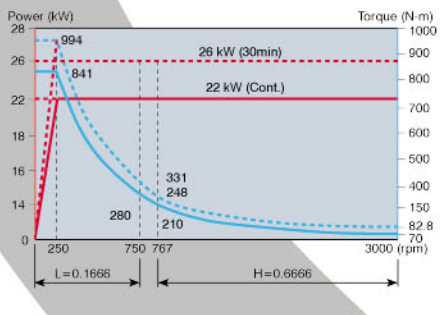
JOHNFORD®

# Vertical Turning Centers

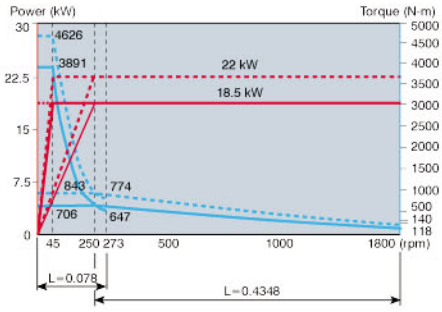
VTC-650/750/800
VTC-800ATC/1000ATC/1200ATC
VTC-1600ATC/2000ATC/2500ATC

# Vertical Turning Center

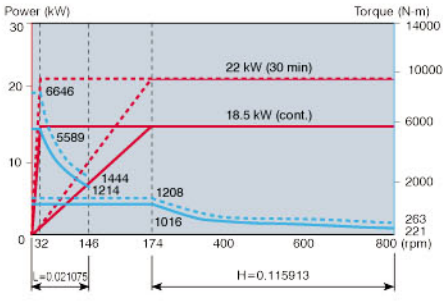
## VTC-650 / 750 / 800 / 800ATC




**VTC-650**
■ ZF-2 steps gear box




**VTC-750**
■ ZF-2 steps gear box

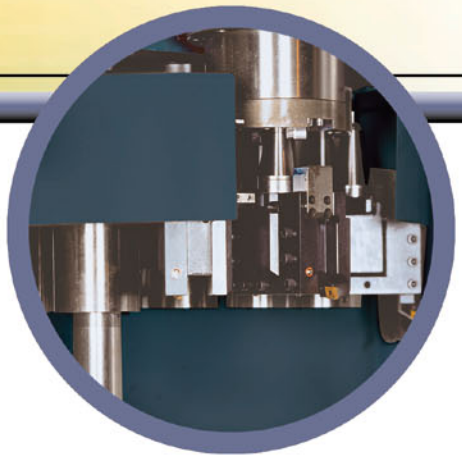



**VTC-800 / 800ATC**
■ ZF-2 steps gear box

- The specially designed for machining of larger and heavy components.
- With APC (Automatic Pallet Changer) designed allows easy loading / unloading workpiece and reduced idle times.
- Double Turret is available to reduce cutting times and machining operations.

*Automatic Chuck Changer (ACC)*

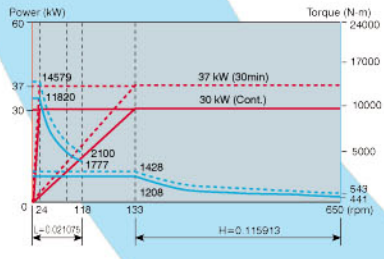
*Automatic Material Handling System*



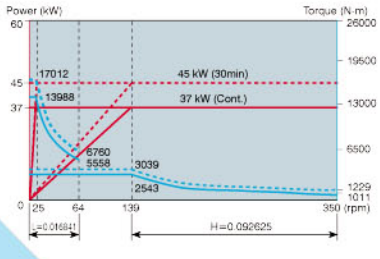
*Automatic tool changer (ATC)*

# Vertical Turning Center

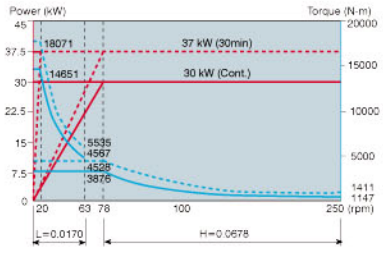
## VTC-1000 / 1200 / 1600 / 2000 / 25



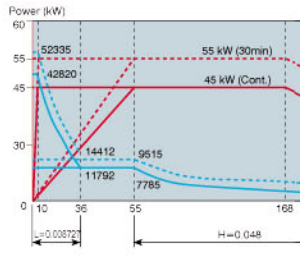

**VTC-1000ATC**
■ ZF-2 steps gear box



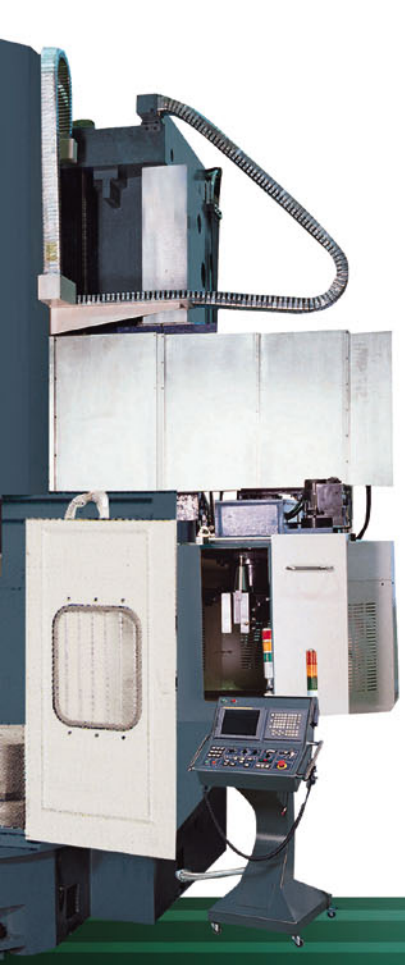

**VTC-1200ATC**
■ ZF-2 steps gear box



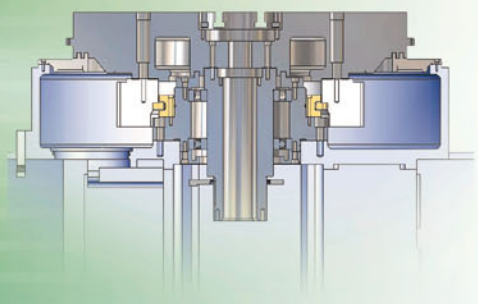

**VTC-1600ATC**
■ ZF-2 steps gear box



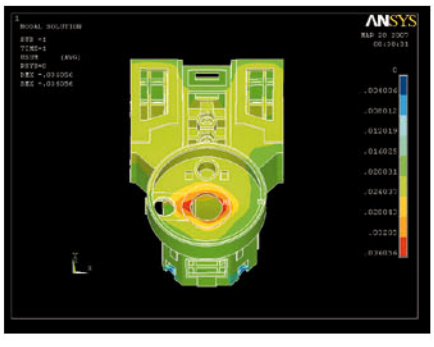

**VTC-2000ATC ~ 2500ATC**
■ ZF-2 steps gear box



- High rigidity of table and column are mounted on a common bed.
- High stability of thermal distortion is minimized by the thermal-symmetry layout of ribs on the machine bed. High precision of table is supported on large diameter.
- INA Axial / radial bearings to provided high loading heavy machining.
- Powerful spindle motor with ZF two speed gear box for larger output torque.

