VictorTaichung

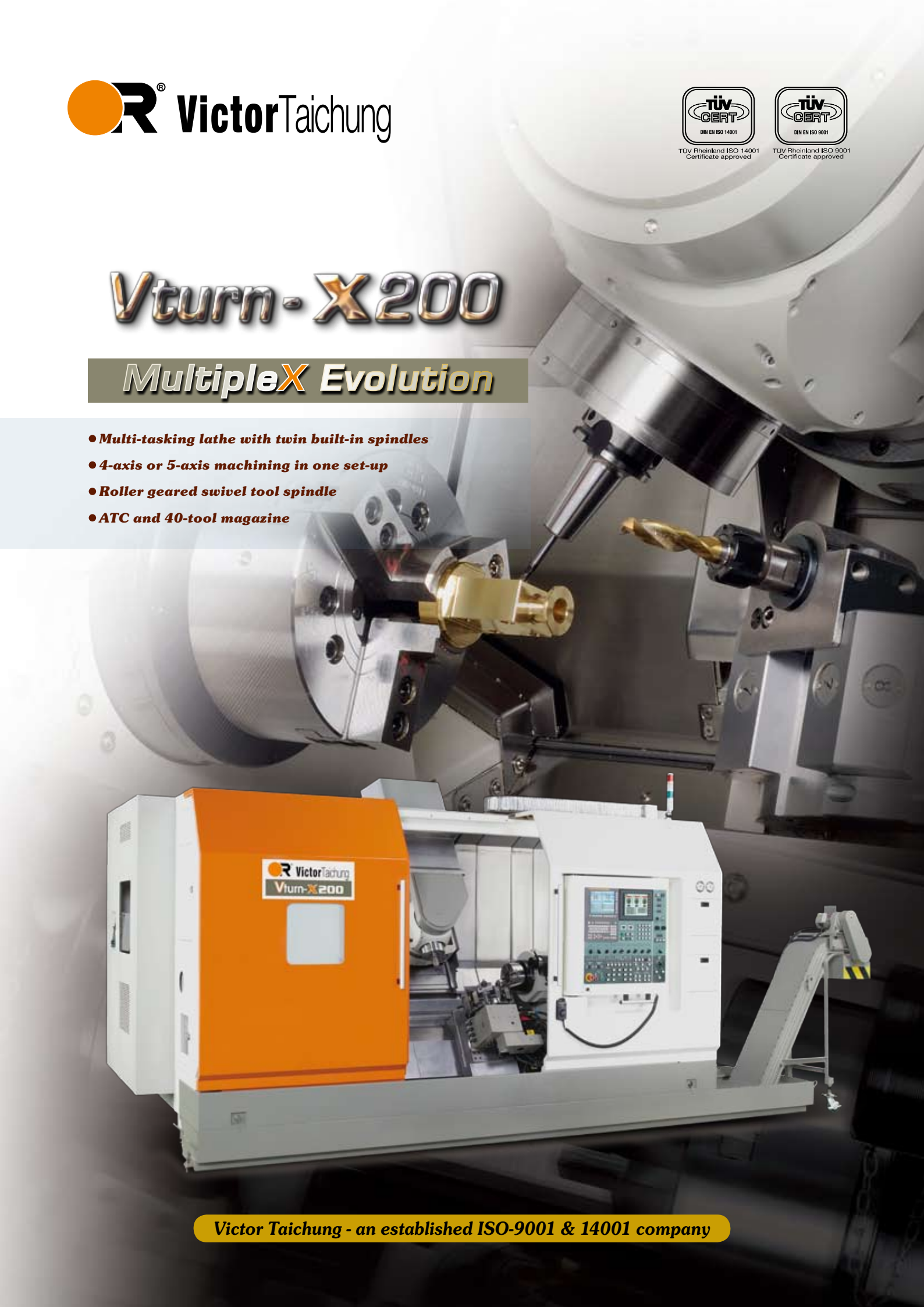
TÜV Rheinland ISO 14001 Certificate approved

TÜV Rheinland ISO 9001 Certificate approved

Vturn-X200

MultipleX Evolution

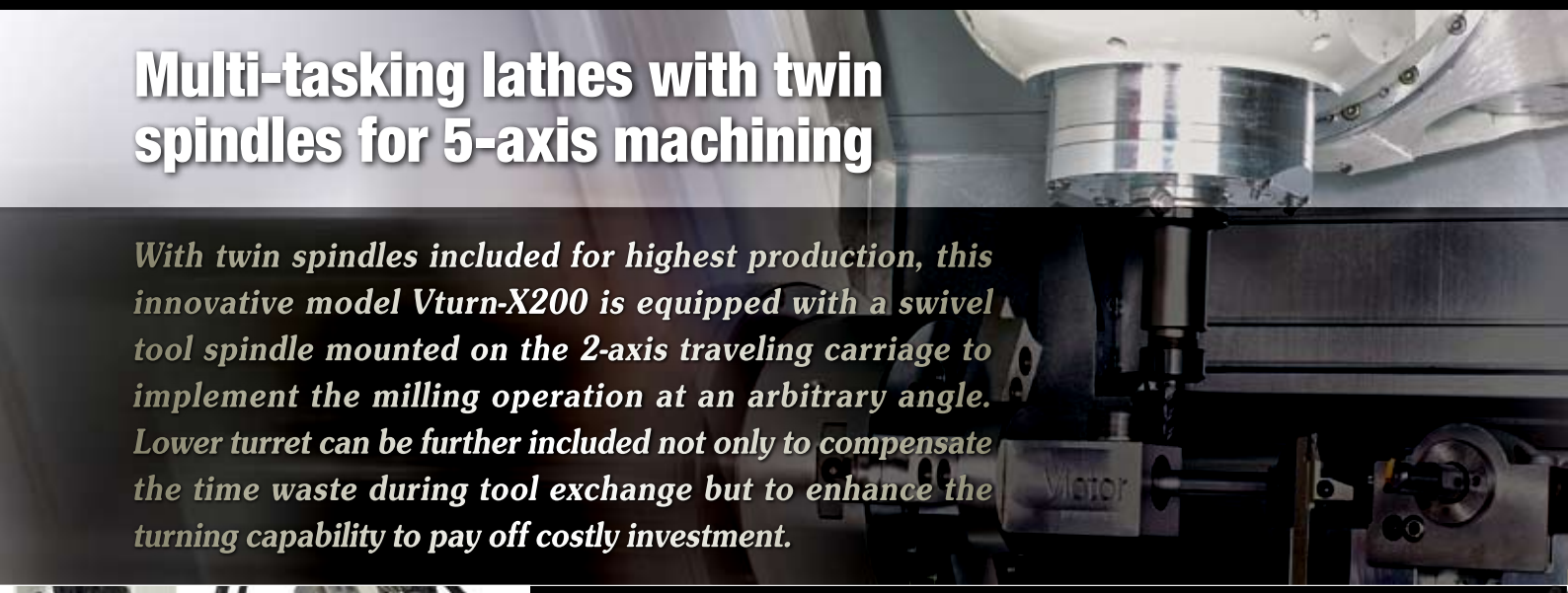
- *Multi-tasking lathe with twin built-in spindles*
- *4-axis or 5-axis machining in one set-up*
- *Roller geared swivel tool spindle*
- *ATC and 40-tool magazine*



