



SC-450/450L



SC-450L

I N N O V A T I O N

NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

Nakamura-Tome
SC-450/450L

Multitasking Machine for Mass Production

Innovation Technology
Creating Value

New launch of a Machine
for Heavy and Large sized parts

1520mm Max. Turning length
 $\varphi 810$ mm Max. Swing Dia.



A large industrial machine, likely a lathe or mill, with a prominent circular opening at the top. A worker wearing a white hard hat and a grey uniform is visible in the lower right corner, working on a component of the machine. The scene is lit with a strong blue light, creating a high-tech, industrial atmosphere.

High rigid bed/slide structure for Heavy duty cutting performance

Traditionally hand-scraped and fitted slides

Spindle and slide units are mounted on the machine bed by high-qualified technicians, and each machine does not leave the production line before undergoing the most stringent quality control checks.

This machine does not only feature high capabilities, but also high performance and reliability, delivered from a machine-tool manufacturer fostering high accuracy and precision manufacturing technology over many years.

For Heavy and

SC-450

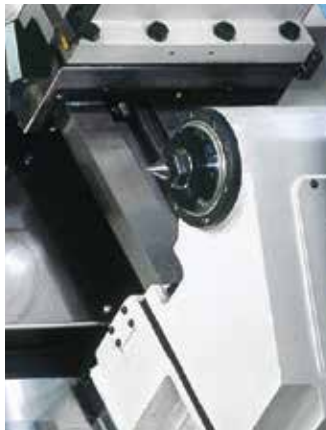


⌀810mm
Max. Swing Dia.

Medium to Large Size Heavy-Duty
High-Precision Cutting.



SC-450



Tailstock (op.)
Equipped with high-rigidity built-in center. The tailstock is positioned using the manual pulse generator, after manually connecting a knock to the Z-Axis saddle. Fully programmable automatic type (positioning with hydraulic cylinder) is optionally available.

- Quill taper : MT-4
- Quill stroke : 100mm
- Slide stroke : 760mm



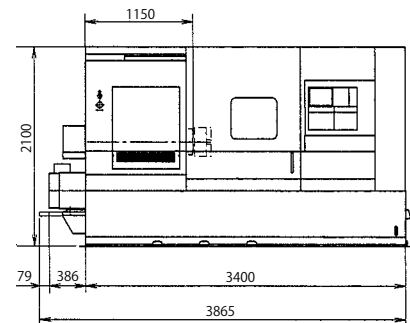
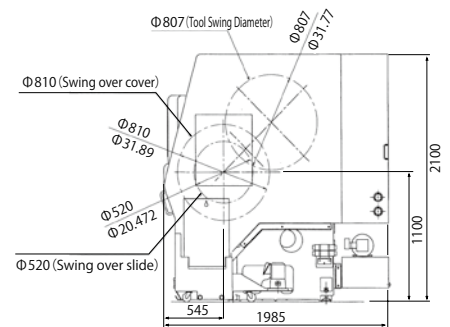
Heavy cutting - Machining ability max.9mm²

- Cutting speed : 120m/min
- Cutting depth : 10mm
- Feed : 0.9mm/rev
- Type of material : S45C

Milling function (op.)

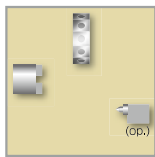

The machine can be optionally equipped with a 5.5/3.7kW high-output milling motor. Milling tools can be mounted on max. 12 stations. Driven-tools rotate independently. C-axis engagement time is only 1.5 sec. (from spindle to C-axis mode) C-axis minimum command increment is 0.001 degrees, enabling complex machining

- Driven-tool speed : MAX3,600min⁻¹
- Drill diameter : MAX φ 20mm
- Tap diameter : MAX M16



SC-450

Large-Swing Heavy-Duty Powerful Multi-tasking Machine

	Control FANUC 21i-TB	Turning Milling (op.)	Chuck size 12"/15"	Distance between center and spindle 1035mm	Max.turning diameter 465mm
	Max.turning length 785mm/12" 715mm/15"	Bar capacity 80mm	Spindle motor 30/22kW	Max spindle speed 2500min ⁻¹	Number of tool stations Dodecagonal turret 12st
	Tailstock (op.) MT-4 (Built-in dead center) 100mm (Quill std.)	Driven-tool motor 5.5/3.7kW 3600min ⁻¹	Y axis (op.) ± 70mm		

Large sized parts

New



SC-450L



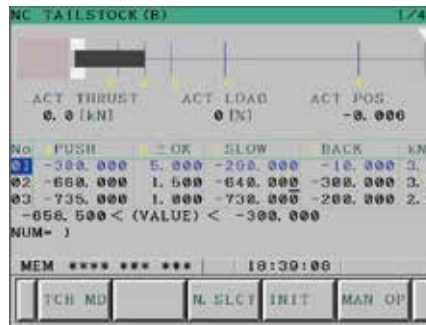
※ Alarm light is optionally available.

1520mm Max. Turning length
Φ810mm Max. Swing Dia.
Φ520mm Max. Workpiece Swing Diameter

The machine is equipped with box-way slides which are traditionally hand scraped by highly skilled technicians.