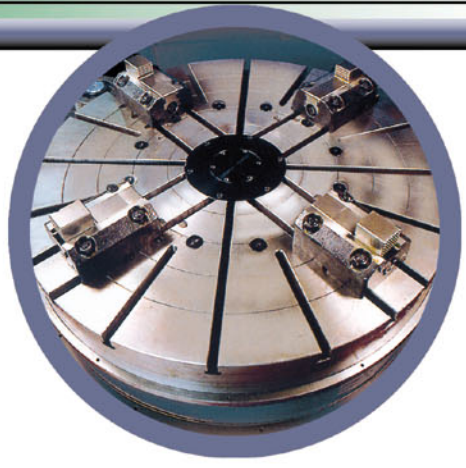


# 00 ATC




*Thermal-symmetry (FEA)*

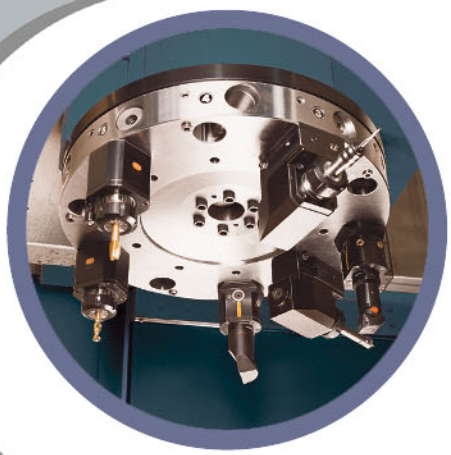
*High efficiency of ZF gear box (over 95%)*