Victor Taichung - an established ISO-9001 & 14001 company

Vturn-X200

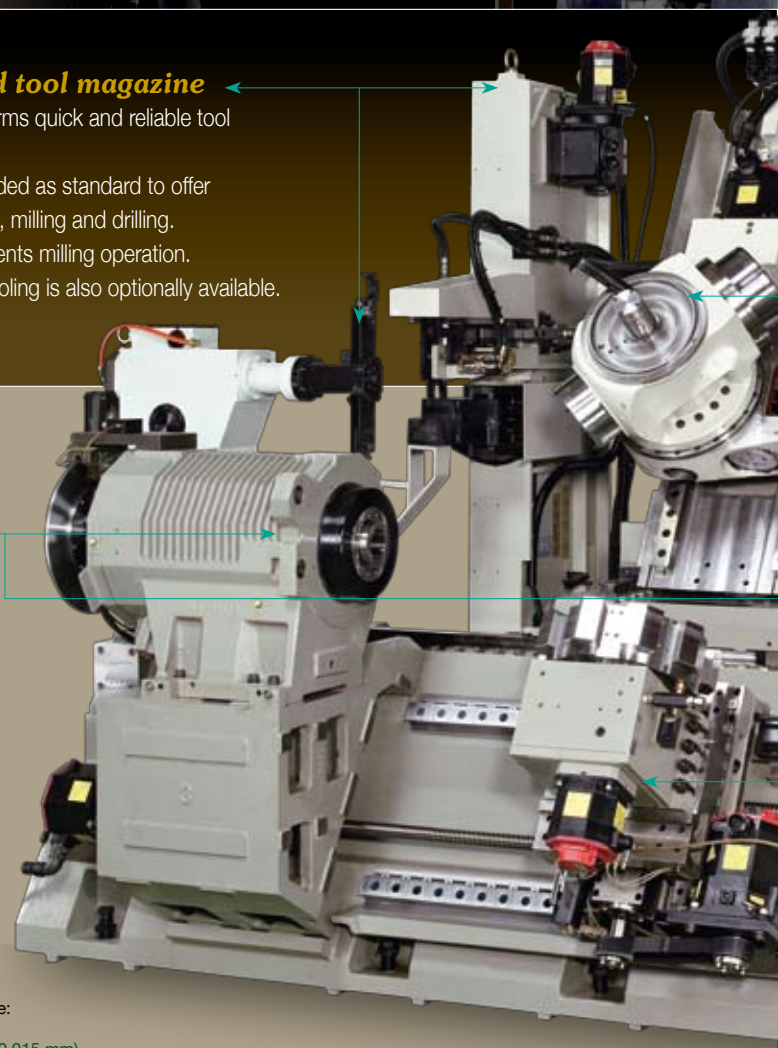
Multi-tasking lathes with twin spindles for 5-axis machining



With twin spindles included for highest production, this innovative model Vturn-X200 is equipped with a swivel tool spindle mounted on the 2-axis traveling carriage to implement the milling operation at an arbitrary angle. Lower turret can be further included not only to compensate the time waste during tool exchange but to enhance the turning capability to pay off costly investment.

Arm-type ATC and tool magazine

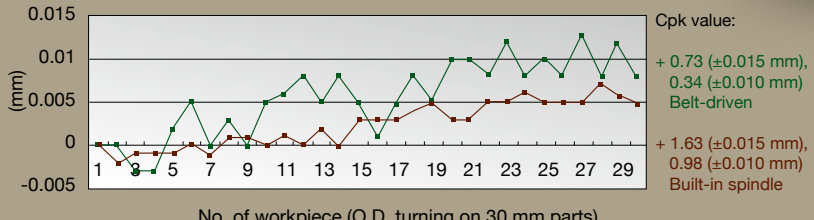
- Twin arm type ATC performs quick and reliable tool changeover.
- 40 tool magazine is included as standard to offer sufficient tools for turning, milling and drilling.
- HSK-T63 tooling implements milling operation. Kennametal KM-63UT tooling is also optionally available.



Twin Direct Drive Spindles (DDS)

- Spindle motor is integrated inside the headstock to eliminate the vibrations from belt or gear drives on the conventional design.
- High consistent accuracy (high Cpk value) is guaranteed because of less vibration and no belt tension variation.
- Twin independently controlled spindles with lower turret double the output and cover versatile machining applications to pay off costly investment.
- Spindle synchronization is included as standard for quick part changeover at spindle speed up to 2500 rpm.
- Angular encoder is included as standard to assure high angular accuracy ±0.01° (resulition 0.001°) for C-axis milling application.

Error Analysis



Cpk value:

+ 0.73 (±0.015 mm), 0.34 (±0.010 mm) Belt-driven

+ 1.63 (±0.015 mm), 0.98 (±0.010 mm) Built-in spindle

No. of workpiece (O.D. turning on 30 mm parts)

