DTC Series Compact Machining Centers are designed for drill tap applications as well as full milling capabilities. These compact machines are designed from the ground up to shave cycle times through both high speed and accurate machining. The added capability of the large capacity (24) pocket tool changer allows for the DTC line to handle applications traditionally pushed off to a larger style machine.

The DTC Series Machines are equipped with a FANUC OiMF CNC Control. The standard control package includes the AICCII with 400 block look ahead as well as tool management. We also outfit the standard machines with both the automatic door and light curtain package to prep the machine for easy robotic integrated solutions.

Available with factory integrated rotary table and hydraulic clamping solutions. Fully tooled up solutions are also available upon review for a complete automated package.

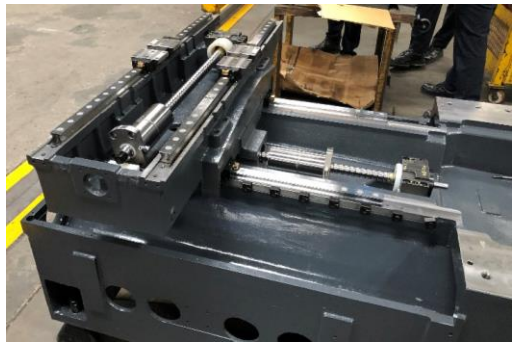
Equip your machine with a Factory Linear Pallet Change or Rotary Pallet Changer feature to further enhance the productivity gains.

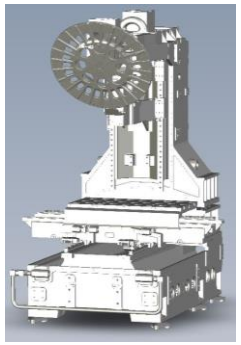
DTC Series Compact Machining Centers utilize cast iron components for the base and column. The cast iron base is FEM analyzed to absorb torsional and flexural forces induced during machining.

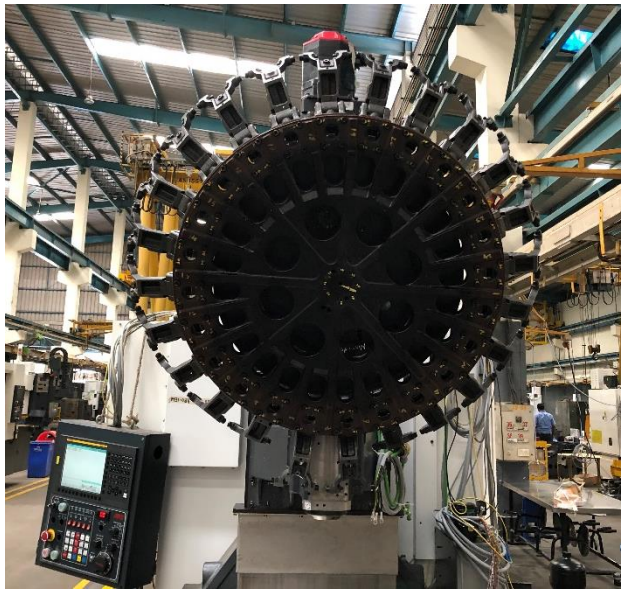
This machine structure is stress relieved prior to the primary machining process as well as after in order to retain the geometrical accuracies throughout the life of machine. This ensures high performance and reliable operation.

The column, spindle carriage & Z axes slide is mounted on the machine base. This machine base features two THK roller guideways. These guideways serve the cross slide (Y axis) carriage.

The base design creates favorable condition for easy disposal of chips and coolant through the pictured reliefs in the base casting.





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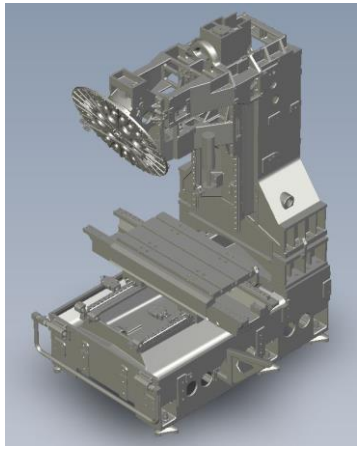
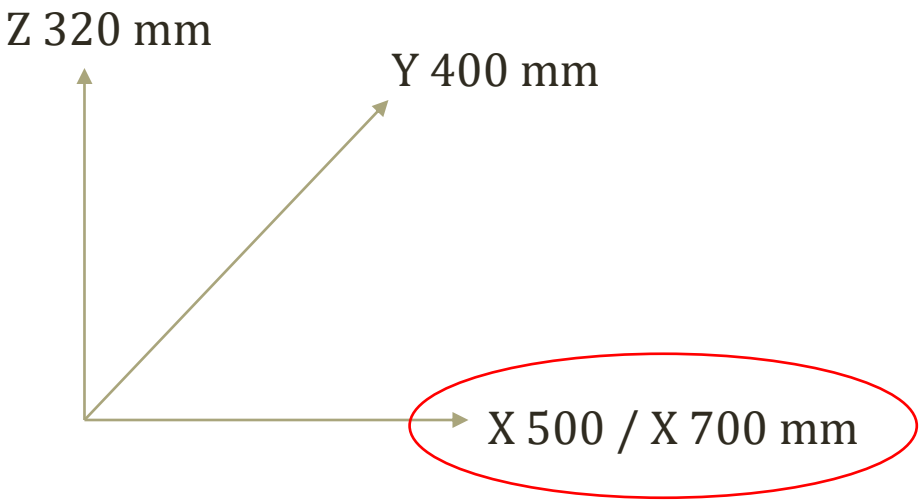


DTC Series Machine Range

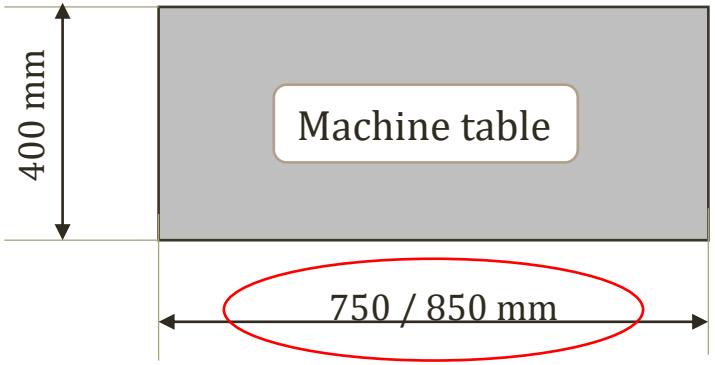
DTC-400 XL

DTC-400L-XL

Machine Strokes



Machine Table



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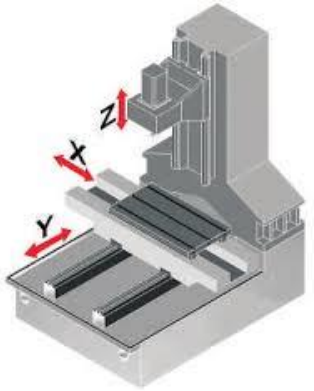
DTC400XL-L

High Speed Compact Machining Center:



- 33.4” x 15.7” Table
- 660lbs Table Load Capacity
- 27.5” x 15.7” x 12.6” XYZ Travels
- 5.12” Spindle Nose to Table Top
- 24 Pocket BBT30 Disc ATC
- 7.8” Maximum Tool Length
- 1,968ipm rapid traverse rate
- 1.35G Y-Axis Acceleration
- 1G X & Z Axis Acceleration
- FANUC OiMF with Fine Mold Package
- 4,400lbs Machine Weight
- 25KVA: 220V +/- 10% 60Hz 3 Phase

JTEKT
Koyo TOYODA

Faster ATC & Positioning

Lower Chip to Chip time
1.5 Seconds

Tool to Tool time
1.1 sec

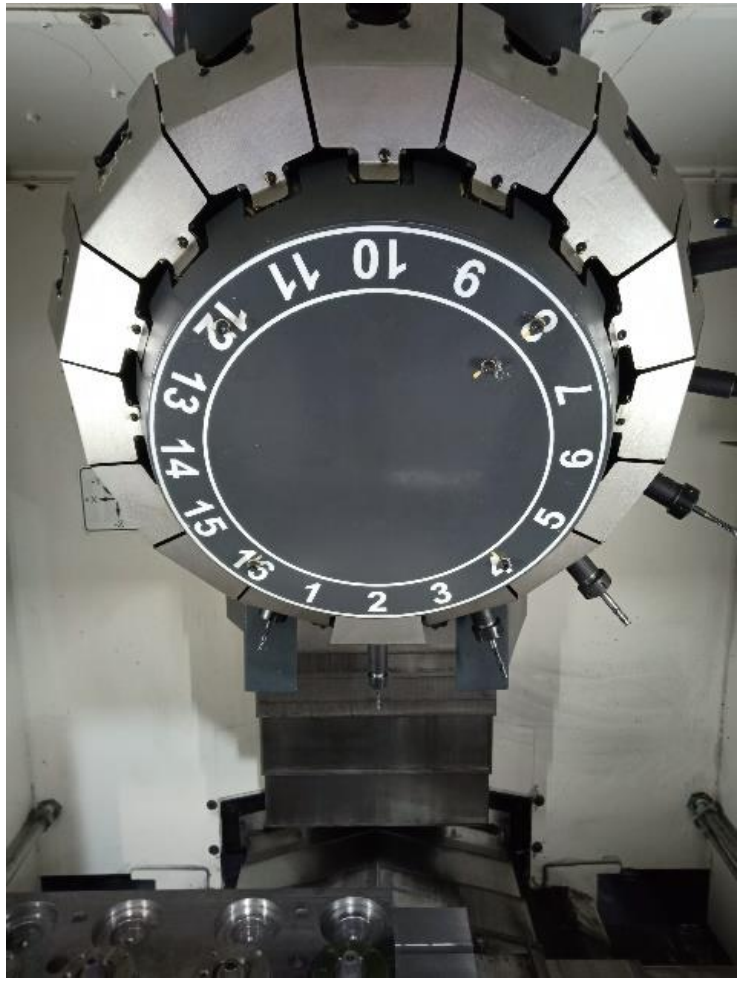
High Rapids (m/min)
DTC-400 XL - 60/60/48
DTC-400L-XL – 50/50/48

Pocket Tilting
16 STD / 24 OPT.
Fast
Reliable
Easy to Access
Servo Driven ATC

Spindle Taper
BT-30 / BBT-30
Dynamic
High Precision Bearings

High Acceleration
Z: 1.35 G (DTC)

Higher Spindle Speed
Std. 12000 RPM
Opt. 20000 RPM



High Speed & Rigid Spindles

Wide Variety of High Speed & High Power spindle Excellent ability in milling, drilling & tapping

BBT-30 → **Bearing Dia: 50 / 40 mm** → **Spindle speed: 10000 RPM 12000 RPM 20000 RPM**

Characteristics:

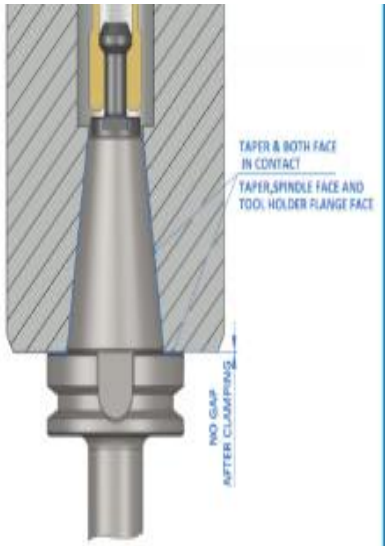
a) The spindle is supported on precise angular contact ball bearings, Grease lubricated for life

b) Cartridge type spindle design ensures **high rigidity and accuracy, easy to maintain**.

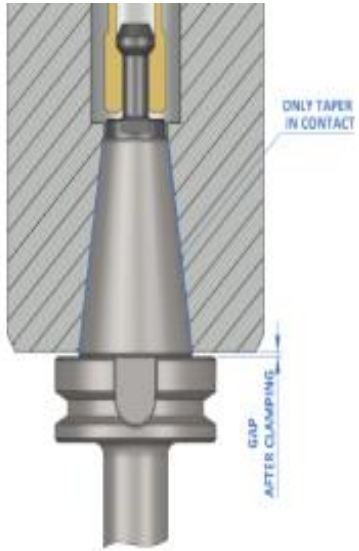
c) Designed for Drill & tap machining as well as for demanding metal removal by milling, Designed to take both axial and radial forces.

d) Spindle balanced to vibration free rotation.

e) Taper as well as face contacting simultaneously in BBT-30



BBT-30



BT-30

Heavy Machining & High Speed machining

Bi6/12K Spindle Motor

High Torque Spindle
Max. Speed 10000 RPM

Spindle Power:
7.5/5.5 kW

Base Speed – 2000 RPM
Torque (Cont) – 26.3 Nm
Torque (25%) – 47.8 Nm

Spindle Acceleration / Deceleration time in sec	
Max RPM	10000
Sec	1.4 / 1.3

Tapping Speed – 3000 RPM*

αi2/αT2/20K Spindle Motor

High Acceleration Spindle
Max. Speed 20000 RPM

Spindle Power:
9/7.5/6 kW

Base Speed – 5000 RPM
Torque (Cont) – 11.5 Nm
Torque (40%) – 17.5 Nm
Torque (25%) – 28.7 Nm

Spindle Acceleration / Deceleration time in sec	
Max RPM	20000
Sec	2 / 1.6

Tapping Speed – 5000 RPM*

αT3/12K Spindle Motor

High Torque Spindle
Max. Speed 12000 RPM

Spindle Power:
7.5/5.5/3.7 kW

Base Speed – 1500 RPM
Torque (Cont) – 22 Nm
Torque (60%) – 37 Nm
Torque (25%) – 48 Nm