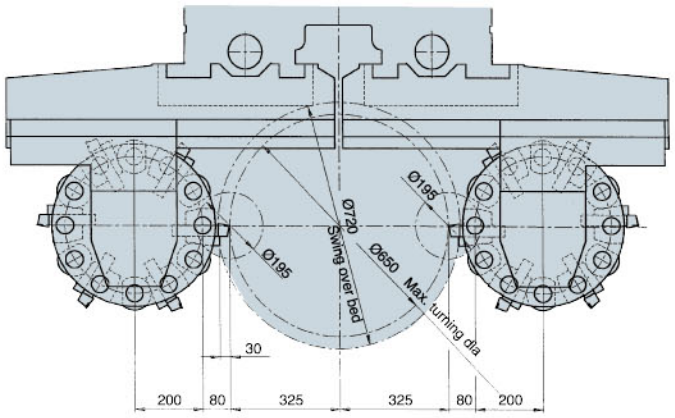
*High rigidity table construction*

# Tooling Interference

## VTC-650

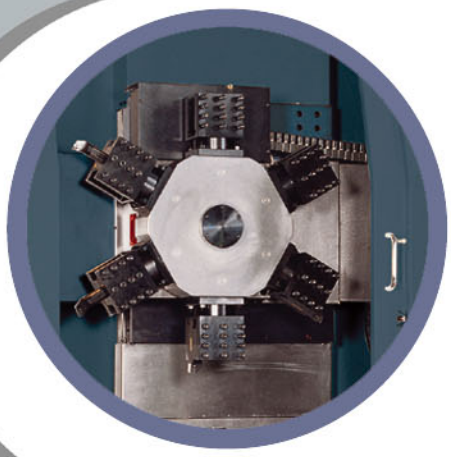


6, 8-Stations Turret

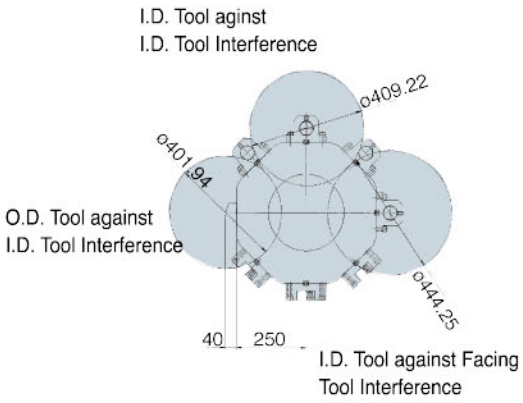


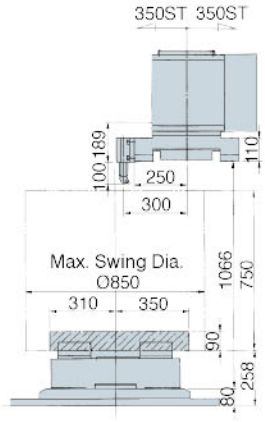

VDI Turret Capacity

## VTC-750



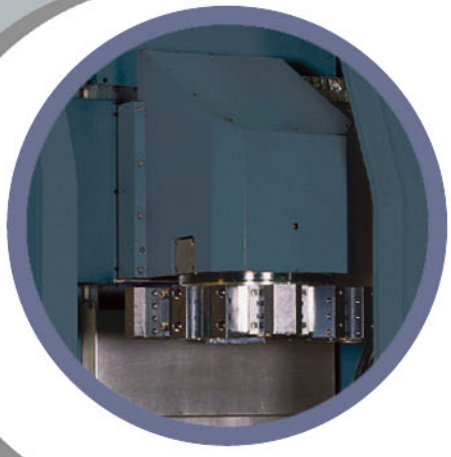
6, 8-Stations Turret



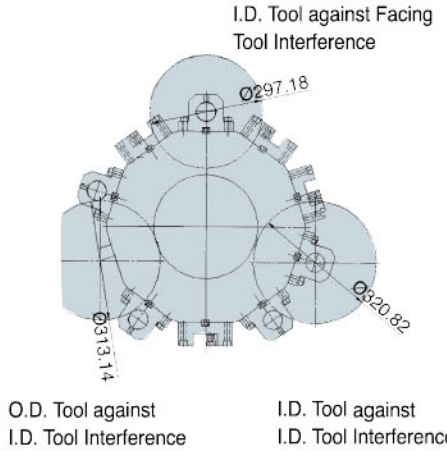



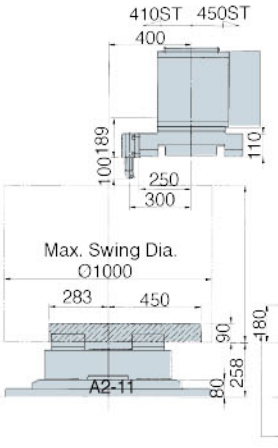

8-Angle Turret Tooling Capacity

## VTC-800

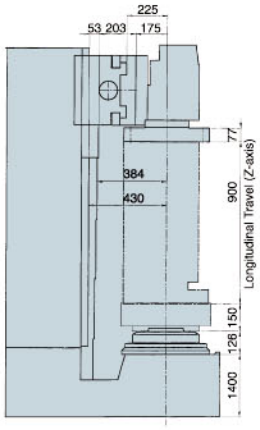


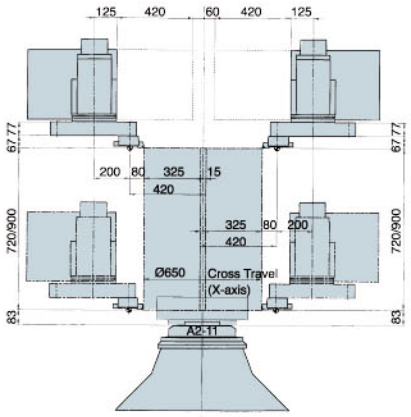
10-Angle Turret



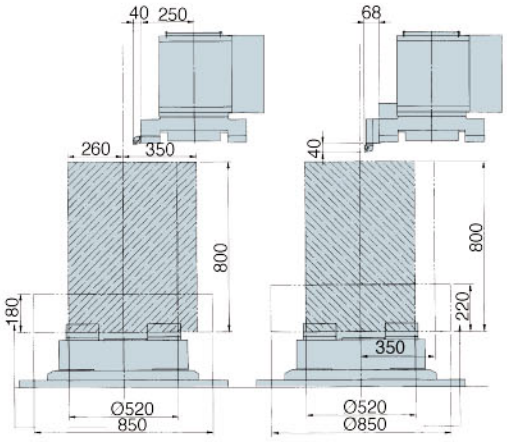




10-Angle Turret Tooling Capacity

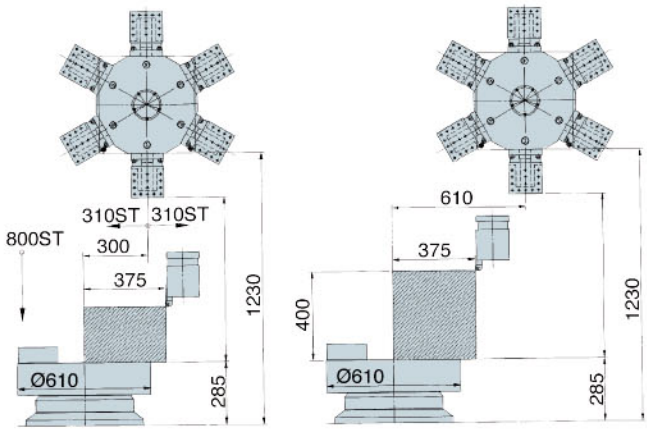


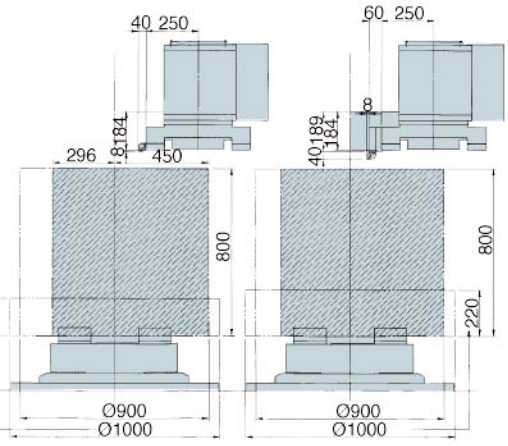

**VDI Turret Working Range**



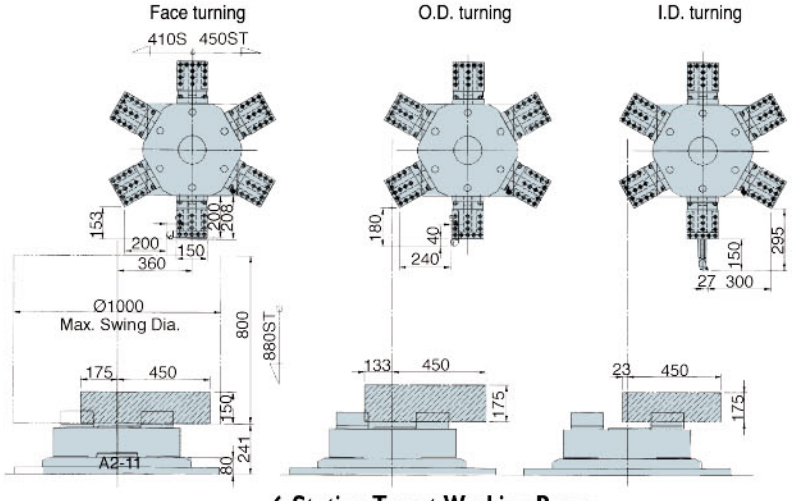

**8-Angle Turret Working Range**




**6-Angle Turret Working Range**




**10-Angle Turret Working Range**

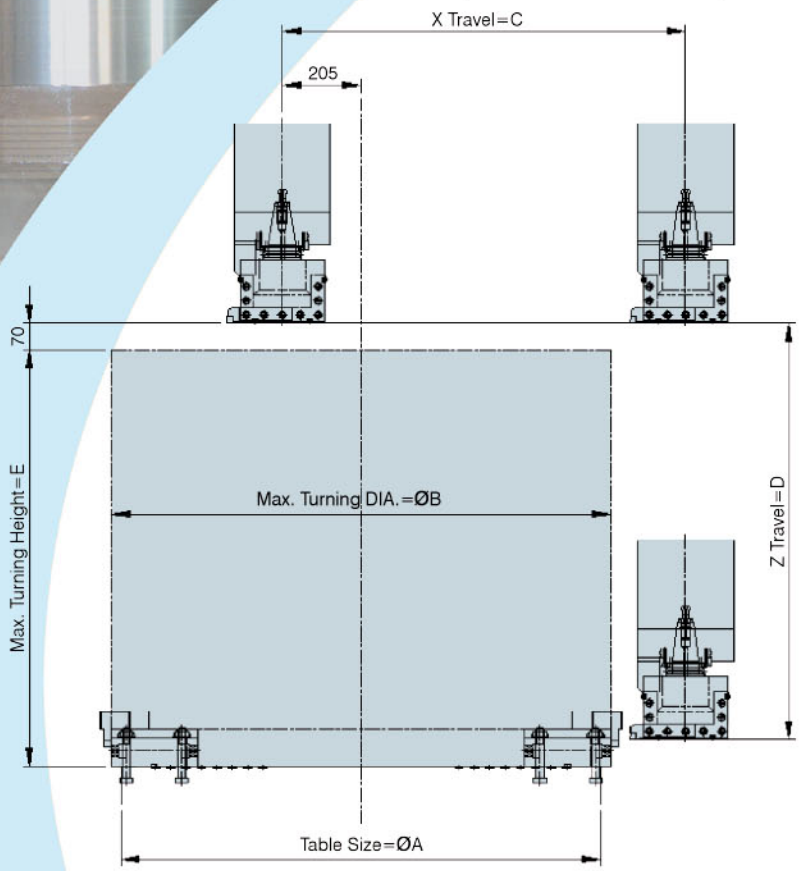


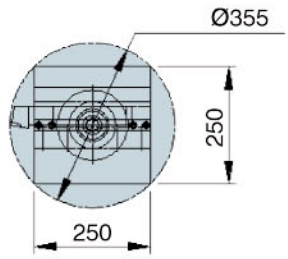

**6-Station Turret Working Range**

# Tool Diagram

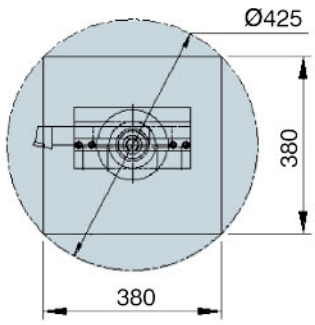
## VTC-800ATC / 1000ATC / 1200ATC / 1600ATC / 2000ATC/ 2500ATC

| Model | A | B | C | D | E |
|---|---|---|---|---|---|
| VTC-800ATC | ϕ810 | ϕ1000 | 870 | 900 (Std.) | 800 |
| VTC-1000ATC | ϕ1000 | ϕ1200 | 970 | | 800 |
| VTC-1200ATC | ϕ1250 | ϕ1600 | 1170 | | 1250 |
| VTC-1600ATC | ϕ1600 | ϕ2000 | 1370 | | 1250 |
| VTC-2000ATC | ϕ2000 | ϕ2500 | 1685 | 1000 (Std.) | 1600 |
| VTC-2500ATC | ϕ2500 | ϕ3000 | 1935 | | 1600 |