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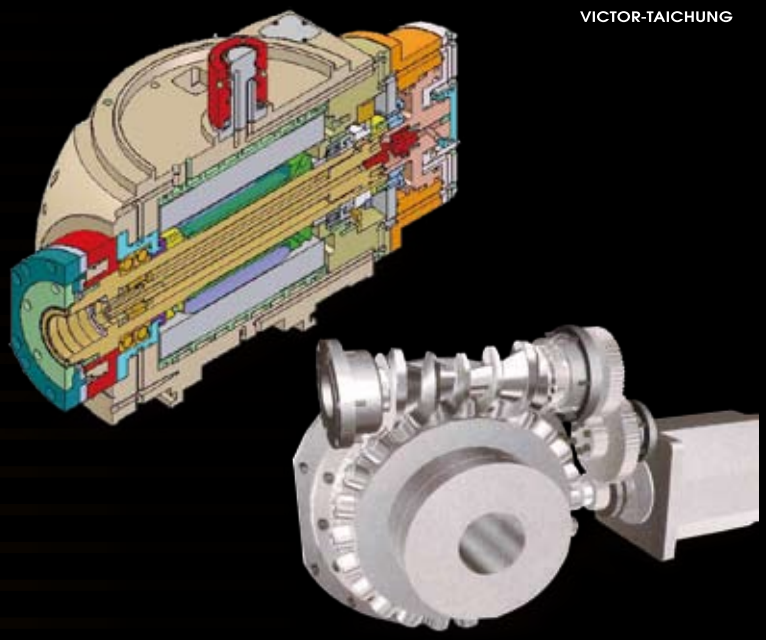
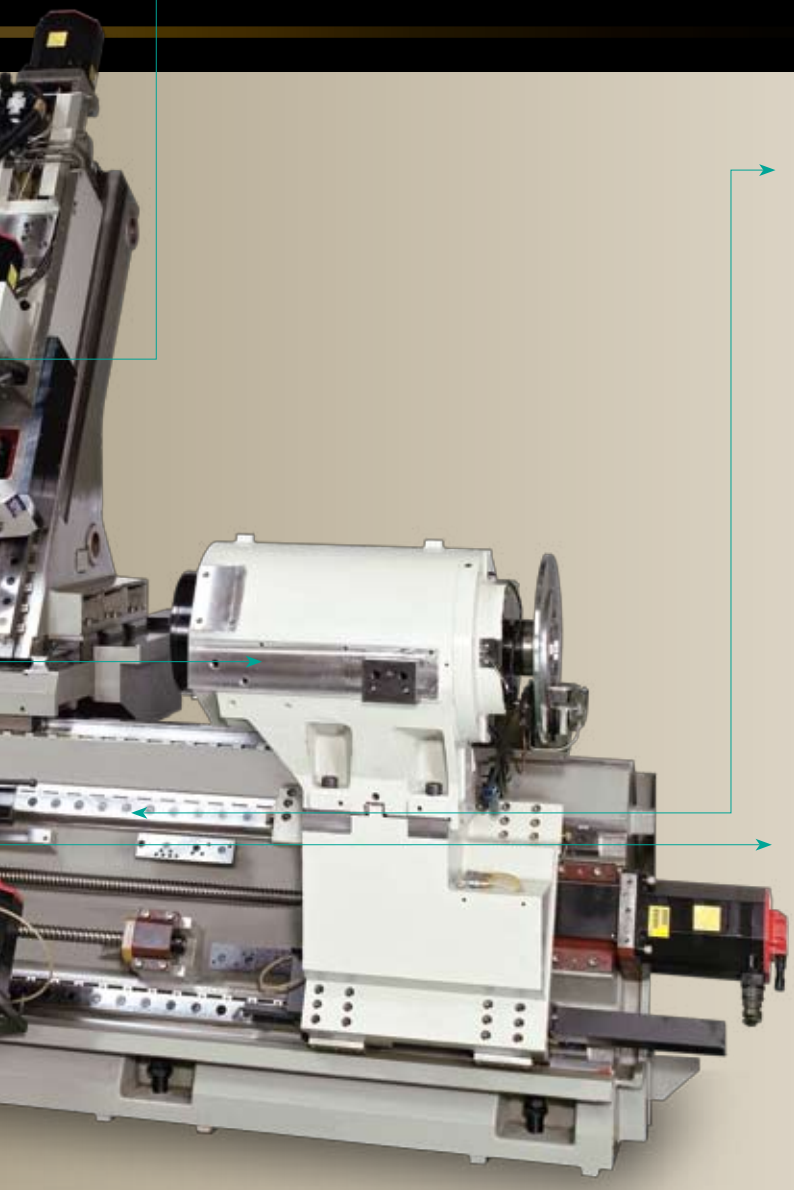
Swivel Tool Spindle (B-axis) with built-in spindle 22 kW (30 HP) / 12000 rpm

- Roller gear mechanism (instead of worm gear mechanism) minimizes the backlash and guarantees high accuracy at an arbitrary angle.
- Coupling is included as standard for B-axis to clamp the swivel tool spindle at every 5 degree indexing to enhance structure rigidity and the according milling & drilling capability.
- Built-in spindle (motor-spindle) with greased lubrication and Fanuc® built-in motor offers 22 kW (30 HP) / 110 Nm (149 ft-lbf) output at low base speed 1300 rpm.





Rigid machine structure

- Roller type LM guides support the heavy traveling carriage for tool spindle and lower turrets to assure smooth moving for minimal variation.
- Servo motors are directly coupled to the ballscrews for highly efficient power transfer.
- Only Fanuc α (alpha) type motors (instead of β (beta) type) are used for feed axes to assure quickest response for high performance.

Lower Turret (optional) reduces idle time during tool exchange

- Lower turret not only facilitates turning features like a conventional lathe but also reduces the idle time during the tool changeover for upper tool spindle.
- Lower turret offers a feasible solution to either accompany the turning with upper tool spindle on the 1st spindle or complete the 2nd operation for the 2nd spindle.
- Innovative 9 station turret minimizes possible un-commanded cutting by the opposite tool so as to allow more turning range.
- Servo driven turret used for twin spindles features quickest tool indexing and easy maintenance.

Done by One

Through Victor's own fixed forms for easy programming in Fanuc's Manual Guide i, Viurn-X200 integrates turning and milling in one machine to avoid set-up time waste dramatically and the according part re-loading errors for extremely high machining efficiency and accuracy.

1st spindle machining

- *Part changeover within 20 seconds. (excl. lower turret).*
- *Spindle synchronization up to 2500 rpm.*

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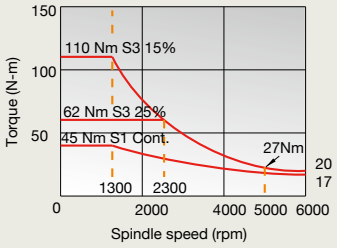
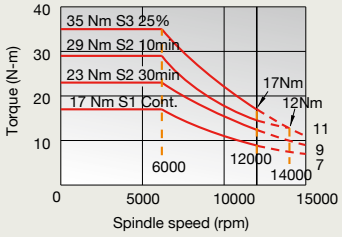
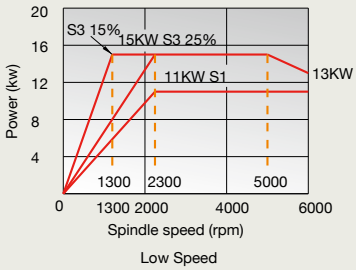
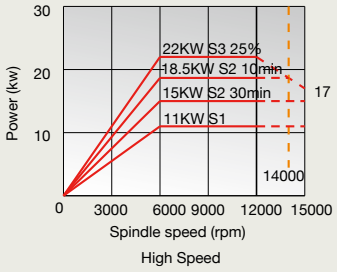
Tool Spindle Output