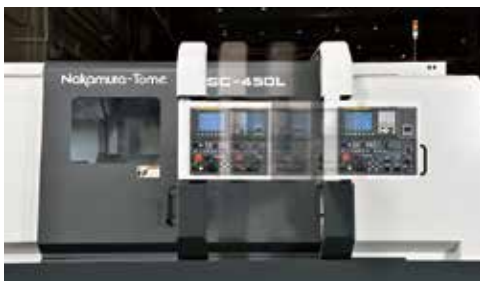
SC-450L



NC Servo driven Tailstock

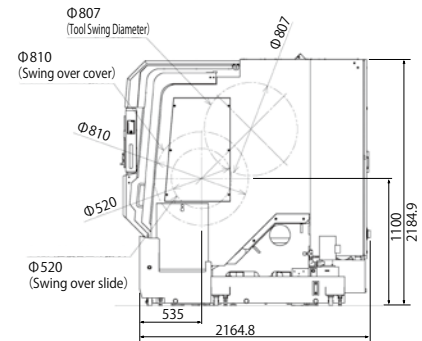
Tailstock body movement is program controlled by NC servo drive. The setting can be easily done on NT Nurse screen for maximum 12 settings. Each display can be call up by one touch on the NT Nurse button. Two displays can be shown on the same screen.

Drive system	NC Servo Drive system
Stroke	1490mm
Rapid Speed	15m/min
Thrust adjust range	2.5 ~ 6.5kN
MT Center shank f	MT-5 Rotating Center
	MT-4, MT-5 Built-in Center



Slide movable Operation Control Box

Operation Control Box is equipped with a large size LCD screen and each button has eye-friendly LED illumination switches. The control box can swing at 100 degrees and move 1m sideways to help easy operation.

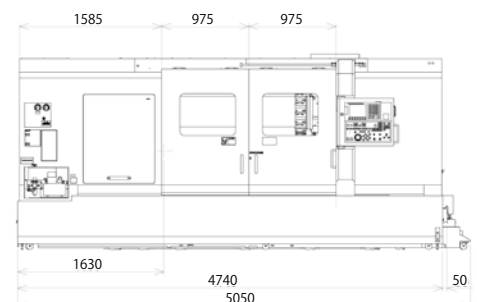


SC-450L

1520mm Max. Turning length, Heavy-Duty Powerful Multi-tasking Machine

	Control FANUC 0i-TD	Turning Milling (op.)	Chuck size 12"/305mm	Distance between center and spindle 1752mm	Max. turning diameter 480mm
	Max. turning length 1520mm	Bar capacity 81mm	Spindle motor 30/22kW	Max spindle speed 2500min ⁻¹	Number of tool stations Dodecagonal turret 12st
	Tailstock (op.) NC Servo driven MT-5	Driven-tool motor 5.5/3.7kW 3600min ⁻¹	Y axis (op.) ±70mm		

※ Built-in center (MT-4, MT-5) is an option



Jig less ! Set-up less ! Skill less !

■ This essential function for multitasking machines is standard.

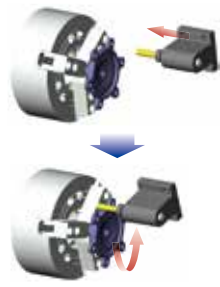
Safety Technology.

"Program and setup is difficult...." "If the machine stops during the process...." "Costly jigs and fixtures for Complex parts...." You may have similar production concerns. Having the NT Nurse system, NT Work Navigator and Overload detection, reduces manufacturing headaches and provides precious production support.

NT Work Navigator ACTIVE SAFETY

● Avoid a crash before it happens! **Z B C**
Material recognition function (G310/G312) can be used not only to avoid collisions, but also to optimize the face turning process for forgings that have different lengths. In addition, it is also useful for part-loading status confirmation, machining datum shift, and distinguishing different parts.

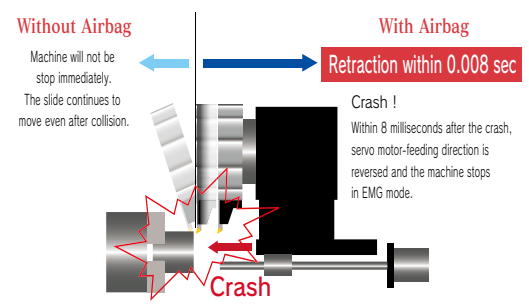
● No fixtures required
Machining parts with non-round shapes, such as forgings or castings requires that the raw part coordinates be recognized by the CNC control. In order to achieve this without requiring extra cost or additional options, the NT Navigator is used. It works just by touching the part with a simple inexpensive probe (mostly round bar mounted on a tool holder) and using the torque control feature of the servo-motor, which is to record required coordinates in the CNC. The NT Navigator is a cost cutting feature in multitasking machines, eliminating the need for positioning fixtures and special clamping devices.