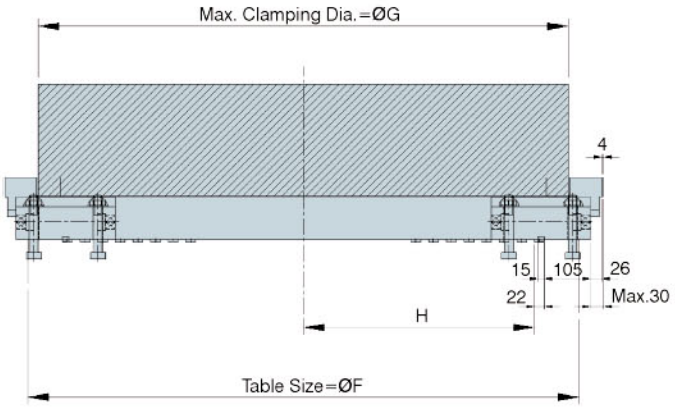

*VTC-800 / 1000 / 1200 / 1600*
*Min. Turning Diameter*

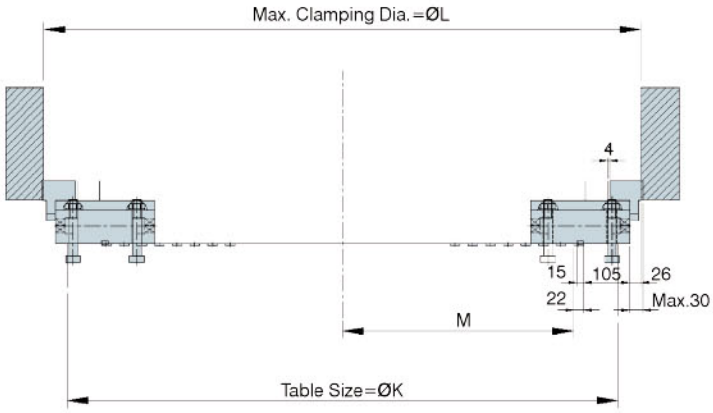


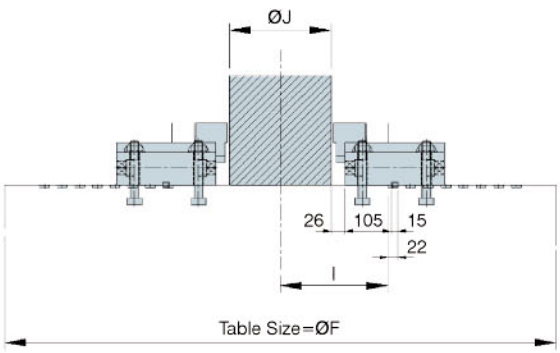

*VTC-2000 / 2500*
*Min. Turning Diameter*

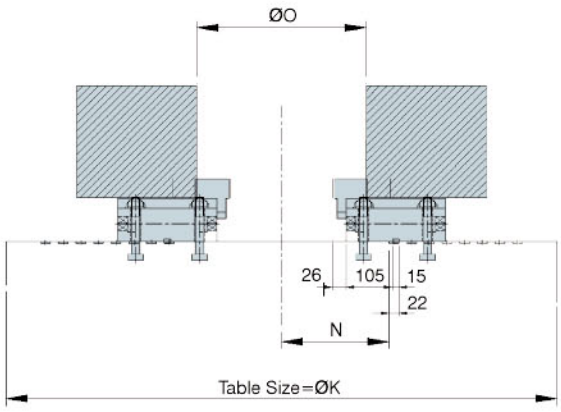
## Turret Data

| Item \ Model | VTC-650 | VTC-750 | | VTC-800 | |
|---|---|---|---|---|---|
| Turret type | H12-ANG. | V4, 5, 6-station | H10-ANG | V4, 5, 6-station | H10-ANG |
| Number of tools | 12 X 2 | 4, 5, 6 | 10 | 4, 5, 6 | 10 |
| Tool shank size | □ 25, ϕ40 | □ 32, ϕ40 | | □ 32, ϕ50 | |
| Tool holder | 12 pcs x 2 | 4, 5, 6 pcs | 10 pcs | 4, 5, 6 pcs | 10 pcs |
| Boring bar bush | ϕ8, ϕ10, ϕ12, ϕ16, ϕ20, ϕ25 | | | | |
| Drilling sleeve | MT2, MT3 | | | | |




| Model | F | G | H | I | J | K | L | M | N | O |
|---|---|---|---|---|---|---|---|---|---|---|
| VTC-800ATC | ϕ810 | ϕ762 | 304 | 214 | ϕ172 | ϕ810 | ϕ914 | 304 | 214 | ϕ324 |
| VTC-1000ATC | ϕ1000 | ϕ994 | 429 | 229 | ϕ210 | ϕ1000 | ϕ1150 | 429 | 229 | ϕ356 |
| VTC-1200ATC | ϕ1250 | ϕ1194 | 529 | 244 | ϕ240 | ϕ1250 | ϕ1340 | 524 | 244 | ϕ386 |
| VTC-1600ATC | ϕ1600 | ϕ1514 | 684 | 244 | ϕ240 | ϕ1600 | ϕ1660 | 684 | 244 | ϕ386 |
| VTC-2000ATC | ϕ2000 | ϕ1914 | 884 | 244 | ϕ240 | ϕ2000 | ϕ2060 | 884 | 244 | ϕ386 |
| VTC-2500ATC | ϕ2500 | ϕ2414 | 1134 | 244 | ϕ240 | ϕ2500 | ϕ2560 | 1134 | 244 | ϕ386 |

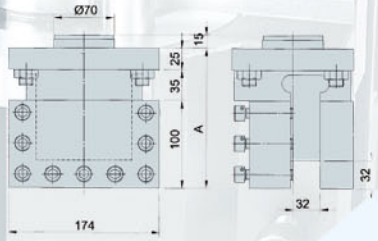
## *ATC Data*

| Item / Model | VTC- 800ATC / 1000ATC / 1200ATC / 1600ATC / 2000ATC / 2500ATC |
|---|---|
| ATC type | Armless ATC 12 tools (Std.), 24 / 40 / 60 tools (Opt.) |
| Type of tool shank | 7 / 24 taper BT-50 |
| Max. of tool size for automatic tool changing | 355 W x 150 T x 350 L |
| Max. tool weight | 50 kg |
| Max. loading of ATC | 360 kg |
| Tool change time (ATC) | 30 sec |