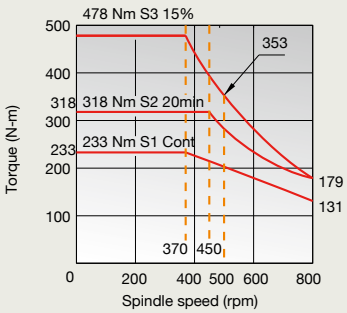


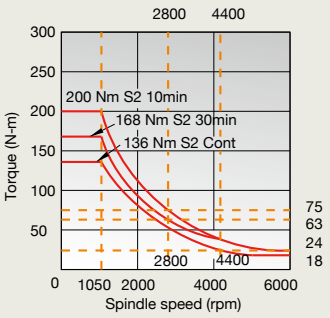


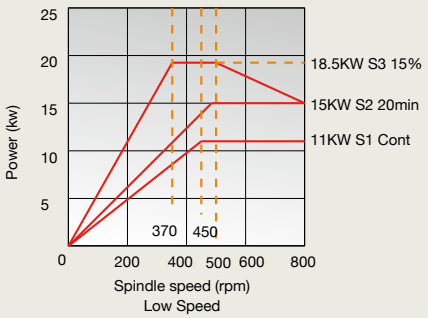


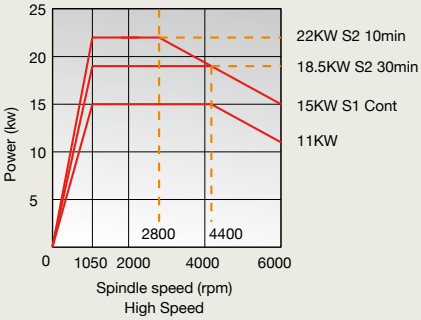
MILLING SPINDLE MOTORFANUC α Bil112S/15000

Twin Spindle Output









2nd spindle machining

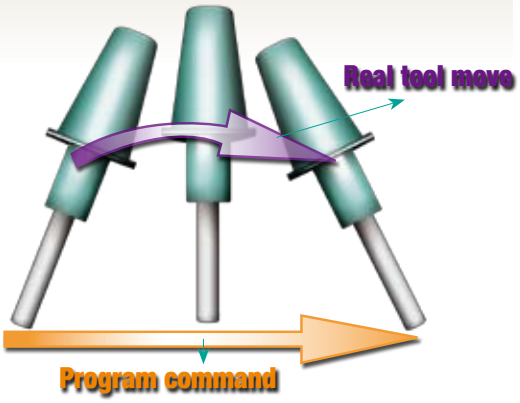
NC Package

Unique feature **additional monitor (touch panel)** releases more information about machine status and sample programs for easier operation and maintenance. More than 200 **Fixed Forms** for turning and milling modes exclusively developed by Victor Taichung have been included in Fanuc controller to simplify programming in the MGI (Manual Guide i) for complicated applications.

Fixed Form

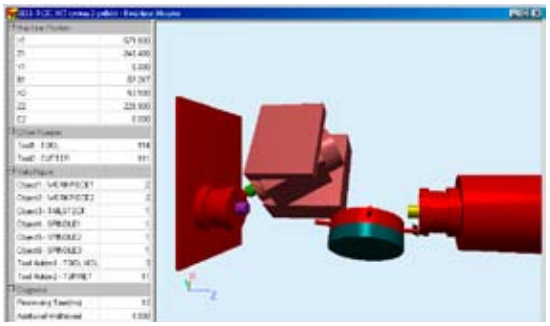
In **turning and milling** operation, **Tool Offset Conversion (TOC)** by a simple G code G342 B_M_D_I_(W_) is included as standard to compensate the tool offset in different tilting angle of tool spindle. When the 5-axis simultaneous machining option is required, Fanuc **TCP (Tool Center Point Control)** is included to provide an optimal tool guidance and prevents contour gouging. The interpolation between the start and end positions can be defined, so the ball-end milling can be implemented. The programmed feed rate and inclination angle can be also defined so as to obtain better surface quality during large compensating movement.

TCP (Opt.)

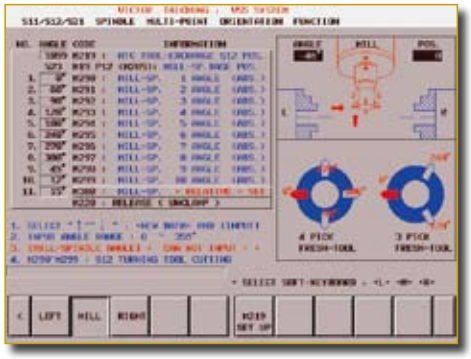


Victor's own software **Torque Limit Skip (TLS)** function has been included to detect the loading increase during part exchange between 2 spindles to assure part changeover successfully. With another powerful software Built-in **3D interference check (3DCHK)** included, the controller continuously checks the interference zone every 0.012 second and interrupts machining whenever a collision is imminent so as to increase the safety for the machine and its operators.

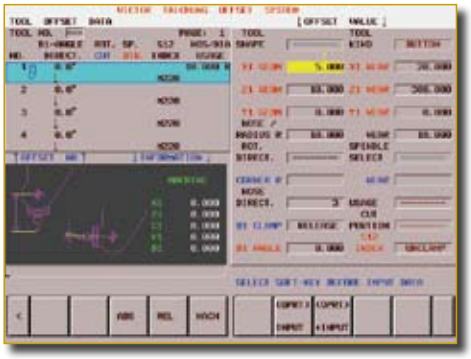
3DCHK



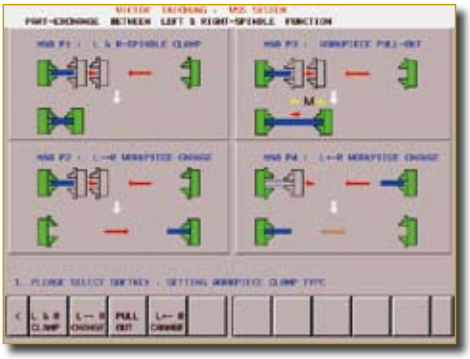
Conversational Interface (Victor Smart System, VSS)



Multi-point Spindle Orientation



Multi-tasking Tool Offset Setting



Part Exchange Between Spindles

Victor Taichung's Fanuc 31i Control Specification

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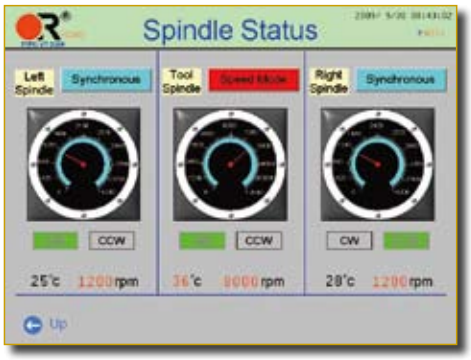
STANDARD:

