

**54016** a 3 Axes CNC Vertical Machining Centre with FANUC / Siemens / Mitsubishi Control and with option of 20 Station Automatic Tool Changer. Optional 4th axis capability

- 54016 is a smart CNC vertical milling machine designed specifically for industrial specifications.
- It is a precision milling machine totally enclosed high visibility sliding guard.
- It uses industrial controls such as FANUC, Siemens, Mitsubishi
- The machine is provided with widely placed precision LM guide ways for increased rigidity and high accuracy
- The castings are internally reinforced with heavy ribs to resist flex and damp vibrations.
- The machine is equipped with cartridge type spindle power with 20 tool arm type



### Objective

Interpret the components, concept of intermittent level industrial machine and learn about the advanced Fanuc Syntec controller handling & programming skills for a milling machine to produce different kinds of components with optimized cycles and execute different kinds of practical applications simulated as exercises.

### Learning Objectives:

Having successfully completed this lab, the student will demonstrate knowledge in –

- Learn about techniques to optimize the cutting parameters
- Advanced programming techniques matching industrial standards.
- Advanced machining cycles & control techniques.
- Knowledge on centralized Lubrication and re-circulating coolant system
- Learn about Intricate Tool changers system.
- Maintenance of CNC machineries and Trouble shooting

### SPECIFICATIONS

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<b>Travel</b>		
X axis	mm	480
y axis	mm	360
Z axis	mm	500
<b>Table</b>		
Table size	mm	700 x 420
T- Slot (No. x width x pitch)	mm	3 x 14 x 100/ Depth 25
Load on table	Kgs	300/ 350
<b>Spindle</b>		
Spindle		Direct coupled, Cartridge Type
Spindle nose to table top	mm	80-580
Spindle to Column	mm	480
Spindle nose taper		BT 40
"Spindle output 15 min output (Continuous)"	Kw	"7.5 (5.5); 5.5 (3.7)"
Programmable spindle speed	rpm	100-8000
<b>CNC detail</b>		
Control system		"FANUC 0i MF; Siemens 828D Mitsubishi control option available"
Programmable feed rate	mm/min	0 - 10000
Rapid feed X/Y/Z	mm/min	30000/30000/20000
Positioning accuracy	mm	0.01
Repeatability	mm	±0.005
Axis motor		AC Servo motor
Guideways		Linear motion guide ways Size 35
Ball screws X/Y/Z	mm	32mm & 10mm C3 Class

Note: Specifications are subject to change.

### Tesca Technologies Pvt. Ltd.

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<b>Power source</b>		
Power Required	KVA	24
Main supply		415V, 3 Ph., 50 Hz
<b>Coolant / Lubrication</b>		
Coolant Capacity	ltrs	180/ 25 LPM
Coolant motor	Kw	0.37 for coolant; 0.74 for flush coolant
Lubrication		Automatic lubrication system
<b>Machine dimensions</b>		
L x W x H	mm	2100 x 2650 x 2680
Weight (approx)	Kgs	4100
<b>Standard operations and maintenance tools</b>		
User Manual CD	No.	1
Allen Key (full Set)	Set	1
Double Ended Spanner 6-7,8-9,10-11,12-13,14x15,16-17,18-19,22-24,32-36	Set	1
Screwdriver (Full Set)	Set	1
Oilcan	Nos.	1
Brush 63mm	Nos.	1
Billets MS 100x100x25mm	Nos.	3
Control box Key	Nos.	1
MOP Key	Nos.	1
Ethernet Cable	Nos.	1
Vibration Pad with bolt	Nos.	5
Eye Bolt M24	Nos.	4
Mechanical Edge Finder(shank dia 10mm)	Nos.	1
Clamping Kit M12	Set	1
Tool Clamping Fixture BT40	Nos.	1
Tool Extractor	Nos.	1
E Type Spaner (E25, E32, E40)	Set	1
Flash Card 2GB	Nos.	1
Card Reader with Cable	Nos.	1
Touchup Paint (small can)	Nos.	1
Air Gun with 8mm Spiral hose and Connector	Set	1
<b>NOTE: Oil and coolant to be purchased locally by the user, as international shipment is being restricted by customs rules</b>		
<b>Optional Accessories</b>		
Compatibility / Upgradable		FMS / CIM system
Pneumatic Vice width 150 mm x opening 110 mm	No	1
Automatic Door		Pneumatic
<b>OPTIONAL AUTOMATIC TOOL CHANGER</b>		
Tool Shank		BT 40
No of Tool		20 tools Arm type
Actuation type		Motorized
Maximum tool dia	mm	80
Maximum tool length	mm	250
Max tool weight	kg	6
Tool change time	sec	1.4
Chip to Chip Change Time	sec	6.4
<b>OPTIONAL: 4th Axis Rotary Table</b>		
CNC Rotary Table Model		URH-201
Worktable diameter	mm	200
Center height (Vertical)	mm	140
Diameter of center through hole	mm	60