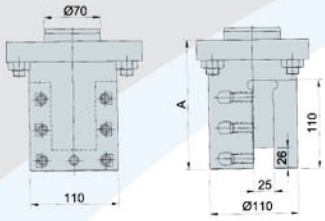
# Cutting Tool

## 6-Angle Turret

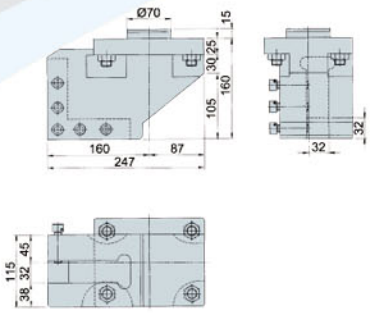
Unit: mm



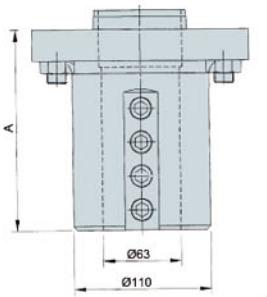

| Model | A |
|---|---|
| 766121 | 160 |
| 766122 | 200 |




| Model | A |
|---|---|
| 766123 | 160 |
| 766124 | 210 |
| 766125 | 260 |

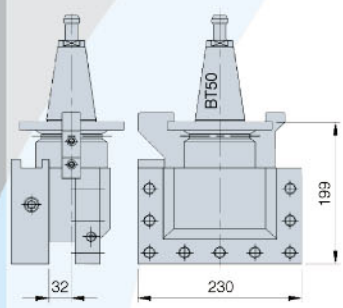



| Model | A |
|---|---|
| 766126 | 160 |

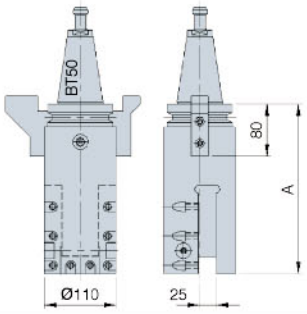



| Model | A | B |
|---|---|---|
| 766127 | 200 | 50 |
| 766128 | 300 | 50 |
| 766129 | 200 | 63 |
| 766130 | 300 | 63 |

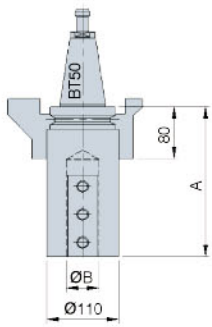
## ATC



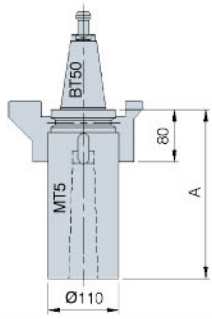

| Parts No. | Remark |
|---|---|
| 766100 | Std. |




| Parts No. | A | Remark |
|---|---|---|
| 766101 | 260 | Std. |
| 766102 | 310 | Opt. |
| 766103 | 360 | Opt. |




| Parts No. | A | B | Remark |
|---|---|---|---|
| 766104 | 230 | 50 | Std. |
| 766105 | 330 | 50 | Opt. |
| 766106 | 230 | 60 | Std. |
| 766107 | 330 | 60 | Opt. |



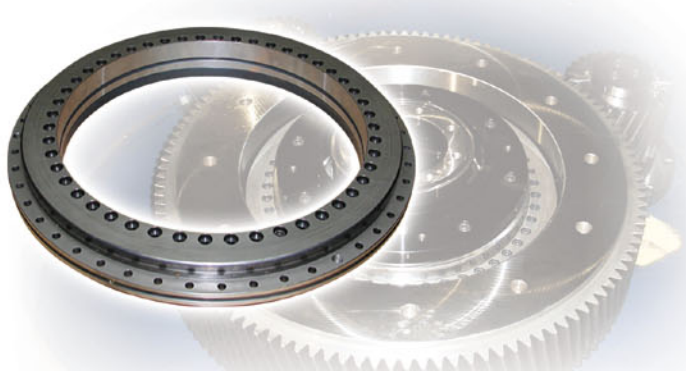

| Parts No. | A | Remark |
|---|---|---|
| 766108 | 210 | Std. |
| 766109 | 310 | Opt. |

## Axial / Radial Bearing (INA)

The axial/radial bearing YRT Speed is a German-made and ready-to-fit high precision bearing for high precision applications with combined loads. It can support radial loads, axial loads from both sides and tilting moments without clearance and are particularly suitable for bearing arrangements with high requirements for running accuracy, such as rotary tables.

The bearing has an axial component and a radial component. The axial component comprises an axial cylindrical roller and cage assembly, an outer ring, L-section ring and shaft locating washer. The radial component is a cage-guided, preloaded cylindrical roller set. The unit is located by means of retaining screws for transport and safe handling.

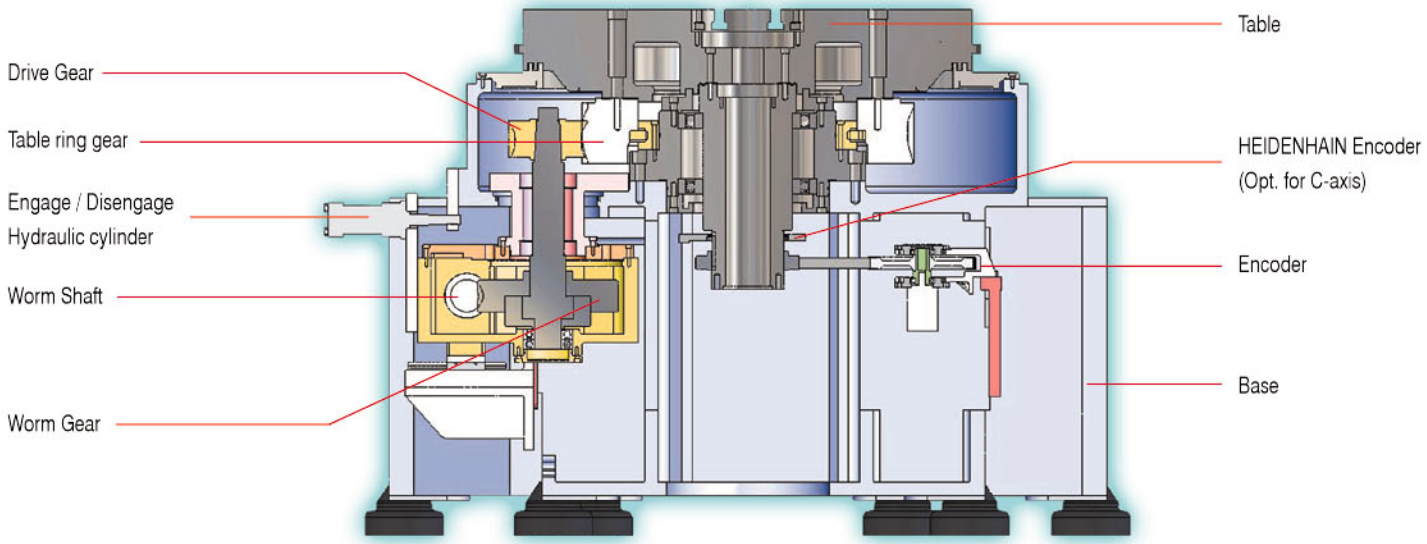
The axial/radial bearing is supplied without seals. It is lubricated and cooled by oil via the outer ring and L-section ring. It is suitable for operating temperatures from -30˚C ~ +120˚C. Due to the fixing holes in the bearing rings, the units are very easy to fit. The bearing is radially and axially preloaded after fitting. Besides, it has high limiting speeds and very low, uniform frictional torque across the whole speed range, so you can have easy and wide application in you job.