ITEM	SPECIFICATION	DESCRIPTION
Control System:		
1	Control model	Fanuc 31i 2-path
2	Visual display unit	10.4" color LCD
3	Keyboard unit	Separate type MDI unit (standard keys) and extra Touch panel with command Keys
Axes and Spindle control:		
1	Max. Controlled Axes	20
2	Simultaneously controlled axes	4 (Upper X1, Z1, C1 Y, B) + 3 (lower X2, Z2, C2, E)
3	Spindles	3
4	Synchronous axes	Std. (twin spindles)
5	AIG-BAG (Unexpected disturbance torque detection)	Std.
Input command:		
1	Least input increment	X, Z, Y, E: 0.001 mm / 0.0001 inch.
2	Lease commend increment	X:0.0005 mm, Z, Y, E:0.001 mm, C, B:0.001 deg.
3	Maximum programmable dimension	±999999.999 mm / ±39370.0767 inch ±999999.999 deg
4	Absolute / Incremental programming	X, Z, C, Y, B, E (absolute only for B, E) / U, W, H, V
5	Decimal input	Std.
6	Program code	EIA / ISO automatic recognition
7	Program storage memory	Back up by battery
8	Inch / Metric conversion	G20 / G21
9	Programmable date input	G10
Feed functions:		
1	Cutting feed (when AI contouring control is not executed)	X, Z, Y, E:1-4800 mm/min (0.01-188 inch/min) B, C:1-4800 deg/min B, C:0.01-4800.0000 min/rev (0.000001-50.000000 inch/rev)
2	Dwell	G04
3	Feed per minute / rev.	G98 / G99
4	Thread cutting	G32
5	Thread cutting retract	Std.
6	Continuous thread cutting	Std.
7	Handle feed	Manual pulse generator (MPG) 0.001 / 0.01 / 0.1 mm (per pulse)
8	Automatic acceleration / deceleration	Std.
9	Linear acc / deceleration after cutting feed interpolation	Std.
10	Rapid feed override	F0 / 25 / 100% (changeable to 10% by switch)
11	Cutting feedrate override	0~150% (each 10%)
12	AI contouring control I + Nano smoothing	G5.1 (30 blocks)
13	3-D Manual feed	Std.
Program memory:		
1	Part program storage length	2560 m (1 MB)
2	Part program editing	Delete, insert, change
3	Program number search	Std.
4	Sequence number search	Std.
5	Address number search	Std.
6	No. of registered programs	2000 (in total)
7	Program storage memory	Back up by battery
8	Multiple program simultaneous editing	Std.
9	DNC though memory card	Std. (excl. memory card)
10	Extended part memory editing	Std.
11	Storage memory extension	By ATA or CF card (up to 1GB)
Programming support:		
1	Circular interpolation	Std.
2	Direct drawing dimension programming	Std.
3	Canned cycles	G90, G92, G94
4	Multiple repetitive canned cycles	G70~G76
5	Multiple repetitive canned cycles II	Std.
6	Synchronous / mixture control	Std. (for C-axis)
7	Sub programs	Std.
8	Balance cut	G68~G69
9	Custom macro	Std.
10	Addition to custom macro common variables	Std.
11	3-D coordinate system conversion	Std.
12	3-D rigid tapping	Std.
13	Helical interpolation	Std.
14	Manual handle retrace (2 path)	Std.
15	Manual Guide i	Std.
16	Tool offset conversion (Victor's PLC)	Std.
17	Torque limit skip function (Victor's PLC)	Std. (for part exchange)
18	Built-in 3D interference check (3DCHK) collision monitoring (3DCHK)	Std.
19	Victor Smart System (VSS)	Std.
Data interface:		
1	Ethernet (100BaseT)	Std.
2	PCMCIA port	Std. (excl. memory card)
3	RS-232-C	Std.

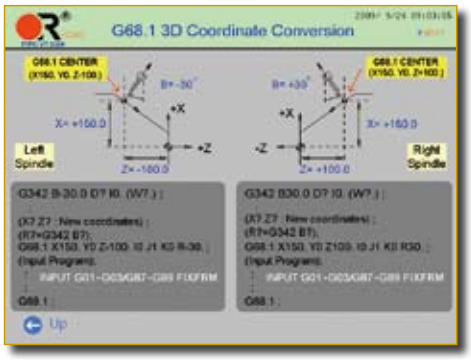
CONTROL OPTIONS:

1	Tilted working plane (TWP) command	
2	Tool center point (TCP) control	
3	5-axis simultaneous control Fanuc 31i-A5 including: - Tool posture control (TPC) - Cutting point command (CPC) - Nano Smoothing 2	
4	3-D cutter compensation (3DCRC)	
5	AI contouring control II (AICC-2, 200 blocks)	
6	Abnormal load detection	

Additional Monitor (Touch panel)



Spindle Status



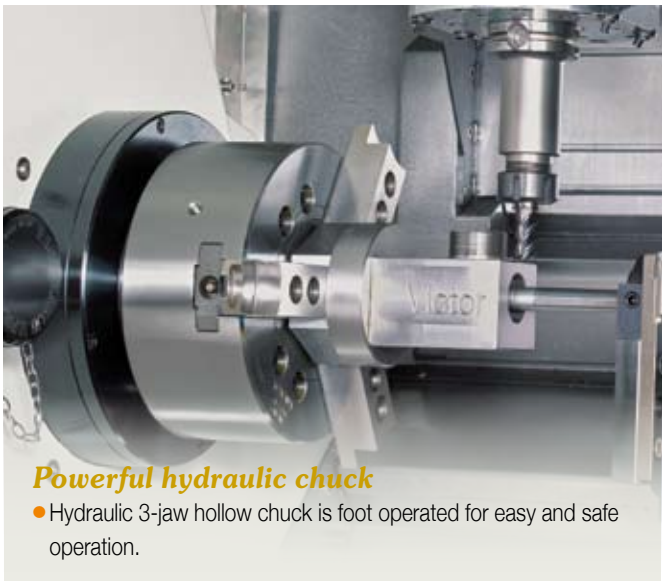
3D Coordinate Conversion

Magazine Maintenance

Standard Accessories

Ergonomic design for easy & safe operation

- Enclosed guarding with the high outlet **chip conveyor** fitted into the machine bed ensures no access to the machine during operation and no coolant leakages.
- **Front removed coolant tank** with **High pressure coolants** by Grundfos® pump SPK4-8 improves the machining quality on part surface. **Oil skimmer** is installed on coolant tank to separate the oil layer from coolants.
- **Rotary control box** with front mounted hydraulic gauges facilitate the easy adjustment and operation.
- **Spindle oil cooler** for twin DDS spindles and **air conditioner** for the electrical cabinet are both included to prolong service life for the costly control components.

