socket for ϕ10 shank		
	1593-667-25-00	Boring bar socket for ϕ8 shank		
Drilling Tools	1593-337-09-00	MT No. 3 Drill socket		For ϕ23~ϕ32 Morse taper shank drill
	1593-337-10-00	MT No. 2 Drill socket		For ϕ14~ϕ23 Morse taper shank drill

CI	PARTS NO	NAME	SKETCH	DESCRIPTION
Drilling Tools	1593-337-43-00	MT No. 1 Drill socket		For φ14 or less Morse taper shank drill
	1593-337-04-00	MT2×MT1 Drill sleeve		
	1593-342-01-00	Socket for U-drill		φ20, 25 1pc each set. Can be used both for whistle notch shank ISO shank
	1594-331-54-01	Socket for φ8 center drill		
	1594-331-55-01	Socket for φ5 center drill		
Tap holder	1593-347-01-00	Tapper		S32-Z12-87.5L (NIKKEN) Need φ32 socket
	1593-347-02-00~08	Tap collet		ZMK12 Without torque limitter M3,4,5,6,8,10,12,14,16
Others	1593-419-01-00	Revolving bar stopper		Rotation type bar stopper
Live center	1594-340-03-20	Live center		LC5X-7W(NSK)
Special Acces-sory		Spanners and wrenches (With tool box)		1. Grease gun, oiler, philips screw-drivers (medium, large), slotted screw-driver 2. Open end spanners 10×13, 14×17, 19×24, 27×30, 36×41 3. Simple spanner 22 4. Hexagonal bar wrenches 3, 4, 5, 6, 8, 10, 14

4-7 12st.VDI Rotating Tool Turret Head Combination Tool List (Standard)

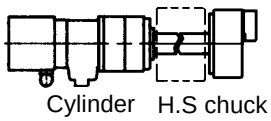
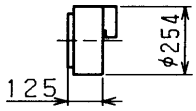
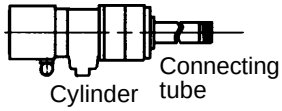
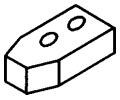
4-7-1 HT/ST200

(1/1)

CI.	PARTS NO	NAME	SKETCH	DESCRIPTION
Chuck	1782-MC-101-00	Hydraulic power chuck (big bore type)		ϕ220 big bore chuck (A2-6) Hollow cylinder Soft jaw 1piece
	1594-109-59-00	Power chuck (Unit:1 set)		ϕ220 big bore chuck (MATUMOTO) Bore ID. ϕ72 ZA6-8-72B-05
	1594-109-60-00	Cylinder (Unit: 1 set)		Hollow cylinder (MATUMOTO) ZKP150/72-17 Coolant recovery cover, Draw tube, anti-turning stay
	1594-113-09-00	Soft jaw		ϕ220 big bore chuck 3pieces set

4-7-2 HT/ST250

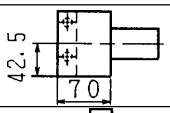
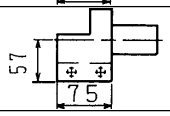
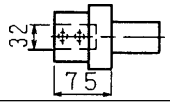
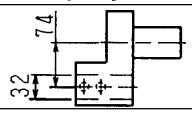
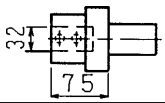
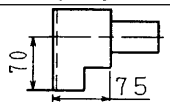
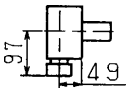
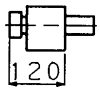
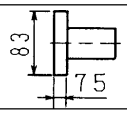
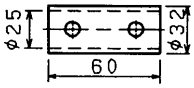
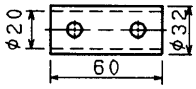
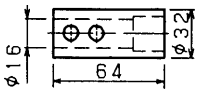
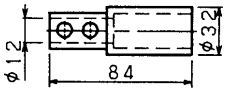
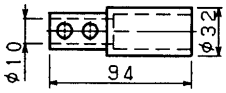
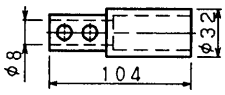
(1/1)