Airbag (Overload detection) PASSIVE SAFETY

● No need to panic
When unavoidable human error results in machine collision, there is no reason to panic. All Nakamura-Tome machines are equipped with a safety feature called "airbag" (overload detection), which will greatly reduce the impact force and prevent heavy damage to the machine.

Nakamura-Tome machines will not break for the slightest collision, as other machines do.



*This feature does not mean zero impact.

NT Nurse System

● All-in-one Software Package
NT Nurse is software that provides the operator with user-friendly support for operation, programming and production on the machine. Among vital features are phase recognition (a must for multitasking), direct chucking to prevent positioning error during transfer, and

perfect synchronization of the left and right hand spindles. Among other features, are the load monitor for detecting tool wear and tool breakage, tool life management, operation condition monitoring, in addition to many other features to simplify programming, set up, operation and production, all offered in one single package.

SC-450										
Standard-Y-axis	Display	Standard	Monochrome 7.2"LCD	Part program storage length	Standard	80 m	Number of registered programs	Standard	125pcs	
FANUC 21i-TB		Luck-bei II (op.)	Color 10.4"LCD		Option	160 m		Option	200pcs	
						320 m		Tool offset pairs	Standard	32pairs
						640 m			Option	64pairs
		Luck-bei II (op.)	1280 m							
					Luck-bei II (op.)	320 m				

SC-450L												
Standard-Y-axis	Display	Standard	Color 8.4"LCD	Part program storage length	Standard	1280 m	Number of registered programs	Standard	400pcs			
FANUC 0i-TD		Luck-bei II (op.)	Color 10.4"LCD					Option	Standard	Tool offset pairs	Standard	64pairs
											Option	99pairs

※ Manual Handle Retrace is an option

SC-450L

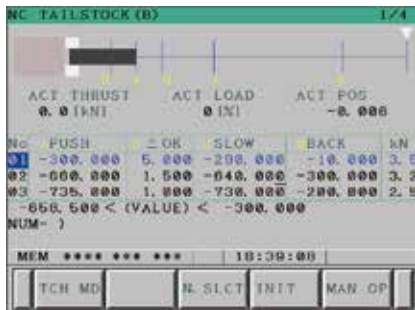


NT Nurse call button up to two NT Nurse frequently used functions can be registered and later called with in one-key stroke.

8.4inch Color LCD

Advanced NT Nurse

These are part of many functions.



● Tailstock (B-axis)



● Work-piece Status



● Load monitor

TOOL COUNTER 1/4

NO.	PRESET COUNT	NO.	PRESET COUNT	NO.	PRESET COUNT
0001	1000	323	0000	0	0
0002	2000	1104	0010	0	0
0003	2000	811	0011	0	0
0004	2000	525	0012	0	0
0005	1000	512	0013	0	0
0006	500	500	0014	0	0
0007	0	0	0015	0	0
0008	0	0	0016	0	0

MEM **** * 17:52:41

COUNT T-LIFE CONDTN SET (OPRT)

● Tool counter

TOOL LIFE

PRG/NO.	PRESET COUNT	TOOL1	TOOL2	TOOL3	TOOL4
01	2000	1104	0101	0202	0303
02	1000	0404	0505	0606	0707
03	0	0	0	0	0
04	0	0	0	0	0
05	0	0	0	0	0
06	0	0	0	0	0
07	0	0	0	0	0
08	0	0	0	0	0

MEM **** * 17:57:05

COUNT T-LIFE CONDTN SET (OPRT)

● Tool life (Spare tool call-up)

OPERAT CONDN (TOOL) 1/4

PRG/NO.	TCODE	MACH. TIM(S)	CUT. TIME(S)
00010	T0101	003.4	006.3
00020	T0202	003.0	003.0
00030	T0303	004.1	007.0
00040	T0404	007.2	008.0
00050	T0505	008.0	008.0
00060	T0606	008.0	008.0
00070	T0707	008.0	008.0
00080	T0808	008.0	008.0
00090	T0909	008.0	008.0
00100	T1000	008.0	008.0

MEM HOLD *** * 18:05:47

● Operation condition by tool number

OPERAT CONDITION

WORK COUNTER	TOTAL
PRESE 1000	COUNT 1000
MACH TIME LAST 0:00:03.8	THIS 0:00:00.0
AUTO OPE. COUNT	0:03:30
AUTO OPE. LAST 0:00:00	TODAY 0:00:00
POWER ON LAST 0:03:42	TODAY 0:18:21

MEM **** * 17:50:35

COUNT T-LIFE TOOL (OPRT)

● Operation Condition Display

QUICK OFST INPUT

WEAR NO.	1	3	4	7
TIMES	2	-7	2	-3
AMOUNT	6	-21	6	-9
WEAR	0.015	-0.000	-0.000	-0.018

MEM HOLD *** * 18:10:10

+/- + + + +

● Quick Offset Input

NT ALARM HISTRY 1/20

10/10/15 18:13:07
A00.0 EXTERNAL EMERGENCY STOP
10/10/15 18:11:50
A007 FEED HOLD
10/10/15 17:56:11
A500 G200 NOT COMMANDED AT TOP
10/08/20 22:07:38
A000 RESET
10/07/23 16:55:54
A602 WRONG TORQUE LIMITATION