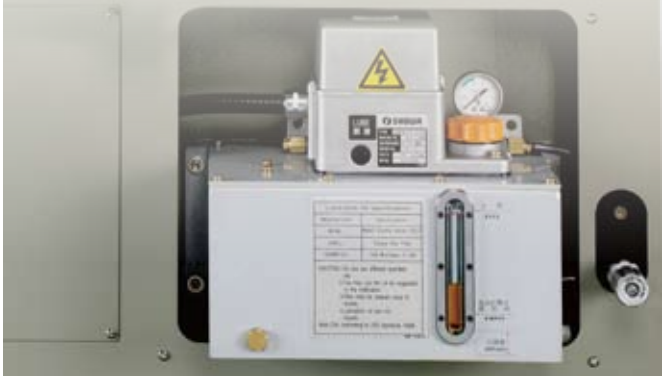


Powerful hydraulic chuck

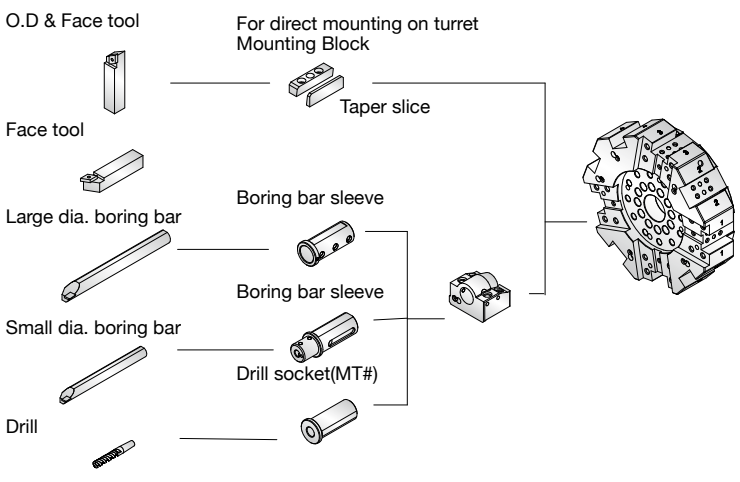
- Hydraulic 3-jaw hollow chuck is foot operated for easy and safe operation.

Showa® lubrication pump

- Qualified Japanese lube pumps (4 liters) assure long service life for machine operation.



Tooling Accessories for Lower Turret (opt.)



Tool	Vturn-X200
Tool shank for turret disk	25 mm
Maximum boring bar diameter	40 mm
Boring bar holder	
40 mm	4
Boring bar sleeve	
8 mm	1
10 mm	2
12 mm	2
16 mm	2
20 mm	2
25 mm	2
32 mm	2
Drill socket	
MT1	Opt.
MT2	1
MT3	1
'U' Drill holder	
32 mm	1
'U' Drill socket	
20 mm	Opt.
25 mm	1

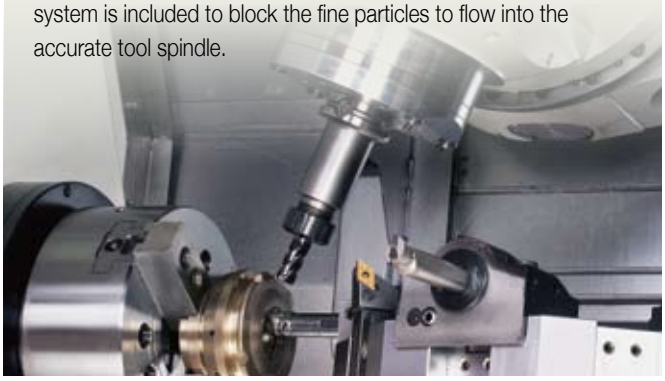
Optional Accessories

Detachable Manual Tool Presetter (Renishaw® MTP)

To save the laborious measuring time on the part diameter and tool wear-out, the tool presetter measures the tool length and diameter automatically by the probe touched by the tool tip. The detachable design allows for more space for machining and this type of MTP is also called TOOL EYE because of two probes for tool spindle and lower turret.

Coolant Through Spindle (CTS)

Similar as machining centers, the coolant through spindle (tool spindle) can be installed to offer the high pressure (20 bars / 60 Hz by Grundfos pump CRK2-180) coolants to reduce chips built-up and to upgrade the part surface finish and accuracy. Filtration system is included to block the fine particles to flow into the accurate tool spindle.

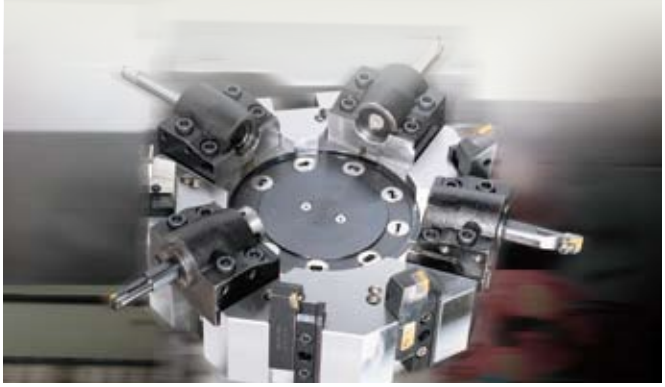


Independently Controlled Tailstock

For the long and slender parts machining where the supporting at part end is required, the 2nd spindle is replaced by the tailstock which can be programmed and moved along machine base at high feedrate and high accuracy.

Lower Turret

Lower turret offers a feasible solution to either accompany the turning with upper tool spindle on the 1st spindle or complete the 2nd operation for the 2nd spindle. In addition, the addition of lower turret reduces the idle time during tool changeover for tool spindle.



Multi-tasking Tools

Multi-tasking are specially designed by tool manufacturers to integrate multiple inserts or in one tool for specific application. With Victor's VSS software included, Vturn-X200 can use multi-tasking tools to reduce the frequency for tool exchange.

5-axis Simultaneous Machining

5-axis simultaneous machining can be easily implemented by the controller upgrade to Fanuc 31i-B5 control. However, the export of this special controller is subject to an authorization of government of the exporting countries and required application forms must be filled out.