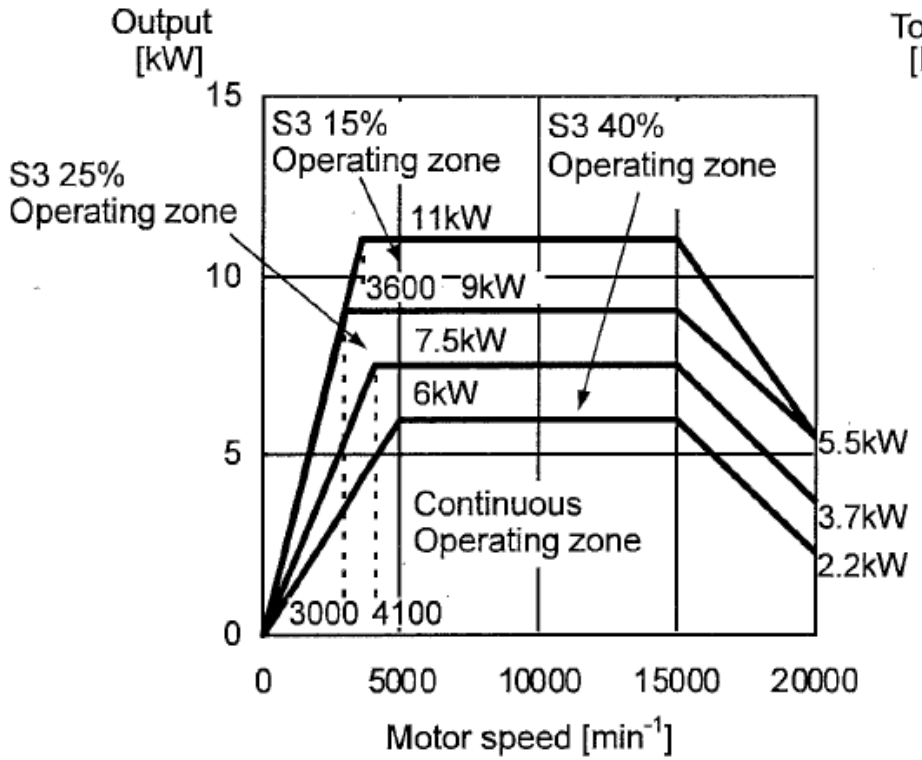
Spindle Acceleration / Deceleration time in sec	
Max RPM	10000
Sec	1.4 / 1.3

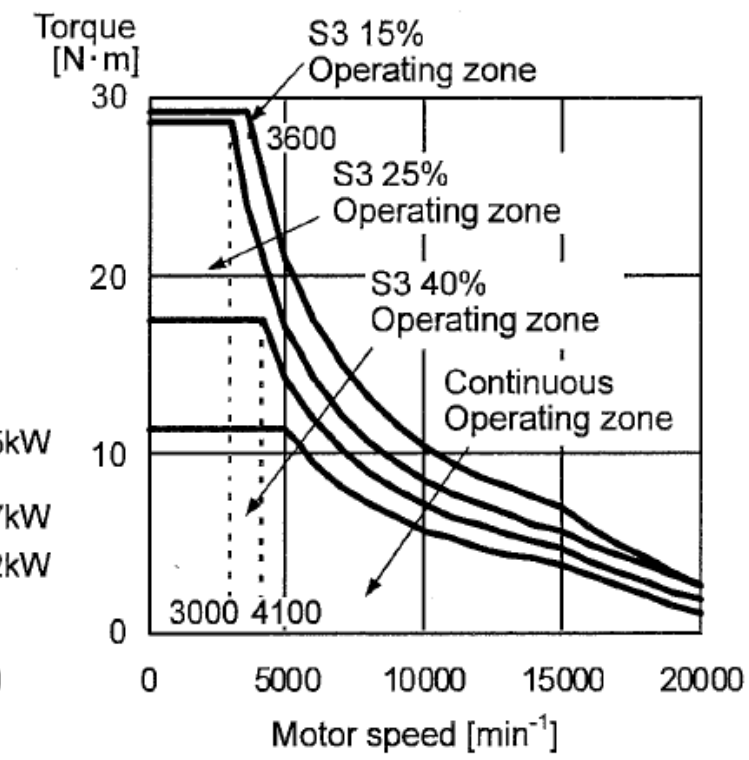
Tapping Speed – 3000 RPM*

Power Torque Diagram

Spindle Power – 9/7.5/6 Kw

αT2/20K motor -With CTS Opt.



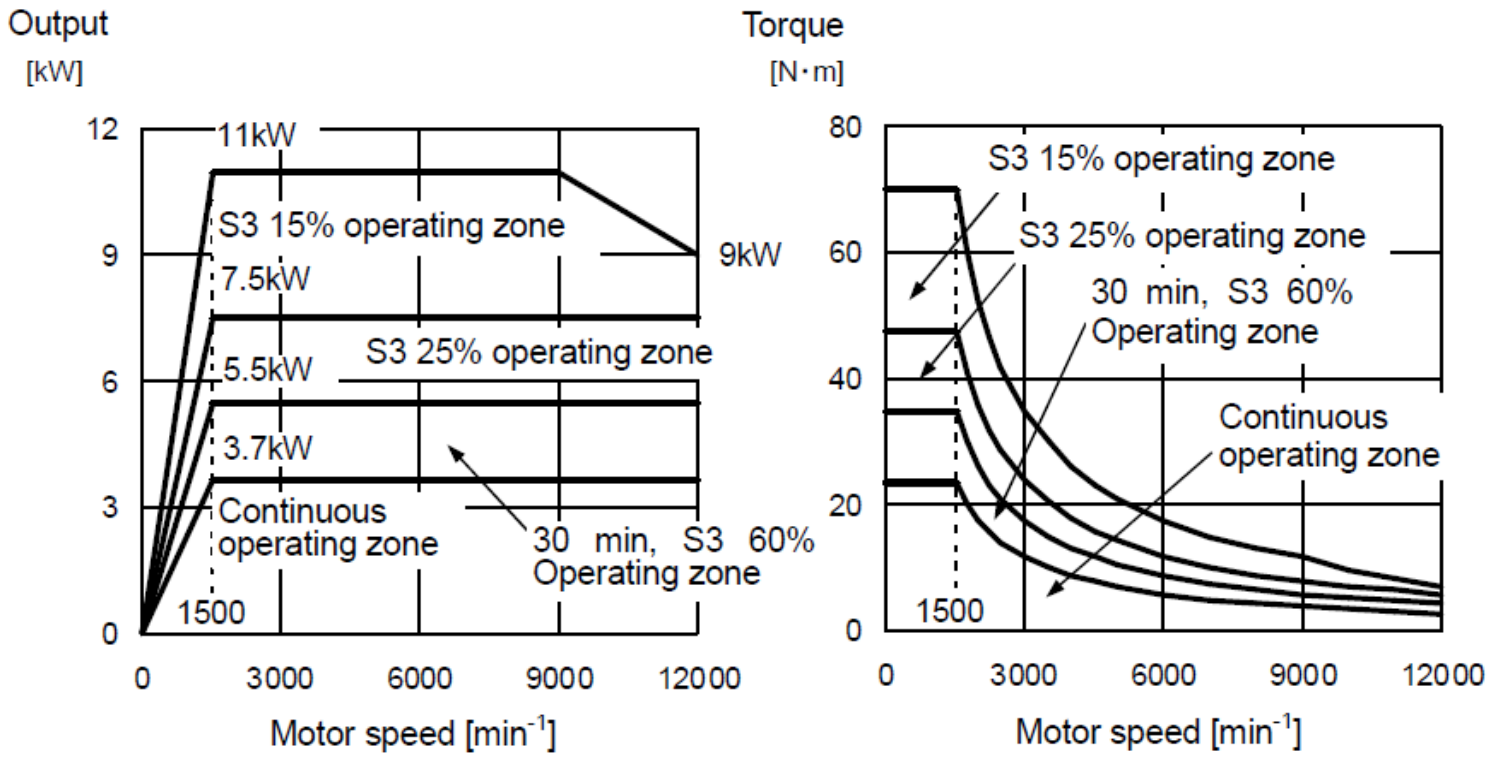


Base speed	**Torque (25% / 40% / Cont.)**
5000 rpm	28.7/17.5/11.5 Nm.