MEM **** * 18:14:30

COUNT W_HIST CLEAR (OPRT)

● Alarm History Display

REGULAR MAINTN. 1/3

NO. ITEM	TERM	LEFT	T. CHECK
1 GREASING CHUCK	1WEEK	50h	↓
2 CLEANING INSIDE MACHINE	1WEEK	50h	↓
3 INSPECT SLIDE WIPERS	1MON	625h	↓
4 CLEANING FILTER OF COOLANT TANK	1MON	625h	↓
5 INSPECT COOLANT COVER WIPER	1MON	625h	↓

MEM **** * 18:46:59

FINISH HISTRY

● Periodical maintenance

NT NURSE MENU

1 TOOL COUNTER	11	A200101
2 TOOL LIFE	12	
3 OPERAT CONDITION	13	NC TAILSTOCK (B)
4 QUICK OFST INPUT	14	MAN-BEI
5 SETTING (SWITCH)	15	
6 OPERATION MESSAGE	16	
7 LOAD DISPLAY	17	WORK PIECE STATE
8 GUIDANCE	18	
9	19	REGULAR MAINTN.
10 WS-POSITION		

MEM **** * 17:54:20

COUNT T-LIFE CONDTN Q-OFST SWITCH

● Nurse Menu

OPERATION MESSAGE

A00.0 EXTERNAL EMERGENCY STOP
***** DETAILS *****
1. The OT limit switch of the X-axis or Z-axis is tripped.
2. The EMERGENCY STOP button on the operation panel is pressed.
3. The emergency stop signal is input from the LNS bar feeder.

MEM **** * 18:14:25

W DTIL A DTIL HISTRY ST. CHK REFER.

● Operation Message

M CODE LIST 3/4

(M20 - M29)

- *M20 FIXED AIR BLOW ON
- *M21 FIXED AIR BLOW OFF
- M22 SPINDLE SPEED REACH SIGNAL IGNORE
- M23 CHAMFERING ON
- M24 CHAMFERING OFF
- M25 ERROR DETECT ON
- M26 ERROR DETECT OFF
- M27 DRY RUN ON
- M28 DRY RUN OFF

MEM **** * 18:35:58

M CODE G CODE PCPARA PC TMR

● M-code list

LOAD LIMIT SETTING 1/6

TCODE	AX	TYPE	NORM	LIFE	BRK	LOWEL
1 0101	SP	Z	0.0	0.0	20.0	30.0
		Z	0.0	0.0	12.0	15.0
2 0202	SP	Z	0.0	0.0	11.0	18.0
		Z	0.0	0.0	14.0	21.0
3 0303	SP	Z	0.0	0.0	21.0	32.0
		Z	0.0	0.0	23.0	30.0

MEM **** * 18:34:23

CLEAR GRAPH TEACH MON CANCEL

● Load Control (Load monitor)