Machine Specification

Items		Unit	Vturn-X200
Capacity	Swing over bed	mm	960
	Swing over carriage	mm	610
	Between centers	mm	1123
	Max. turning length	mm	1000
	Max. turning diameter	mm	540 (limited by carriage cover)
	Max. part diameter from 1st to 2nd spindle	mm	210 (limited by opt. lower turret)
Travels	X1-axis (upper tool spindle)	mm	600
	Z1-axis (upper tool spindle)	mm	1100
	Y-axis (upper tool spindle only)	mm	160 (±80)
	B-axis	deg	225 (+110 ~ -115)
	X2-axis (lower turret)	mm	150
	Z2-axis (lower turret)	mm	782 (±391)
	E-axis (2nd spindle)	mm	1050
Axis feed	X1/Z1/Y axis feed (upper tool spindle)	m/min	36 / 36 / 18
	X1/Z1/Y/B axis motor power	kW	5.5 / 7 / 4 / 3
	Ball screw dia. x pitch	mm	X1: 36 x P10, Z1: 40 x P12 Y: 36 x P10
	X2/Z2/E feed rate (lower turret and subspindle)	m/min	18 / 20 / 20
	X2/Z2/E motor power	kW	3 / 3 / 4
	Ball screw dia. x pitch	mm	X2: 32 x P10, Z2: 32 x P12 E: 36 x P10
Main spindle (1st spindle)	1st spindle nose (chuck)	inch	A2-6 (8")
	1st spindle speed	rpm	4200
	1st spindle motor power (cont/20min/15%)	kW	15 / 18.5 / 22
	Spindle bore	mm	62
	Bearing inside diameter	mm	100
	Bar capacity	mm	52
2nd spindle	2nd spindle nose (chuck)	inch	A2-6 (8")
	2nd spindle speed	rpm	4200
	2nd spindle motor power (cont/20min/15%)	kW	15 / 18.5 / 22
	Spindle bore	mm	62
	Bearing inside diameter	mm	100
	Bar capacity	mm	52
Upper tool spindle (B-axis milling head)	Turret type	rpm	Milling head with ATC
	Positioning indexing resolution	deg.	5 (by coupling)
	Continuous indexing resolution	deg.	0.001 (by roller gear)
	Max. speed	rpm	12000
	Milling motor power (cont. / 30 min. / 25%)	kW	11 / 15 / 22
ATC & tool magazine	Tool specification	-	HSK-T63 (Opt. KM-63UT)
	Tool capacity	-	40
	Tool selection	-	Fixed tool pot number
	Max. tool diameter	mm	90
	Max. tool length	mm	280
	Max. tool weight	kg	7
	Tool exchange time	sec	1.8 (T-T), 20 (chip-chip)
Lower turret (Optional.)	No. of tools	-	9
	Tool shank size	mm	□25
	Max. boring bar diameter	mm	40
	Tool exchange time	sec	1.2 (0.4 excl. disk up / down)
Machine	Controller		Fanuc 31i
	Tank capacity	L.	560
	Power requirement	kVA	85 (95 with lower turret)
	Floor requirement	mm	5500 x 3400 x 2600
	Net weight	kg	12000

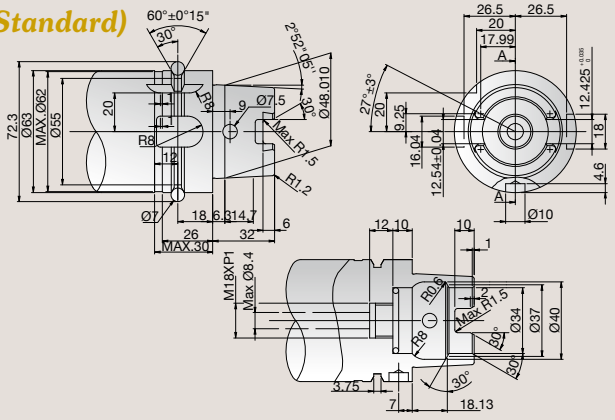
Standard accessories:

- KITAGAWA® hydraulic chuck with soft jaws
- Chip conveyor with cart
- Spindle oil cooler
- Fully enclosed splash guarding
- Hand-wheel (Remote MPG)
- Oil skimmer
- Higher pressure coolant by Grundfos® pump SPK4-8
- SHOWA® lubrication pump
- Coolant flush on Z-axis cover
- 3 step warning light
- Air conditioner for electrical cabinet
- Fanuc manuals by CD ROM

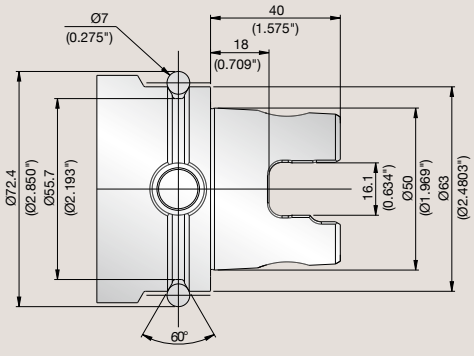
Optional accessories:

- Hard jaws
- Detachable Manual Tool Presetter (Renishaw® MTP)
- KM-63UT tooling
- Lower turret with tooling accessories (excl. VDI tooling)
- Auto door
- Bar feeder interface
- Parts catcher (not for lower turret)
- Air blow above (or through) chuck
- Coolant Through Spindle (CTS)
- Independently controlled tailstock
- Fanuc manuals
- Fanuc 31i-B5 control for 5-axis simultaneous machining

HSK-T63 (Standard)