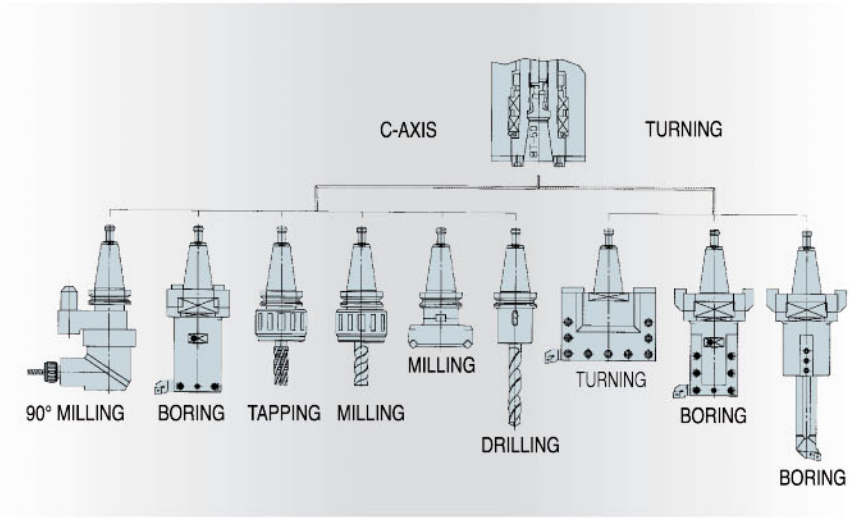


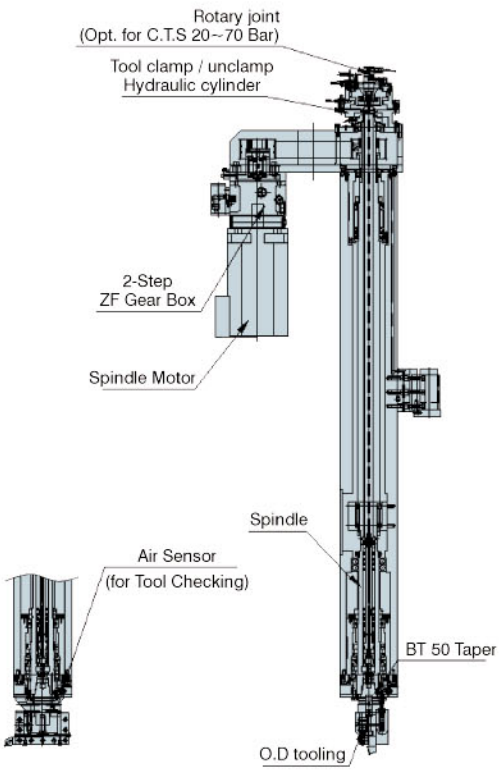
# Multiple Function Characteristics

## C-axis Driving Machanism

The C -axis feed prmon has a backlash-free wind - up mechanism for accurate table indexig. The positioning is detected by rotary encoder, accurate table indexing is possible. In the loading mode, this pinion is released by the hydraulic shifting gear located the C - axis feed gear box.



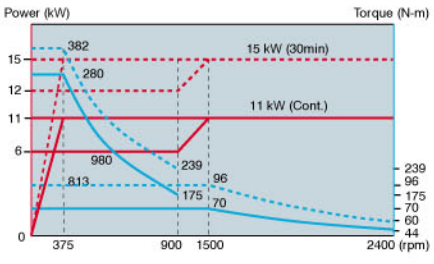




### Live Tooling

Face milling, End milling, Drilling, Boring and Turning.

### Structure of power spindle for live tooling

A spindle motor is located on top of the ram to rotate the spindle.