MAN-BEI SENSOR/OFF 1/4

1 L-MEASURE

MEASURED	MEASURED
+OK 1.000	+NG 0.000
-OK 0.000	+OK 1.000
-OK 0.000	-OK 0.000
-OK 0.000	-OK 0.000
-NG 0.000	-NG -1.000

MEM **** * 18:41:37

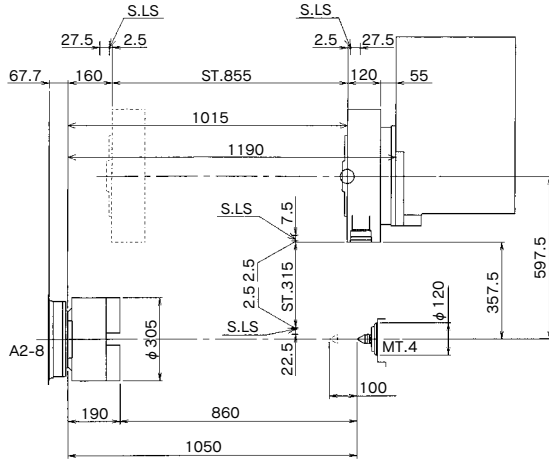
CONT OFF HISTRY CANCEL

● Han-bei Measuring

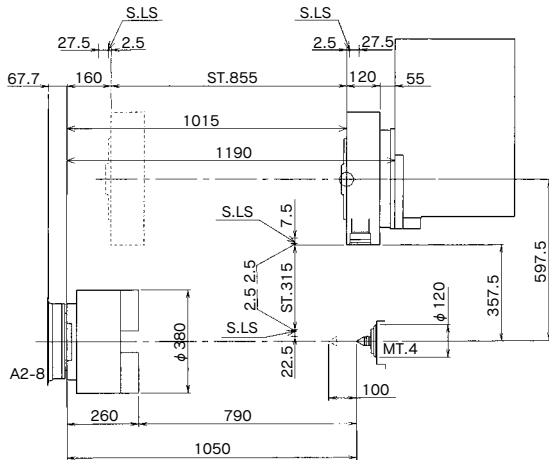
Stroke Interference

SC-450 Dodecagonal drum turret

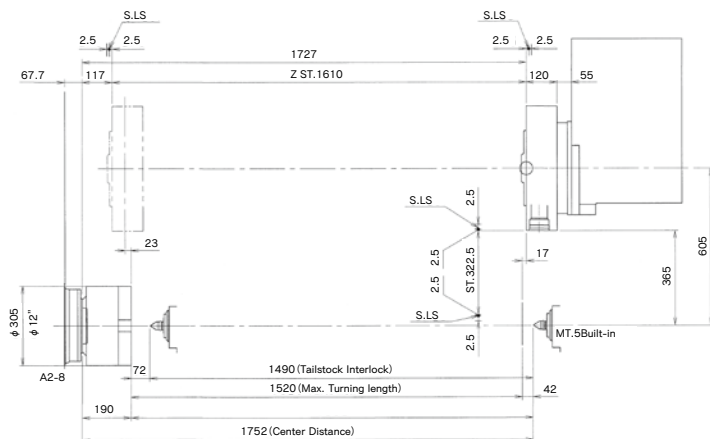
■ A Specification / Driven-Tools / 12 stations



■ B Specification / Driven-Tools/ 12 stations

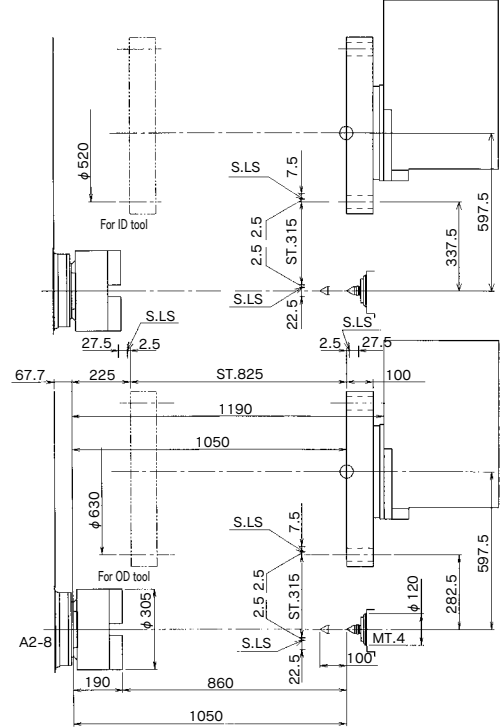


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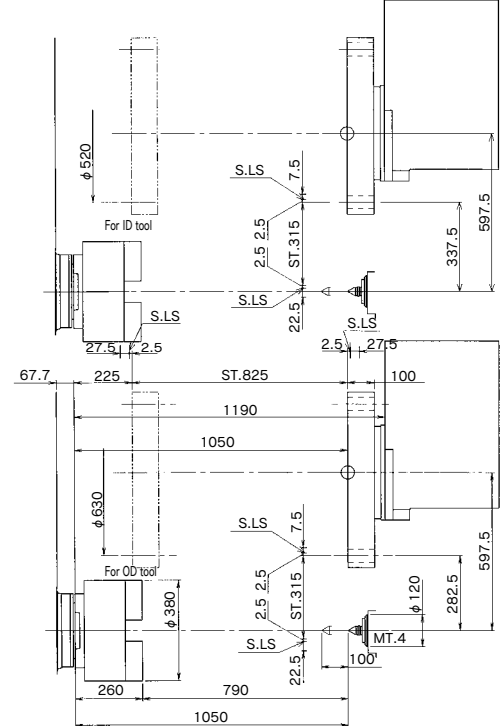