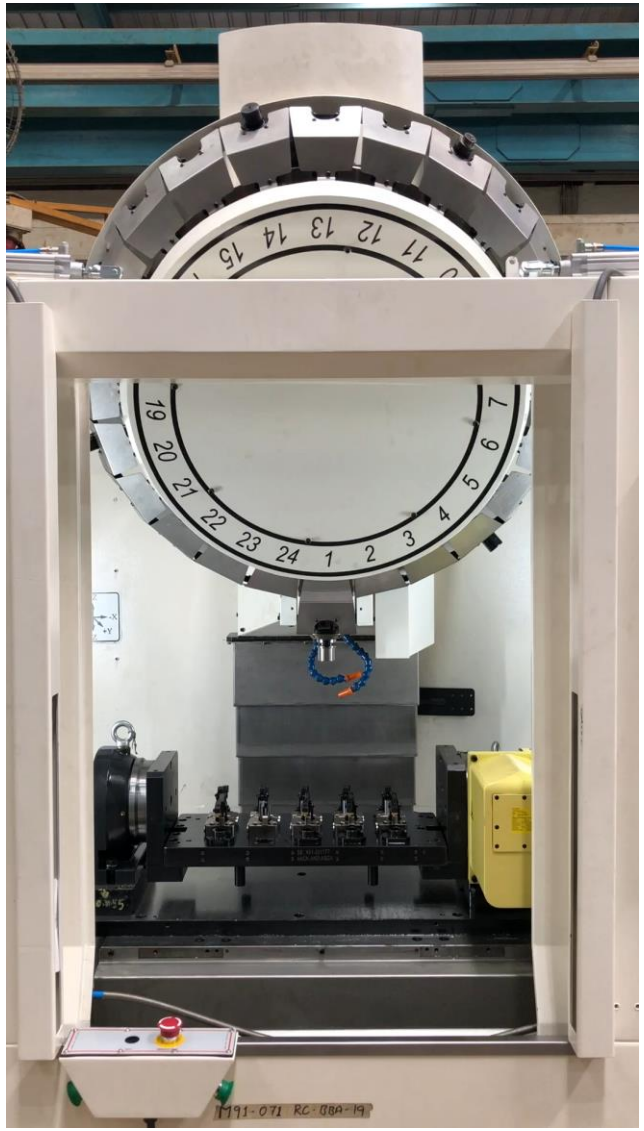
Power Torque Diagram

Spindle Power – 7.5/5.5/3.7 Kw

αT3/12K motor -With CTS Opt.



Base speed	Torque (25% / 60% / Cont.)
1500 rpm	22/37/48 Nm.




AMS
DTC 400XL-L


AMS

DTC400XL Standard Control Package

FANUC OIMF - 10.4” Screen

FANUC Fine Mold Package

- 400 Block Look Ahead
- Jerk Control
- AI Contour Control II
- Smooth Tolerance Control
- Machining Quality Level Adjust