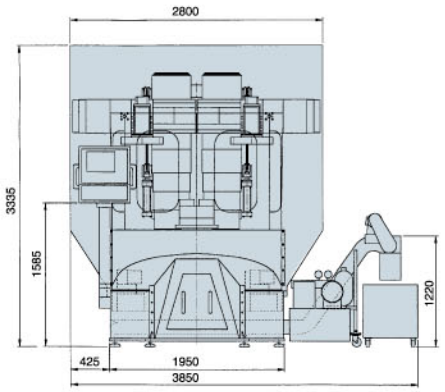



**VTC-800 ~ 2500ATC**

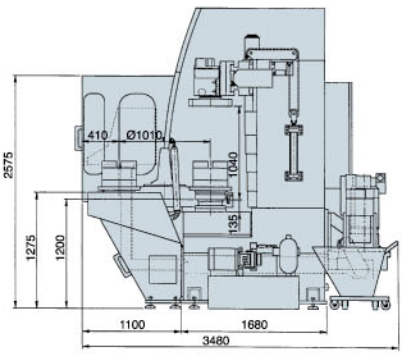
■ ZF-2 steps gear box

# Dimensions

## VTC-650

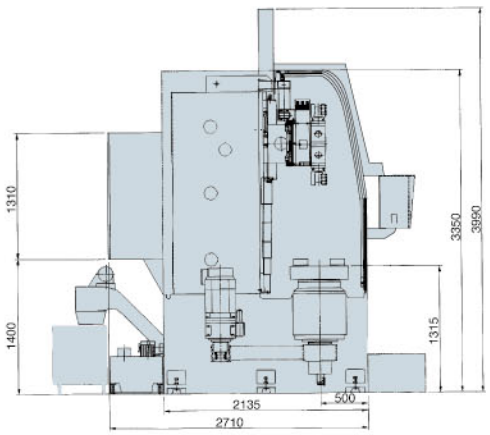



Front View

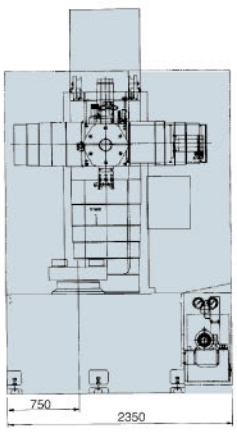



Side View

## VTC-750

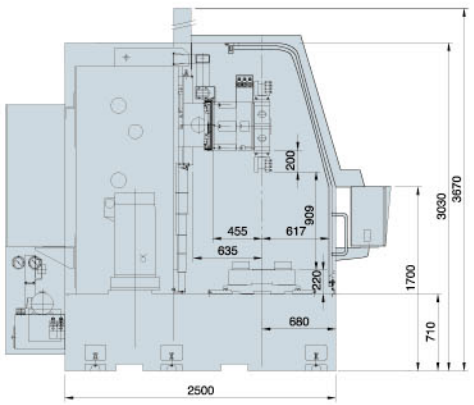



Front View

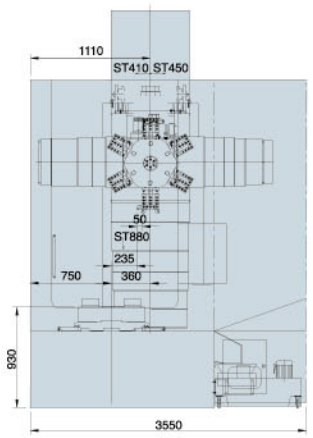



Side View

## VTC-800

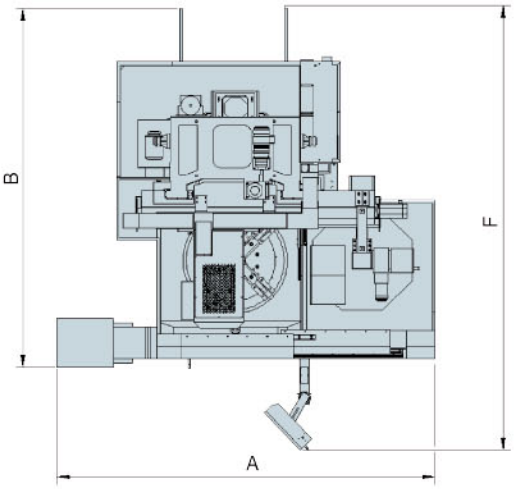



Front View

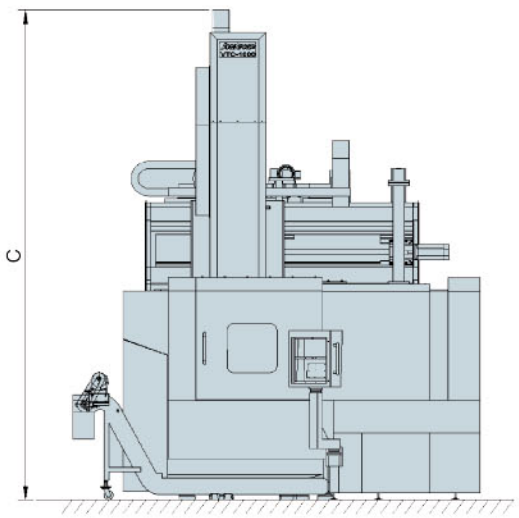



Side View

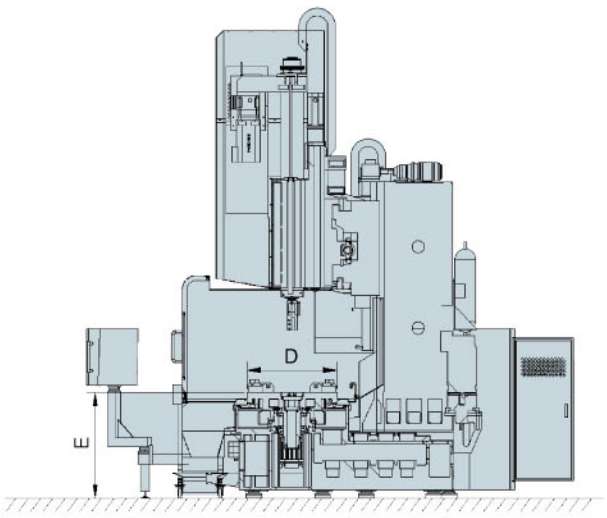
## VTC-800ATC ~ 2500ATC




Top View (floor space required)




Front View




Side View

| Model | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| VTC-800ATC | 4500 | 4440 | 5430 | $\phi$810 | 1175 | 5500 |
| VTC-1000ATC | 4700 | 4440 | 5430 | $\phi$1000 | 1175 | 5500 |
| VTC-1200ATC | 5000 | 4440 | 5815 | $\phi$1250 | 1175 | 5500 |
| VTC-1600ATC | 5400 | 4665 | 5815 | $\phi$1600 | 1175 | 5725 |
| VTC-2000ATC | 5920 | 5240 | 6315 | $\phi$2000 | 1175 | 5925 |
| VTC-2500ATC | 6220 | 5240 | 6315 | $\phi$2500 | 1175 | 6175 |

# Specifications

| Item \ Model | VTC-650 | VTC-750 | VTC-800<br>VTC-800ATC | VTC-1000ATC | VTC-1200ATC | VTC-1600ATC | VTC-2000ATC | VTC-2500ATC |
|---|---|---|---|---|---|---|---|---|
| Max. swing diameter (mm) | ϕ720 (28.3") | ϕ850 (33.5") | ϕ1000 (39.4") | ϕ1200 (47.2") | ϕ1600 (63") | ϕ2000 (78.7") | ϕ2500 (98.4") | ϕ3000 (118.1") |
| Max. turning diameter (mm) | ϕ650 (25.6") | ϕ750 (29.5") | ϕ1000 (39.4") | ϕ1200 (47.2") | ϕ1600 (63") | ϕ2000 (78.7") | ϕ2500 (98.4") | ϕ3000 (118.1") |
| Max. Turning height (mm) | 720 (28.3") Std.<br>900 (35.4") Opt. | 650 (25.6") | 800 (31.5") | 800 (31.5") | 1250 (49.2") | 1250 (49.2") | 1600 (63") | 1600 (63") |
| * Chuck size / Work table size (mm) | * 305 (12") Std.<br>* 380 (15") Opt. | * 610 (24") | ϕ810 (31.9") | ϕ1000 (39.4") | ϕ1250 (49.2") | ϕ1600 (63") | ϕ2000 (78.7") | ϕ2500 (98.4") |
| Max. table load (kg) | - | - | 2000 (4400 lb) | 4000 (8800 lb) | 5000 (11000 lb) | 8000 (17600 lb) | 10000 (22000 lb) | 15000 (33000 lb) |
| Cross travel (X axis) (mm) | 420 (16.5") | 620 (24.4") | 870 (34.3") | 970 (38.2") | 1170 (46") | 1370 (53.9") | 1685 (66.3") | 1935 (76.2") |
| Vertical travel of ram (Z axis) (mm) | 720 (28.3") Std.<br>900 (35.4") Opt. | 800 (31.5") | 900 (35.4") | | | | 1000 (39.4") | |
| Vertical travel of cross rail (mm) | - | - | 400 (15.7") | 400 (15.7") | 800 (31.5") | 800 (31.5") | 1200 (47.2") | 1200 (47.2") |
| Spindle speed (rpm) & steps | 3000 (Std.)<br>20-1700 (Opt.)<br>Auto Hi-Lo | 20-1500<br>Auto Hi-Lo | 10-800<br>Auto Hi-Lo | 2-650 (Std.)<br>2-850 (Opt.)<br>Auto Hi-Lo | 2-350 (Std.)<br>Auto Hi-Lo | 2-250<br>Auto Hi-Lo | 2-200<br>Auto Hi-Lo | 2-200<br>Auto Hi-Lo |
| Max. spindle torque (Nm) | 841 | 3891 | 5589 | 11820 | 13988 | 24160 | 42820 | |
| Power spindle speed (Opt.) (rpm) | - | - | 2-2400 | | | | | |
| Rapid traverse (X/Zaxis) (m/min) | 12 / 20 | | 12 / 10 | | | | 10 / 10 | |
| No.of tools | Double turret:12 | Turret:V6, H10 | Turret:V6, H10<br>ATC12 (Opt.) | ATC type: 12 (Std.), 24, 40, 60 (Opt.) | | | | |
| Type of tool shank | - | - | 7 / 24 taper BT-50 | | | | | |
| Max. tool size for automatic tool changing (mm) | - | - | 355 W x 155 T x 350 L | | | | | |
| Max. tool weight (kg) | - | - | 50 (110 lb) | | | | | |
| Max. loading of ATC (kg) | - | - | 360 (792 lb) | | | | | |
| Tool change time (ATC) (sec) | - | - | 30 | | | | | |
| Square tool holder (Boring tool size) (mm) | - | - | □ 32 x □ 32<br>(ϕ60) | | | | | |
| Square section of RAM (mm) | - | - | 250 x 250 (9.8" x 9.8" ) | | | | 380 x 380 (15" x 15") | |
| * Spindle motor / Table spindle motor (kW) | 26 / 22 Std.<br>(37 / 30 Opt.) | 22 / 18.5 Std. (26 / 22 Opt.) | | 37 / 30<br>(45 / 37 Opt.) | 45 / 37 (55 / 45 Opt.) | | 55 / 45 (60 / 75 Opt.) | |
| Power spindle motor (Opt.) (kW) | - | - | 11 / 15 | | | | | |
| Servo motor (X/Z axis) (kW) | 3.0 / 3.0 | 4.0 / 4.0 | | 7.0 / 7.0 | | | | |
| CF axis motor (Opt.) (kW) | 3.0 | | | | | | 4.0 | |
| Coolant pump motor (kW) | 0.98 | | | | | | | |
| Vertical of cross rail motor (kW) | - | | 5.5 | | | 7.5 | | |
| Hydraulic motor (kW) | 3.8 | | | | | | | |
| Machine weight (kg) | 11400(25080 lb) | 13000(28600 lb) | 14000(30800 lb) | 17000(37400 lb) | 20000 (44000 lb) | 23500(51700 lb) | 30000(66000 lb) | 35500(78100 lb) |
| Dimension (L x W x H) (mm) | 3600x2500x3720<br>(141.7"x98.4"x146.5") | 3650x2350x3990<br>(143.7"x92.5"x157.1") | 4500x5500x5430<br>(177.2"x216.5"x213.8") | 4700x5500x5430<br>(185"x216.5"x213.8") | 5000x5500x5815<br>(196.9"x216.5"x228.9") | 5400x5725x5815<br>(212.6"x225.4"x228.9") | 5920x5925x6315<br>(233.1"x233.3"x248.6") | 6220x6175x6315<br>(244.9"x243.1"x248.6") |