SC-450 VDI Turret

■ A specification/ 12stations /VDI



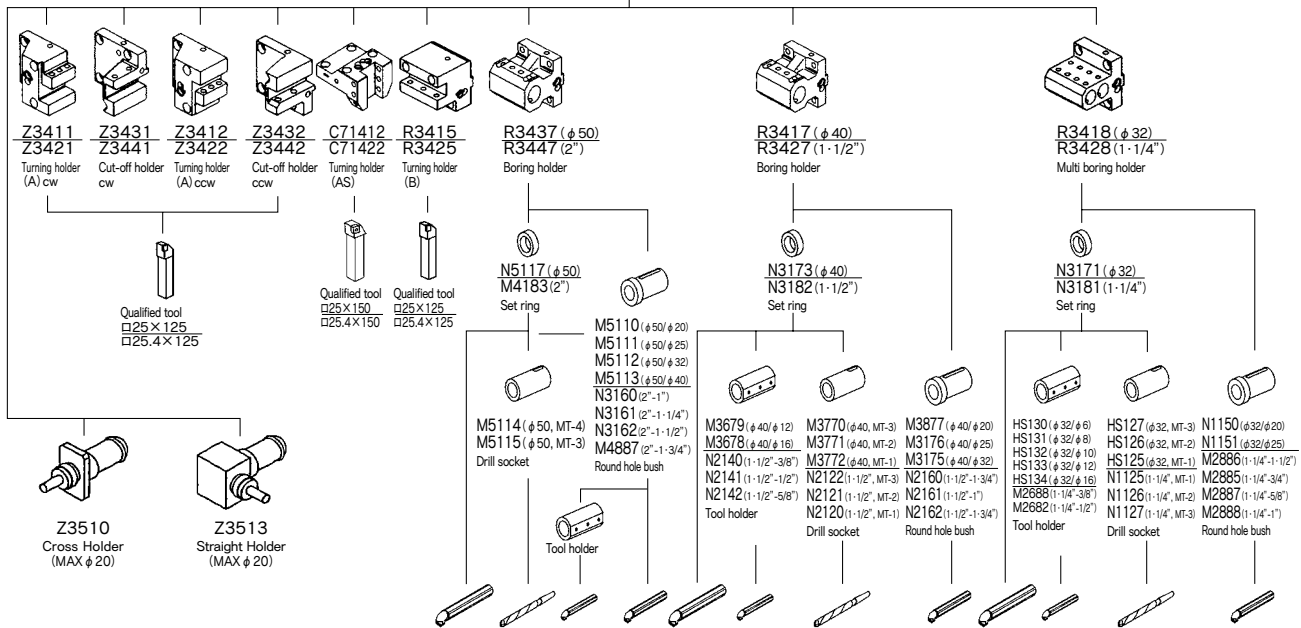
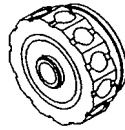
■ B specification/ 12stations /VDI



Tooling system diagram

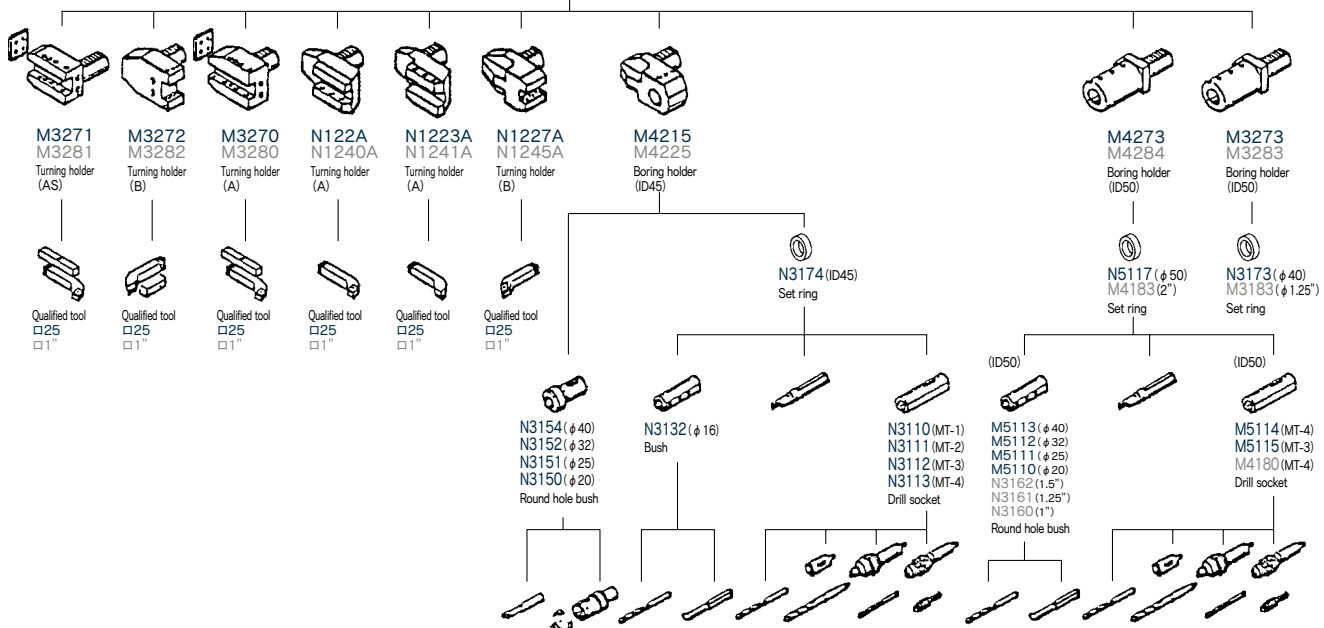
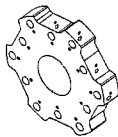
12st SC-450/450L