FANUC Tool Life Management

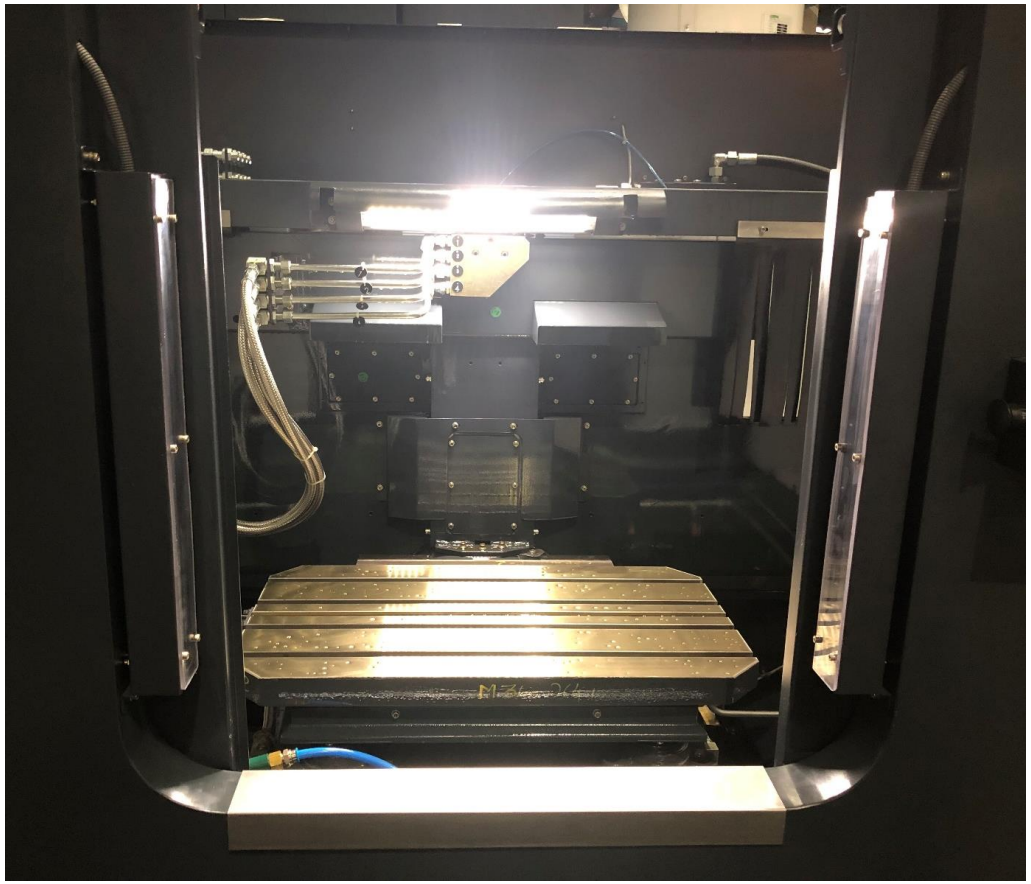
Built in 110v Power Outlet on Control

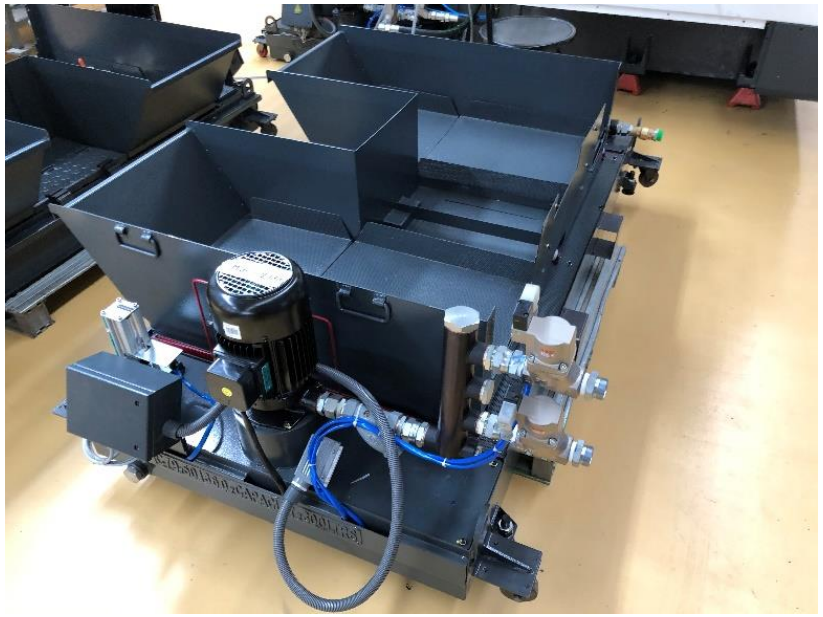
Manual Pulse Generator

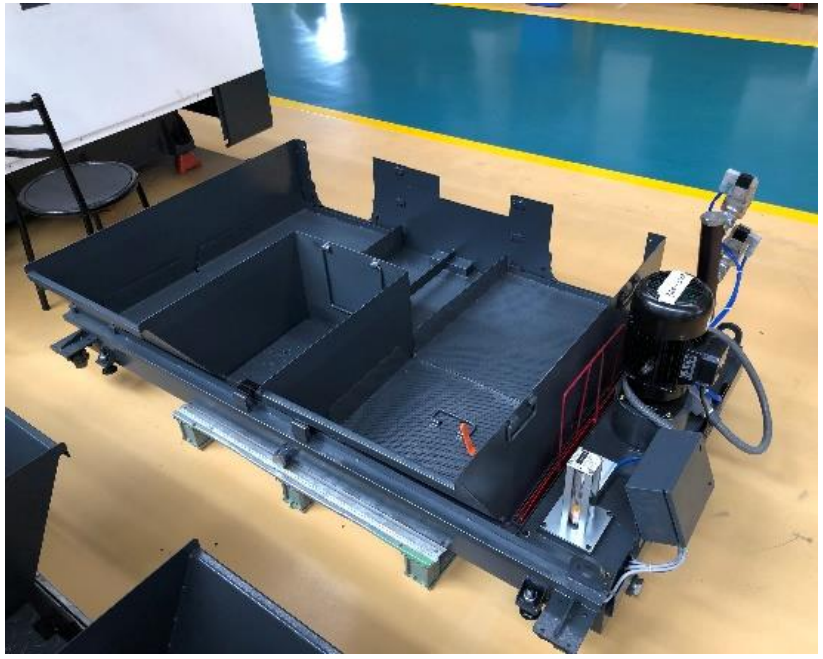
Front Auto Doors w/ Control Box
Factory Integrated Omron Light Curtains

Available with a Rotary Pallet Changer

Optional Hydraulic Prep Package Pictured Below







Productivity Enhancers (Optional)

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Hydraulic Power packs

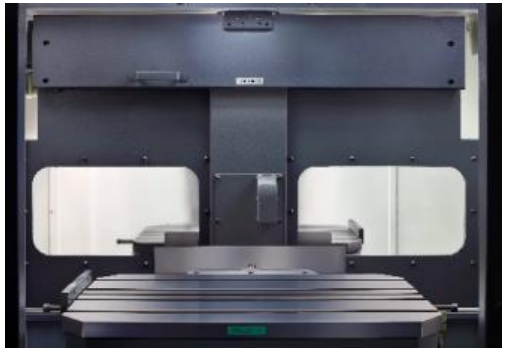
Application:
- Required for Component clamping
- HPP is provided with drain oil cooler to control the oil temp.

Available Options:
- 2 / 4 station @ 45 bar pressure
- 4 station @ 70 bar pressure
- 4 station @ 150 bar pressure

Available option:
- **Rotary type** (Front APC)
- **Linear type** (Side APC)

Automatic Pallet Changers (DTC-400XL)

Advantages:
- Reduced unproductive time during machining
- Due to fixed pallet changing time productivity is not dependent on operator efficiency
- Multiple setups in two pallets can ensure complete operations on complicated components
- Ideal for multiple components



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Product Comparison of DTC-400L-XL

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		AMS	FANUC	BROTHER
Description		DTC-400L-XL	**αD14/21LiA5**	**S700X1**
Machine Capacity				
Travel X/Y/Z	mm	700/400/320	700/400/330	700/400/300
Table Size	mm x mm	850 x 400	850 X 410	800 x 400
Max. load on table	kgf	300	300	250
Spindle & Rapids				
Tool shank type		BBT-30	BT-30	BT-30
Spindle speed	rpm	10000 /20000 (DD)	10000 (DD)	16000 / 27000 (DD)
Rapid Traverse	m/min	50/50/48	54 / 54 / 54	50 / 50 / 56
Automatic Tool changers				
Number of tools		16 / 24	14 / 21	14 / 21
Chip to chip time (β /α)	sec	1.5	1.4 / 1.6	1.4
Spindle power	kW	5.5/7.5 6/7.5/9 3.7/5.5/7.5	11 (1min) / 3.7	10.1 / 6.7
CNC control		FANUC 0iMF	FANUC 31i B5	
Floor Space				
Width x Depth	mm	2100 x 2700	2115 x 2040	2050 x 2220
Height	mm	2700	2236	2497
Weight	kgf	3600	2100	2400