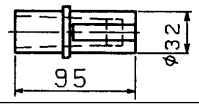
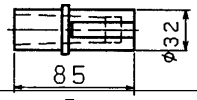
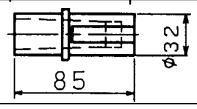
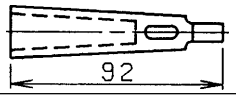
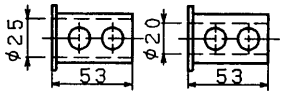
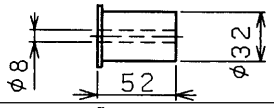
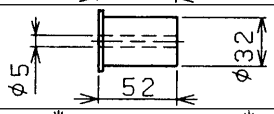
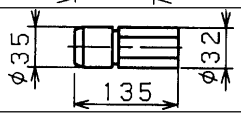
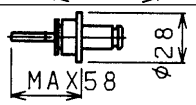
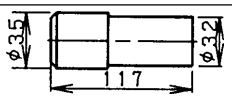
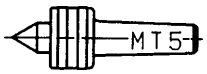
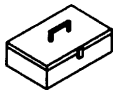
CI.	PARTS NO	NAME	SKETCH	DESCRIPTION
Chuck	1782-MC-103-00	Hydraulic power chuck (big bore type)		ϕ254 big bore chuck (A2-8) Hollow cylinder Soft jaw 1piece
	1594-109-64-00	Power chuck (Unit:1 set)		ϕ254 big bore chuck (MATUMOTO) Bore ID. ϕ82 ZA8-10-82B-02
	1594-109-65-00	Cylinder (Unit: 1 set)		Hollow cylinder (MATUMOTO) ZKP170/82-20 Coolant recovery cover, Draw tube, anti-turning stay
	1594-113-01-00	Soft jaw		ϕ254 big bore chuck 3pieces set

4-8 12st. VDI Rotating Tool Turret Head Combination Tool List (Selection)

4-8-1 HT200/250, ST200/250

(1/2)

CI	PARTS NO	NAME	SKETCH	DESCRIPTION
Base holder	1742-67-080-00	Base hgolder for O.D cutting		1742-67-442-
	1742-67-086-00	Base holder for face grooving (Offset)		1742-67-505-
	1742-67-079-00	Base holder for I.D. cutting		1742-67-443-
	1742-67-081-00	Base holder for I.D. cutting (Offset)		1742-67-473-
	1593-331-29-00	Base holder for U-drill		1742-67-674-
	1742-68-006-10	Base holder for cutting-off		1742-67-558-/1742-67-670-
	1782-67-007-00	Base holder for X-axis rotating tool		
	1782-67-008-00	Base holder for Z-axis rotating tool		
	1593-355-03-00	Base holder for plug		1742-67-568-
ID Tool	1593-667-20-00	Boring bar socket for ϕ25 shank		
	1593-667-21-00	Boring bar socket for ϕ20 shank		
	1593-667-22-00	Boring bar socket for ϕ16 shank		
	1593-667-23-00	Boring bar socket for ϕ12 shank		
	1593-667-24-00	Boring bar socket for ϕ10 shank		
	1593-667-25-00	Boring bar socket for ϕ8 shank		

CI	PARTS NO	NAME	SKETCH	DESCRIPTION
Drilling Tools	1593-337-09-00	MT No. 3 Drill socket		For φ23~φ32 Morse taper shank drill
	1593-337-10-00	MT No. 2 Drill socket		For φ14~φ23 Morse taper shank drill
	1593-337-43-00	MT No. 1 Drill socket		For φ14 or less Morse taper shank drill
	1593-337-04-00	MT2 × MT1 Drill sleeve		
	1593-342-01-00	Socket for U-drill		φ20, 25 1pc each set. Can be used both for whistle notch shank ISO shank
	1594-331-54-01	Socket for φ8 center drill		
	1594-331-55-01	Socket for φ5 center drill		
Tap holder	1593-347-01-00	Tapper		S32-Z12-87.5L (NIKKEN) Need φ32 socket
	1593-347-02-00~08	Tap collet		ZMK12 Without torque limitter M3,4,5,6,8,10,12,14,16
Rotat-ing Tools	1596-352-11-00~14	Collet		ESX32 (D=2.5, 3 ~ 16)
	1596-352-00-00~05	Tap collet		ET32 (M3, 4, 5, 6, 8, 10, 12)
Others	1593-419-01-00	Revolving bar stopper		Rotation type ber stopper
Live center	1594-340-03-20	Live center		LC5X-7W(NSK)
Special Acces-sory		Spanners and wrenches (With tool box)		1. Grease gun, oiler, philips screw-drivers (medium, large), slotted screw-driver 2. Open end spanners 10×13, 14×17, 19×24, 27×30, 36×41 3. Simple spanner 22 4. Hexagonal bar wrenches 3, 4, 5, 6, 8, 10, 14

TURNING CENTER
HT200/250, ST200/250
INSTRUCTION MANUAL
SPECFICATION
SEICOS-pcFLexi
Version 1.01
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