mm
inch



VDI turret SC-450

mm
inch



SC-450

Machine Specification

■ Capacity		
	type-A	type-B
Max. turning diameter	465mm	
Standard turning diameter	315mm	
Distance between centers	1050mm	
Max. turning length	785mm	715mm
Bar capacity	80mm	
Chuck size	12"/305mm	15"/380mm
■ Axis travel		
Slide travel (X)	315mm	
Slide travel (Z)	855mm (825mm for VDI)	
Slide travel (Y)	± 70mm (op.)	
Rapid feed (X)	12m/min	
Rapid feed (Z)	18m/min	
Rapid feed (Y)	6m/min (op.)	
■ Spindles		
Spindle speed	2500min ⁻¹	
Spindle speed range	Stepless	
Spindle nose	A2-8	
Hole through spindle	100mm	
I.D. of front bearing	140mm	
Hole through draw tube	82mm	
■ C-axis (op.)		
Least input increment	0.001°	
Least command increment	0.001°	
Rapid index speed	200min ⁻¹	
Cutting feed rate	1 - 4800° /min	
C-axis clamp	Disk clamp	
C-axis connecting time	1.5sec.	
■ Turret		
Type of turret head	Dodecagonal drum turret	
Number of Tool stations	12	
Number of indexing positions	12	
Tool size (square shank)	□ 25mm	
Tool size (round shank)	φ 50mm	
■ Driven tools (op.)		
Rotary system	Individual rotation	
Spindle speed	3600min ⁻¹	
Spindle speed range	Stepless	
Number of driven-tool stations	12	
Collet size	AR32	
Tool shank	Straight holder φ 1mm - φ 20mm Cross holder φ 1mm - φ 20mm	
■ Tailstock		
Quill diameter	120mm	
Quill taper	MT-4 (built-in center)	
Quill stroke	100mm	
■ Drive motor power		
Main spindle	30/22kW	
Driven-tool spindle (op.)	5.5/3.7kW	
■ General		
Machine height	2100mm	
Floor space	3865mmx1975mm	
Machine weight	5800kg	
■ Power supply		
Power supply	56.9kVA	

● Safety specifications

Various safety devices such as interlocks, safety fences for automatic loaders, and automatic fire extinguishers, are available as options, which can be included in your purchase package.

Please contact our local distributor or agent for your specific requirements.

● Precautions about the use of cutting coolant

Synthetic Coolants are Damaging to Machine Components

Concerning the use of cutting fluids, cautions have to be taken on the type of coolant being used.

Among coolants available in the market, some types are damaging to machine components and should be avoided. Typical damages are turcrite wear, peeling of paint, cracking and damage to plastics and polymers, expansion of rubber parts, corrosion and rust build up on aluminum and copper.

To prevent such damages, coolants that are synthetic, or containing chlorine have to be avoided.

Machine warranty terms do not apply to any claims or damage arising from the use of improper coolant.

Control Specification

■ Items	
Control type	FANUC 21i-TB
■ Controlled axes	
Controlled axes	2 axes
Simultaneously controlled axes	2 axes
■ Input command	
Least input increment	0.001mm/0.0001inch (X in diameter)
Least command increment	X : 0.0005mm, Z : 0.001mm
Max. programmable dimension	± 99999.999mm/ ± 9999.999in
Absolute / incremental programming	X, Z / U, W
Decimal input	standard
Program code	EIA/ISO automatic recognition
Inch / Metric conversion	G20/G21
Programmable data input	G10
■ Interpolation	
Positioning	G00
Linear interpolation	G01
Circular interpolation	G02/03, CW/CCW
Polar coordinate interpolation	standard for milling
Cylindrical interpolation	standard for milling
■ Feed function	
Cutting feed	X : 1 - 4800mm/min, 0.01 - 188inch/min Z : 1 - 4800mm/min, 0.01 - 188inch/min 0.0001 - 500.0000mm/rev 0.000001 - 9.999999inch/rev
Dwell	G04
Feed per minute / Feed per revolution	G98/G99
Thread cutting	G32+F
Thread cutting retract	standard
Hand feed Manual pulse generator	Manual pulse generator x 1 (0.001/0.01/0.1mm)
Automatic acceleration/ deceleration	standard
Linear acceleration/ deceleration after cutting feed interpolation	standard
Rapid feed override	F0/25/100%
Cutting feed-rate override	0 - 150%
Look ahead control	G08
■ Program memory	
Part program storage length	80m
Part program edit	Delete, insert, change
Program number search	standard
Sequence number search	standard
Address search	standard
Number of registerable programs	125programs
Program storage memory	Backed up by battery
Multiple program simultaneous editing	standard(not available during automatic operation of PC-G/GR)
DNC operation through memory card	standard (not including memory card)
Extended part program editing	standard
■ Program support	
Circular interpolation R programming	standard
Direct drawing dimension programming or Chamfering and Corner R	standard (Direct drawing dimension programming is standard setting)
Canned cycle	G90, G92, G94
Multiple repetitive canned cycle	G70 - G76
Multiple repetitive canned cycle II	standard
Canned cycle for drilling	G80 - G89
Sub program	standard
Programmable data input	G10
Custom macro B	standard
NT Work Navigator (torque type)	standard
NT NURSE	standard