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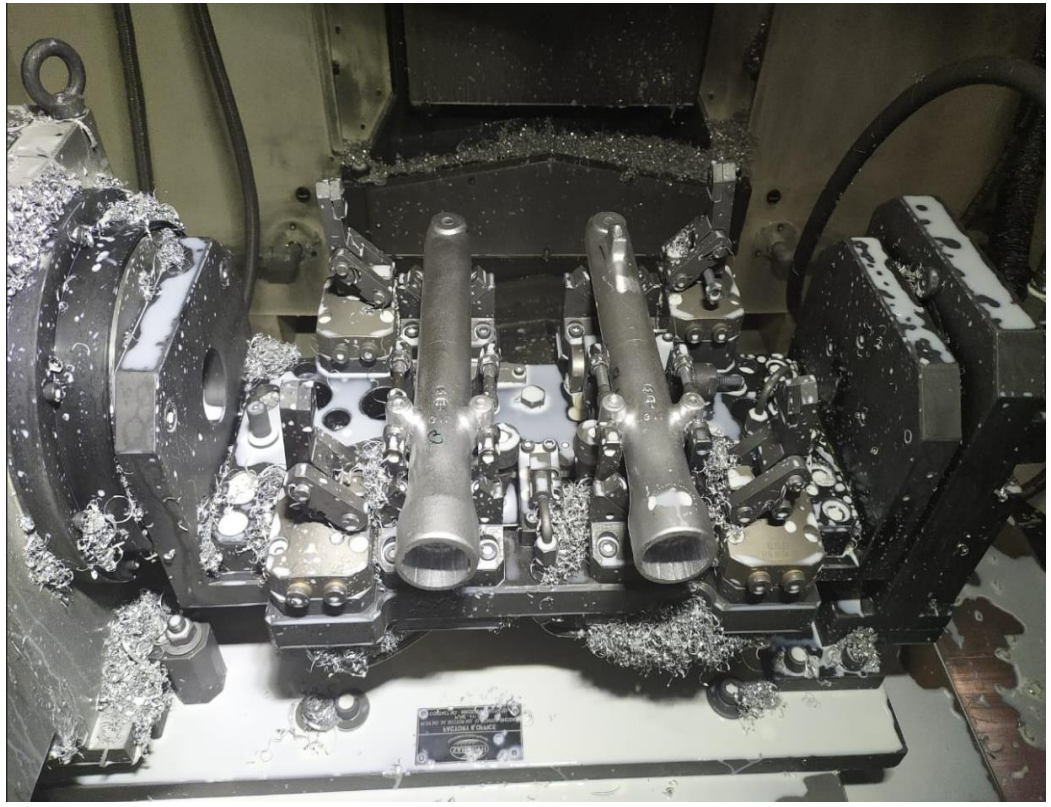
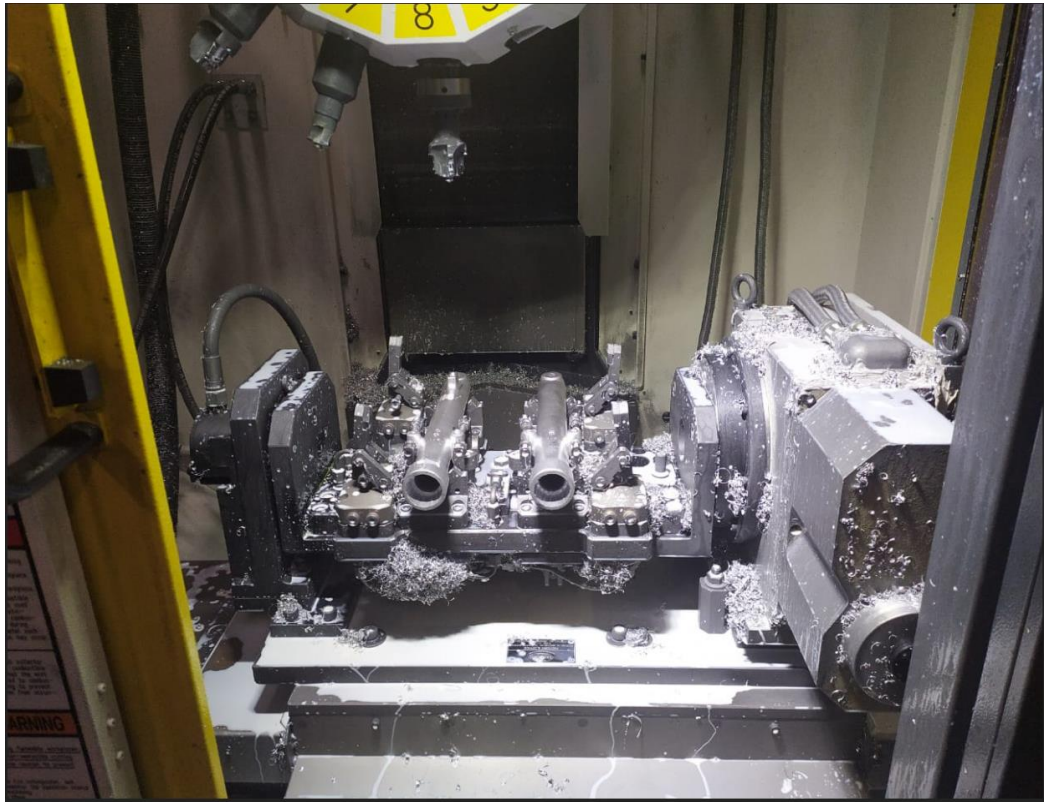
Group Company

Case Study

- **Component**: Outer tube
- **Material**: Aluminum Alloy
- **User of** : FANUC Robo Drill
- **Volume required**: 50,000/Month
- **Present cycle time on FRD:** 55 Sec/comp





Product Comparison & Application Details

	AMS	FANUC
Description	**DTC-400-XL-L**	**αD14MiB**
Machine No:	**M91-076**	
Table Size	850 x 410	650 X 400
Travel X/Y/Z	700/400/320	500/400/330
Max. load on table	300	200
Tool shank type	BT-30	BT-30
Spindle speed	10000 (DD)	10000 (DD)
Rapid Traverse	50/50/48	48/48/48
Number of tools	16T	14T
Chip to chip time	1.9	1.4
Spindle Motor	β6/12000	α12/10000
Spindle power	7.5 / 5.5	11 (1min) / 3.7
Application details		
Component	Outer Tube	Outer Tube
Material	Aluminum	Aluminum
No. of components	2 Comps	2 Comps
Cycle time achieved	**113 Sec / 2 comp.**	**110 Sec/ 2 comp.**
	(56.5 Sec/comp)	**(55 Sec/comp)**
Type of Fixture	Hydraulic (cradle)	Hydraulic (cradle)
No. of tools	8	8

Cutting Parameters

		AMS (DTC-400XL-L)		FRD (α-D14MiB)	
Sl No.	Tool Description	RPM	FEED	RPM	FEED
1	Ø32 MILLING CUTTER	8000	4000	8000	4000
2	Ø10.1 DRILLING	5000	1300	5000	1300
3	Ø7.35 DRILLING	5500	1100	5500	1100
4	M8	1700	2125	1700	2125
5	Ø14/8 DRILL	3200	400	3200	350
6	ROUGH BORE	3000	500	3000	500
7	Ø32 GROOVING	2800	1200	2800	1200
8	Ø42 FINISH BORE	3100	600	3100	600
		CT	**60**	**CT**	**62**
		IT	**53**	**IT**	**48**

CONCLUSION:

- ✓ Initial cycle time clocked with 142 Sec & reduced to 113 sec. on DTC-400XL-L machine.
- ✓ Simultaneously position the X/Y-and additional axes while performing a tool change, leading to further reduction of Idle time.
- ✓ Cutting time is lesser than FRD (i.e. 60sec in place of 62 sec.)
- ✓ Idle time is higher than FRD (i.e. 53 sec in place of 48 sec).
- ✓ So, total cycle time difference of 3 sec more compared to FRD.

Further consideration of reduction in idle time with implementation of below points we can reduce by approx. 5sec.

- ✓ Index time for tool change from last tool to first tool i.e. (T9-T1) = 0.225X8 = 1.8 Sec.
- ✓ Chip to chip time between FRD & AMS i.e. 1.9-1.4 = 0.5x8T = 4sec.
- ✓ Spindle acc/deacc, orientation might be better in FRD.
- ✓ So, difference will be aprrox. 5 sec.