■ All data subject to change without notice.
■ All the specifications are listed with the FANUC CNC system.

* Specifications for VTC-650 / 750

**Standard Accessories:**

1. Coolant system
2. Splash guard
3. Chip conveyor
4. Tools holders (direct mounting)
5. Tool box and various manuals

**Optional Accessories:**

1. Touch sensor
2. Tool holders (VDI & ATC type)
3. Automatic pallet changer (A. P. C.)
4. A.T. C.
5. Hydraulic chuck 3, 4, 5, 6 jaws
6. High pressure coolant through spindle

# CNC Control Specs

O: Std. △: Opt. -: Nil

| Item | Function | Specifications | SIEMENS | FANUC | | |
|---|---|---|---|---|---|---|
| | | | 810D / 840D | 18iT | 21iT | 0iTC |
| Control axes | Standard number of control axes | axes | 2 | 2 | 2 | 2 |
| | No. of simultaneously controlled axes | axes | 2 | 2 | 2 | 2 |
| Input commands | Least detection increment | 1μ | 1μ | 1μ | 1μ | 1μ |
| | Least programmable increment | 1μ | 1μ | 1μ | 1μ | 1μ |
| | Inch/metric conversion | G20/G21 | O | O | O | O |
| | Absolute/incremental command | | O | O | O | O |
| | Diameter/radius designation | | O | O | O | O |
| | ISO/EIA automatic identification | | O | O | O | O |
| | RS232-C interface | | O | O | O | O |
| Interpolation | Positioning (interpolation) | G00 | O | O | O | O |
| | Linear interpolation | G01 | O | O | O | O |
| | Circular interpolation | G02/G03 | O | O | O | O |
| | Variable lead thread cutting | | O | △ | △ | O |
| | Contineous thread cutting | | O | O | O | O |
| Program | Memory capacity | Meter | 640 | 640 | 640 | 640 |
| | No. of programs stored | | unlimited | 200 | 200 | 200 |
| | Background editing | | O | O | O | O |
| Spindle functions | S code output 4-digit BCD-binary | S4BCD | O | O | O | O |
| | Constant peripheral speed control | G96/G97 | O | O | O | O |
| | Spindle rate | % | 0-200 | 50-150 | 50-150 | 50-150 |
| Feed | Per-revolution | | O | O | O | O |
| | Per-minute | | O | O | O | O |
| | Rapid traverse rate | low25%,50%,100% | O | O | O | O |
| | Cutting speed rate | % | 0-200 | 0-200 | 0-200 | 0-200 |
| | Handle feed rate | x1,x10,x100 | O | O | O | O |
| Miscellaneous function | M-code | M2(BCD) | O | O | O | O |
| Coordinate system | Automatic coordinate system setting | | O | O | O | O |
| | Machine coordinate system | | O | O | O | O |
| | Work coordinate system | G54-G59 | O | △ | △ | O |
| | Coordinate system setting | G50 | O | O | O | O |
| | Manual reference point return | | O | O | O | O |
| | Automatic reference point return | G28/G29 | O | O | O | O |
| | 2nd reference point return | G30 | O | O | O | O |
| | Reference point return verify | G27 | O | O | O | O |
| Tool function | Tool command | T4 digit | O | O | O | O |
| | Shape/wear differentiated compensation | | O | O | O | O |
| | Nose radius compensation | G40/G41/G42 | O | O | O | O |
| | Number of offset sets | | unlimited | 16 | 16 | 64 |
| Operation | Single block | | O | O | O | O |
| | Block skip | | O | O | O | O |
| | Dry run | | O | O | O | O |
| | Machine lock | | O | O | O | O |
| | Option stop | M01 | O | O | O | O |
| | Miscellaneous function lock | M.S.T.lock | O | O | O | O |
| | Manual/Absolute ON/OFF | | O | O | O | O |
| | PLC switch | | O | O | O | O |
| Programming support function | Sub-program control | M98, M99 | O | O | O | O |
| | Corner chamfering/corner rounding | | O | O | O | O |
| | Canned cycle for drilling | G80-G89 | O | O | O | O |
| | Multiple repetitive canned cycle for lathe | G70-G79 | O | O | O | O |
| | User macro | | O | O | O | O |
| | No. of variable command sets | | unlimited | 100 | 100 | 500 |
| | Backlash compensation | | O | O | O | O |
| | Memory-type pitch error compensation | | O | O | O | O |
| | Direct drawing dimension program | | - | O | O | O |
| Measurement function | Skip function | | O | O | O | O |
| | Direct input of dffset value measured A | | O | O | O | O |
| | Automatic tool offset | | △ | △ | △ | △ |
| Safe protect | Emergency stop | | O | O | O | O |
| | Travel protection | | O | O | O | O |
| | Program protection | | O | O | O | O |
| Other | CRT | | 9.5" LCD | 10.4" LCD | 10.4" LCD | 7.2" mono LCD |
| | MDI | Full key | O | O | O | small type |
| | Languages | English/Japaness | 7 | 7 | 7 | 7 |
| | Run hour and parts count | | O | O | O | O |
| | Graphic display | | O | O | O | O |
| | Menu programming | | O | O | O | O |
| | Conversational programming with graphic | | △ | △ | △ | △ |
| | Touch sensor (tool setter) | | △ | △ | △ | △ |
| | Chinese. French. German. Italian. Spanish | | O | O | O | O |
| | Data server (HD) | | △ | △ | △ | △ |
| | Ethernet interface | | O | △ | △ | △ |

■ All data subject to change without notice.

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