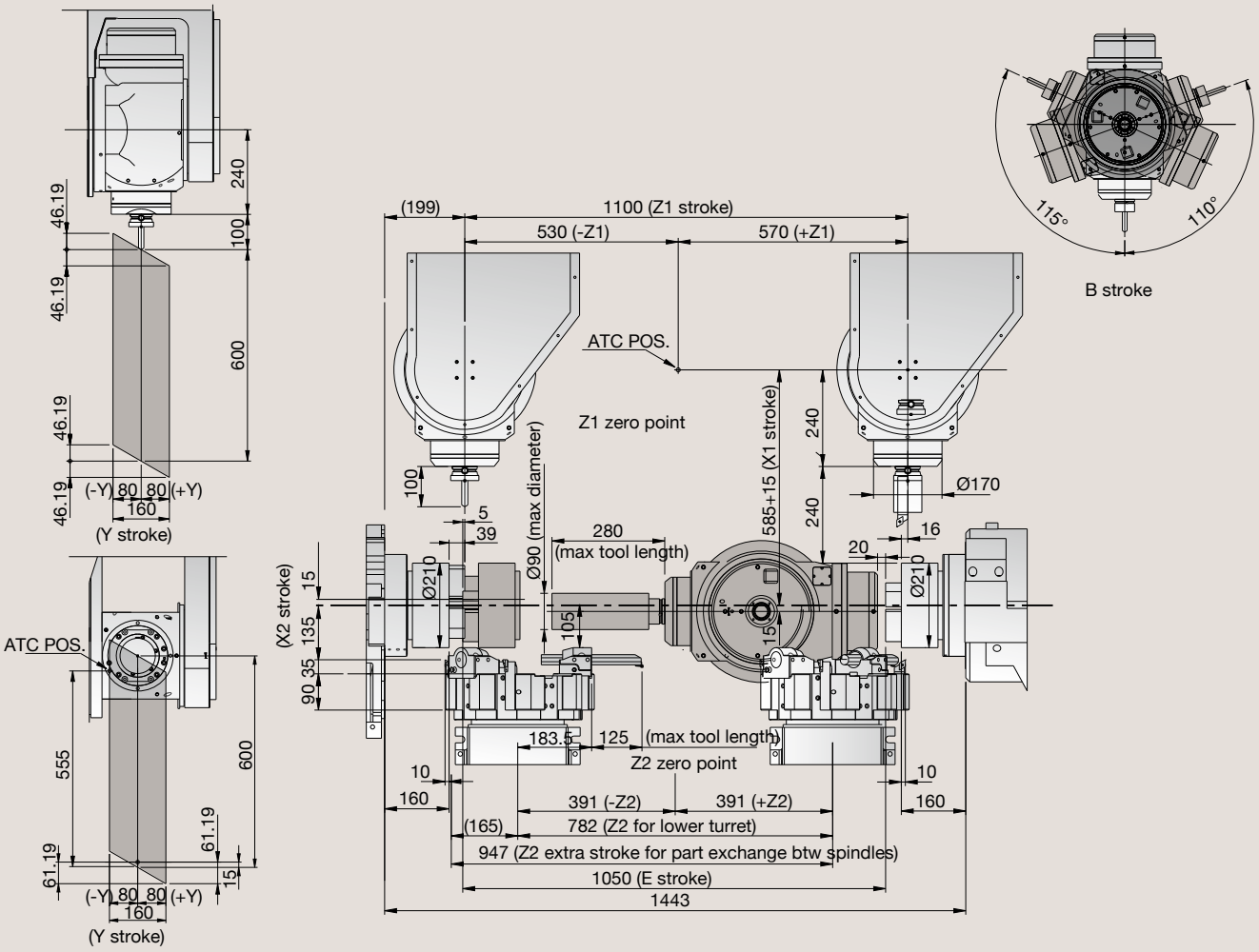


KM-63UT (Optional)

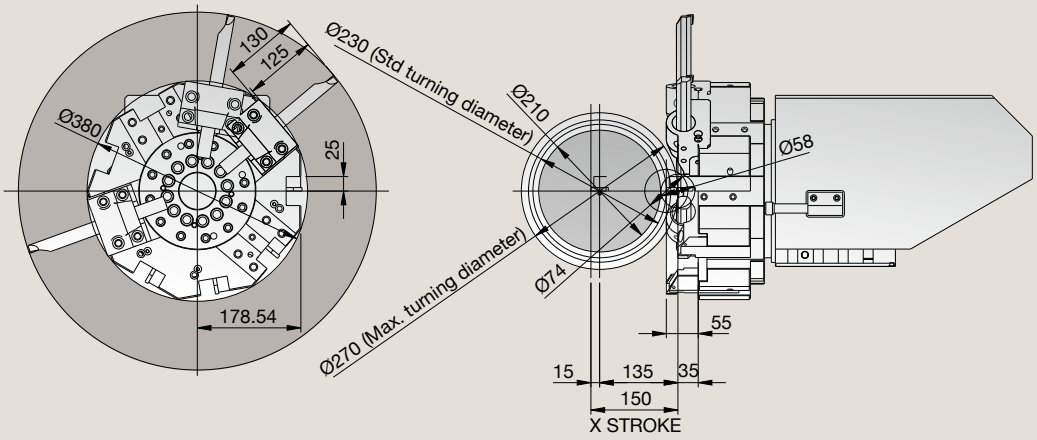


Machining Range

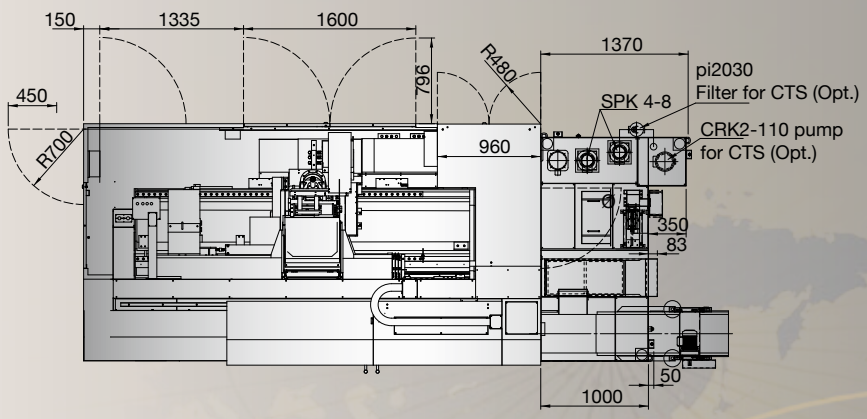
Tool spindle

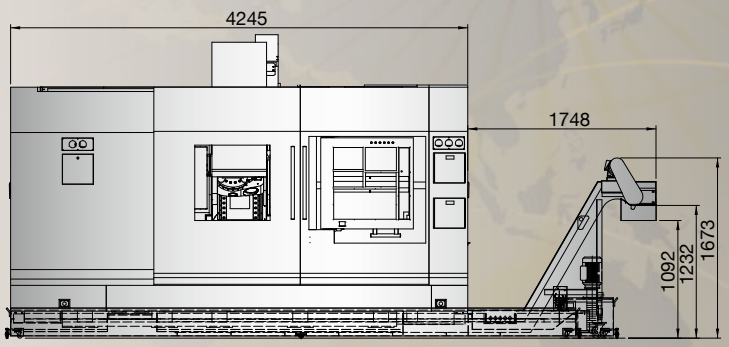


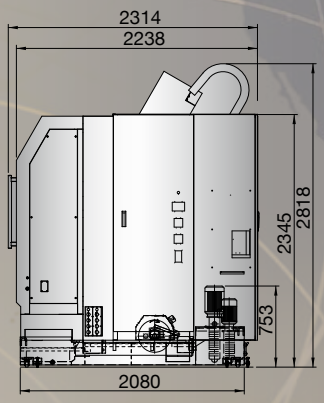
Lower turret (optional)



Machine Layout







VictorTaichung profile:
Sales turnover: USD 218.0 mil's (in 2010)*
No. of employees: 1101
*Exchange rate: 1 USD=30 TWD.

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