Target Work pieces

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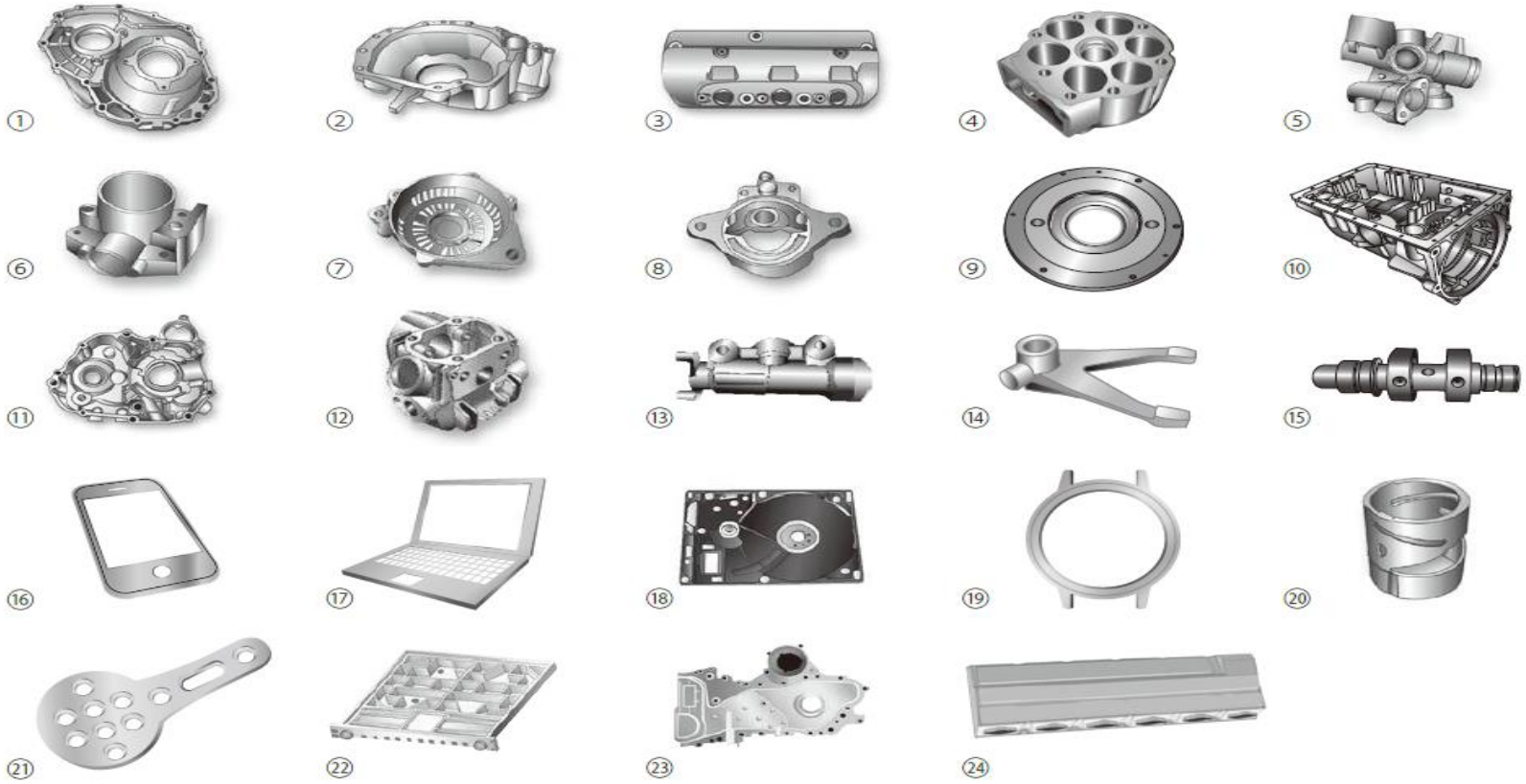

■Automotive and motorcycle parts

①CVT intermediate housing
②Clutch case
③Cylinder head cover
④Cylinder block
⑤EPS housing
⑥Throttle body
⑦Alternator
⑧Starter housing
⑨Flywheel
⑩AT transmission case
⑪Crankcase
⑫Cylinder head
⑬Brake master cylinder
⑭Shiftfork
⑮Camshaft

■IT and general machinery parts

⑯Mobile phone
⑰Personal computer case
⑱HDD parts
⑲Watch parts
⑳Camera parts
㉑Medical implants

■Large parts

㉒Relay box
㉓Timing chain cover
㉔Cylinder head cover for trucks

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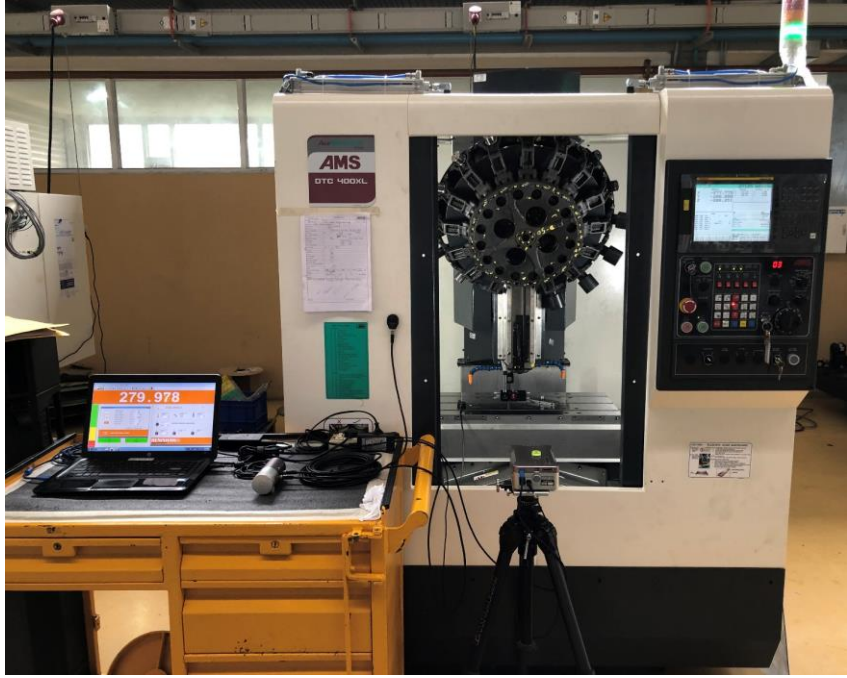
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DTC 400XL
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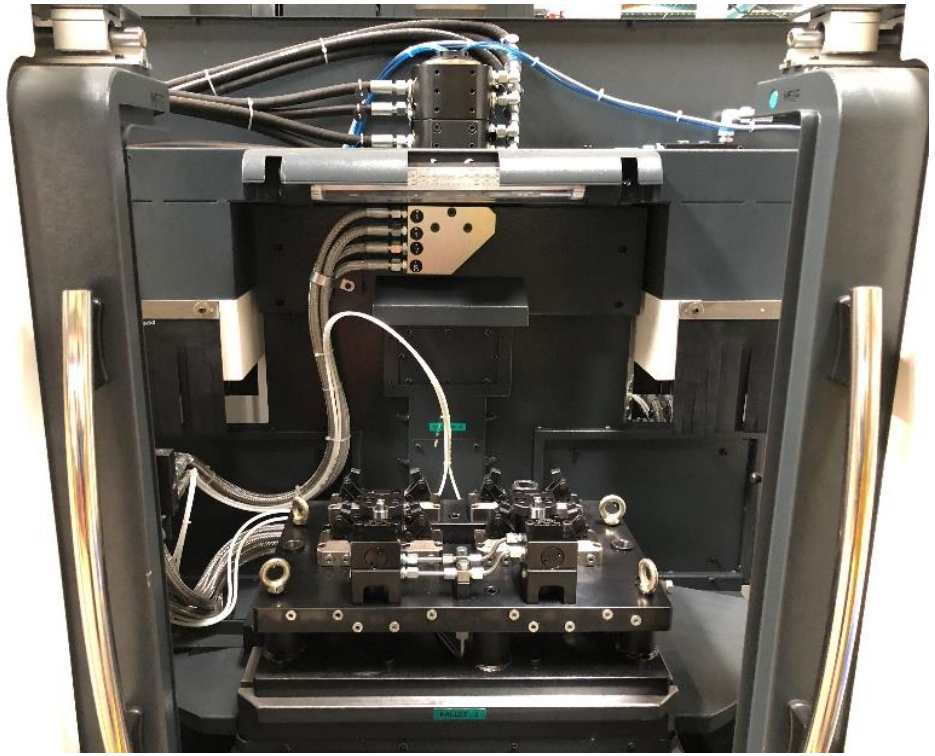