SC-450L

Machine Specification

■ Capacity	
Swing over bed	810mm
Max. workpiece swing diameter	520mm
Max. turning diameter	480mm
Distance between centers	1752mm
Max. turning length	1520mm
Bar capacity	81mm
Chuck size	12"/305mm
■ Axis travel	
Slide travel (X)	322.5mm
Slide travel (Z)	1610mm (12 station Turret)
Slide travel (Y)	± 70mm (op.)
Rapid feed (X)	18m/min
Rapid feed (Z)	24m/min
Rapid feed (Y)	6m/min (op.)
■ Spindles	
Spindle speed	25 ~ 2500min ⁻¹
Spindle speed range	Stepless
Spindle nose	A2-8
Hole through spindle	100mm
I.D. of front bearing	140mm
Hole through draw tube	82mm
■ C-axis (op.)	
Least input increment	0.001°
Least command increment	0.001°
Rapid index speed	200min ⁻¹
Cutting feed rate	1 ~ 4800° /min
C-axis clamp	Disk clamp
C-axis connecting time	1.5sec.
■ Turret	
Type of turret head	Dodecagonal drum turret
Number of Tool stations	12
Number of indexing positions	12
Tool size (square shank)	□ 25mm
Tool size (round shank)	φ 50mm
■ Driven tools (op.)	
Rotary system	Individual rotation
Spindle speed	3600min ⁻¹
Spindle speed range	Stepless
Number of driven-tool stations	12
Collet size	AR32
Tool shank	Straight holder φ 1mm ~ φ 20mm Cross holder φ 1mm ~ φ 20mm
■ Tailstock	
Drive system	NC servo drive system
Stroke	1490mm
Rapid speed	15000mm/min
Tailstock taper shank	MT-5 (Rotating center) (Built in center MT-4/MT-5 (op.))
Thrust adjustable range	2.5 ~ 6.5kN
■ Drive motor power	
Main spindle	30/22kW 856/627N · m
Driven-tool spindle (op.)	5.5/3.7kW
■ General	
Machine height	2184.9mm
Floor space	5050mmx2164.8mm
Machine weight	9000kg
■ Power supply	
Power supply	60.1kVA

Control Specification

■ Items	
Control type	FANUC 0i-TD
■ Controlled axes	
Controlled axes	2 axes: X,Z
Simultaneously controlled axes	2 axes
■ Input command	
Least input increment	0.001mm/0.0001in (X in diameter)
Least command increment	X : 0.0005mm, Z : 0.001mm
Max. programmable dimension	± 99999.999mm/ ± 39370.078inch
Absolute / incremental programming	X, Z / U, W
Decimal input	standard
Inch / Metric conversion	G20/G21
Programmable data input	G10
■ Interpolation	
Positioning	G00
Linear interpolation	G01
Circular interpolation	G02/03, CW/CCW
Polar coordinate interpolation	G12.1 is available as option when the machine is equipped with Milling
Cylindrical interpolation	G07.1 is available as option when the machine is equipped with Milling
■ Feed function	
Cutting feed	Feed mm/min. X-axis : 1 ~ 4800mm/min, 0.01 ~ 188in/min Feed mm/min. Z-axis : 1 ~ 4800mm/min, 0.01 ~ 188in/min Feed mm/rev 0.0001 ~ 500.0000mm/rev 0.000001 ~ 9.999999inch/rev
Dwell	G04
Feed per minute / Feed per revolution	G98/G99
Thread cutting	G32+F
Thread cutting retract	standard
Handle feed Manual pulse generator	Manual pulse generator x 1 (0.001/0.01/0.1mm)
Automatic acceleration/ deceleration	standard
Linear acceleration/ deceleration after cutting feed interpolation	standard
Rapid feed override	Low range/25/50/100%
Cutting feed-rate override	0 - 150%
Look ahead control	G08
■ Program memory	
Part program storage length	512Kbyte (1280m)
Part program edit	Delete, insert, change
Program number search	standard
Sequence number search	standard
Address search	standard
Number of registerable programs	400programs
Program storage memory	Backed up by battery
Multiple program simultaneous editing	standard
DNC operation through memory card	standard (not including memory card)
Extended part program editing	standard
■ Program support	
Circular interpolation R programming	standard
Direct drawing dimension programming or Chamfering / Corner R	standard
Canned cycle	G90, G92, G94
Multiple repetitive canned cycle	G70 ~ G76
Multiple repetitive canned cycle II	G71, G72
Canned cycle for drilling	G80 ~ G89
Sub program	standard
Help Function	standard
Custom macro	standard
NT Work Navigator (torque type)	standard
NT NURSE	standard
Z-axis Abnormal Load detection	standard

● Safety specifications

Various safety devices such as interlocks, safety fences for automatic loaders, and automatic fire extinguishers, are available as options, which can be included in your purchase package.

Please contact our local distributor or agent for your specific requirements.

● Precautions about the use of cutting coolant

Synthetic Coolants are Damaging to Machine Components

Concerning the use of cutting fluids, cautions have to be taken on the type of coolant being used.

Among coolants available in the market, some types are damaging to machine components and should be avoided. Typical damages are turcrite wear, peeling of paint, cracking and damage to plastics and polymers, expansion of rubber parts, corrosion and rust build up on aluminum and copper.

To prevent such damages, coolants that are synthetic, or containing chlorine have to be avoided.

Machine warranty terms do not apply to any claims or damage arising from the use of improper coolant.



SC-450



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