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T - Slot size	mm	12H8
Guide block size	mm	14H7
Indexing precision	sec	+/- 15
Repeatability	sec	4
Clamp torque	kg-m	25
Clamp method		5kg/cm2
<b>Load Capacity</b>		
Vertical	Kgs	150
Horizontal	Kgs	300
Vertical with Tail stock	Kgs	300
Allowable turntable torque	Nm	250
Net weight (Motor exclude)	Kg	60
Servo motor (model excluded)		Varies with control
Speed reduction ratio		1:90
Minimum input increment	deg	0.001
Table rotation speed	rpm	33.33
<b>OPTIONAL 4th and 5th Axis Tilting Rotary Table</b>		
CNC Rotary Table Model		URH-2010-TNRP
Turntable diameter	mm	200
Swing	mm	200
Tilting Range	deg	-20 to +110
Center bore diameter	mm	60H7
T - Slot size	mm	8 x 12H8
Guide block size	mm	14H7
Indexing precision (Rotary axis)	sec	+/- 15
Indexing precision (Tiltingaxis)	sec	+/- 30
Repeatability	sec	4
Clamp torque@ 30 Bar	Nm 250 (Pneumatic)/ 500	
Hydraulic		
Clamp method		Pneumatic or
hydraulic		
<b>Load Capacity</b>		
Vertical	Kgs	45
Horizontal	Kgs	80
Driving Torque	Nm	250
Net weight (Motor exclude)	Kg	170
Servo motor (model excluded)		Varies with control
Speed reduction ratio (rotary, tilting)		1:90
Minimum input increment	deg	0.001
Table rotation speed (rotary, tilting)	rpm	33.33
<b>OPTIONAL: Standard Tool Package</b>		
"Collet Chuck Holder and Pullstud RD 25-BT40"	Nos.	2
"Collet Chuck Holder and Pullstud RD 32-BT40"	No.	1
Drill Chuck Holder and Pullstud BT40/JTA6	No.	1
End Mill Adapter with holder and Pullstud BT40 SHELL END MILL ADAPTOR 16MM	No.	1
Side Lock Holder BT30/ Dia 16 Side Lock Holder	No	1
"Drill Collet RD 25 COLLETS(7-6,9-8, 10-9mm), RD 32 COLLET (12-11)"	Set	1
Tap Collet(ISO) RD 25 ISO Tap collet suitable for M8, RD 32	Set	1
ISO Tap Collet suitable for M10		
"Cutter Tools HSS SHELL END MILL SHANK DIA.40MM, CUTTER WITH DIA.16MM BORE"	No.	1
Twist Drill Dia 6.8, 8.5, 11 mm	Set	1
Slot Drill Shank 12 mm	Set	1