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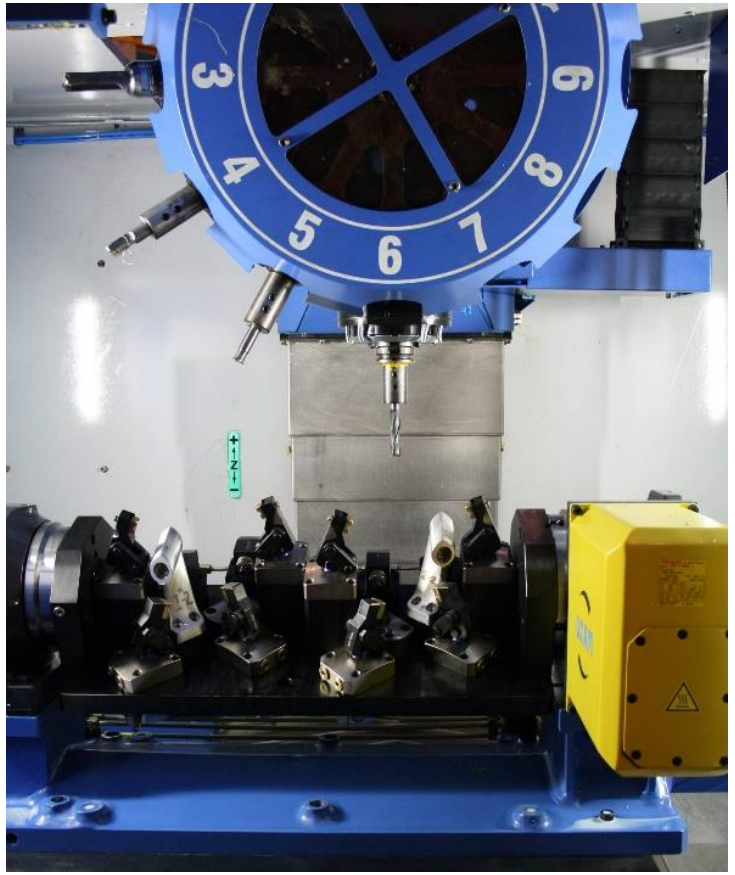
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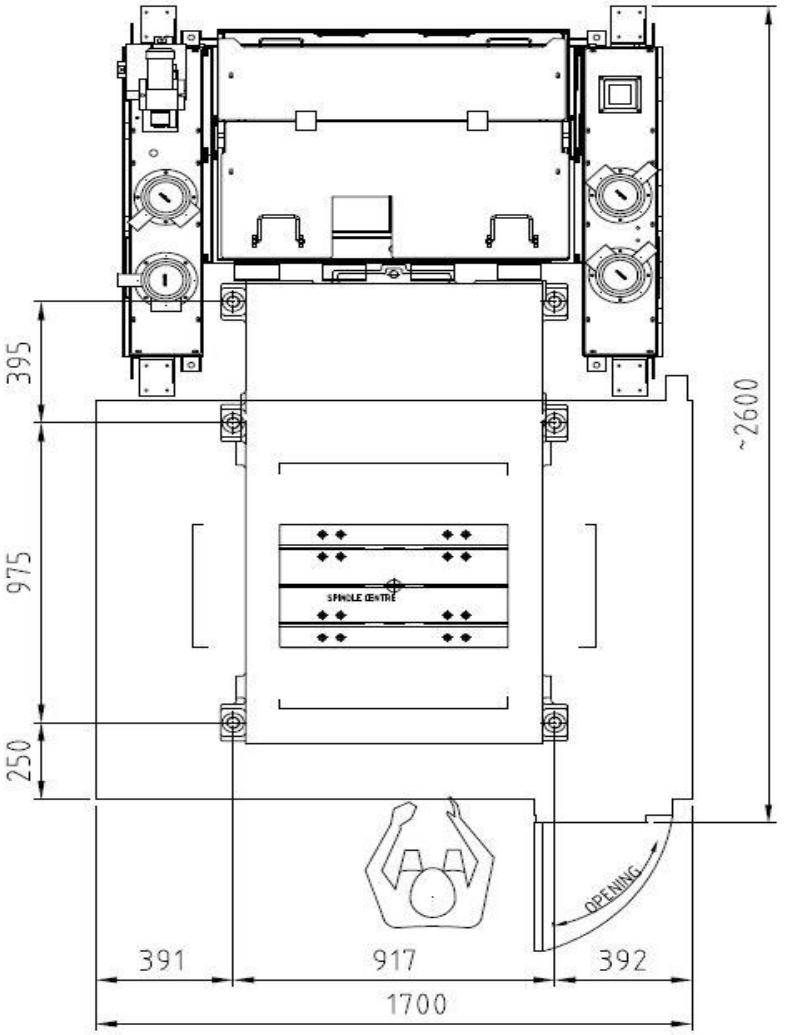
DTC400XL-L – Toyoda Stock Package Detailed List

Stock Machine Package:

- FANUC OIMF w/ 10.4” Screen
- 20,000 RPM 10HP BBT30 Spindle
- Front Auto Door with Omron Light Curtains
- 24 Pocket Servo Driven Disc Style ATC
- Nikken CNCZ 180LFA Table w/ TAT Support
- High Pressure 725PSI Coolant Through Spindle
- Machine Mount Losma Galileo Mist Collector
- Wexten Spindle Chiller Unit with Flow Switch
- FANUC Fine Mold Package with 400 Block Look Ahead
- FANUC Tool Life Management
- Machine Work Light – APC and Machine Envelope
- Electrical Control Panel Air Conditioner
- Coolant Gun at Pallet Changer Stand
- Machine CE Marking



AMS
Production Line