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End Mill Shank 12 mm	set	1
CHAMFER CUTTER 45° Shank 10 mm	No.	1
CENTRE DRILL SHANK DIA. 8MM TIP DIA 2 MM	No.	1
Boring Bar with Insert Dia 12 mm	No.	1
Vice with Handle (110 mm opening)	Nos.	1
<b>OPTIONAL: SET OF STANDARD OPERATION AND MAINTENANCE SPARES FOR ONE YEAR</b>		
ACMCB, 3POLE ,415VAC, 32 A PTR103PB32	Nos.	1
MPCB 0.63-1 A GV2 -ME05	Nos.	3
CONTACTOR +24 VDC , COIL VG, WITH COIL SUPPRESSOR, 6A LP1KO6 10BD	Nos.	4
DCMCB , 1 POLE, 1A PTR1031DC01	Nos.	2
DCMCB , 1POLE, 4A PTR1031DC04	Nos.	1
DCMCB , 1POLE, 2A PTR1031DC02	Nos.	2
AC MCB ,1 POLE,4 A PTR101PC04	Nos.	1
ASF4(L) 2A,24VDC, WITH END PLATE	Nos.	5
AC MCB ,2 POLE,16 A PTR102PB16	Nos.	1
INTERFACE MODULE 50PIN FR-50	Nos.	1
50 PIN FRC FEMALE CONNECTOR WITH LOCK	Nos.	6
50 WAY FLAT CABLE(grey)	Meters	2
Mushroom head pushbutton latch type for Emergency with 1NO+1NC	Nos.	1
ILLUMINATED PUSH BUTTON 18X18 FLUSH TYPE, SQUARE 24VDC OPERATED GREEN with 1 NO D16LMS1abHG	Nos.	1
ILLUMINATED PUSH BUTTON 18X18 FLUSH TYPE, SQUARE 24VDC OPERATED RED with 1 NC D16LMS1abHR	Nos.	1
M5 INDUCTIVE SENSOR SPEC: PNP-NO SENSING DISTANCE 2MM	Nos.	1
M8 INDUCTIVE SENSOR SPEC: PNP-NO SENSING DISTANCE 2MM	Nos.	1
0.18 SQMM 6 PAIR TWISTED PAIR CABLE (10 CORE) SHIELDED OUTSIDE DIA OF THE CABLE : 6 MM	Mts.	1
0.5 SQMM 2 CORE CABLE	Meters	5
Work light with inbuilt choke smc fluorescent 11w/24vdc LAMPS : 1x11 W PL-L	Nos.	2
24V DC power supply Input : 85-285 VAC Output: 24VDC, 4.2 A DIN RAIL MOUNTING TYPE	Nos.	1
<b>REQUIRED EQUIPMENT AT SITE AND UTILITIES TO BE PROVIDED BY THE BUYER DURING COMMISSIONING, DEMONSTRATION &amp; TRAINING</b>		
Servo Stabilizer 24 KVA,3 Phase – 1 no.		
Compressor - 100 Litre tank Capacity, 6 to 8 Bar (100 – psi) – 1 no. (for ATC Operation)		

#### Training Skills –

- Identification of the Components of the CNC System
- User friendly and graphically assisted different canned cycles
- Discussion on Programming Elements
- Discussion on Industry Standard ISO G and M Codes
- Discussion on Various Tools to be used in a CNC Milling Operation
- Study on Process Planning
- Discussion on Program Zero and Offset definition
- Cutter Radius Compensation and Tool Length Compensation Definition
- Preparation of CNC Programs using CNC Milling Machines
- Discussion on Various Machining Cycles used in CNC Milling Programming
- General machine Maintenance

**Note:** As part of continuous improvement, Tesca reserves the right to alter machine design and specification without prior notice.

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**Ordering Details**

<b>SN.</b>	<b>Order Code</b>	<b>Details</b>
1.	54016	<b>Included in the package:</b> CNC Vertical Machining Center (700 x 420 mm table, 5.5 Kw Spindle) Control Option: Siemens 828D or Fanuc Oi TF or Equivalent
2.	54016A	<b>20 Tool ATC (Arm Type)</b>
3.	54016B	<b>Tooling Package Bt40</b>
4.	54016C	<b>4th axis Drive Ready with rotary table</b>
5.	54016D	<b>4th and 5th axis Drive Ready with rotary table</b>
6.	54016E	<b>Export Packing</b>
7.	54016F	<b>OPTION Automatic Door</b>

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