

**Nidec**

All for dreams

GEAR GRINDING MACHINE

**ZE-C** SERIES



**NIDEC MACHINE TOOL CORPORATION**

[www.nidec.com/en/nidec-machinetool/](http://www.nidec.com/en/nidec-machinetool/)

# "ZERO" Target

- Zero undulation of tooth flank
- Zero waste of processing time
- Zero downtime

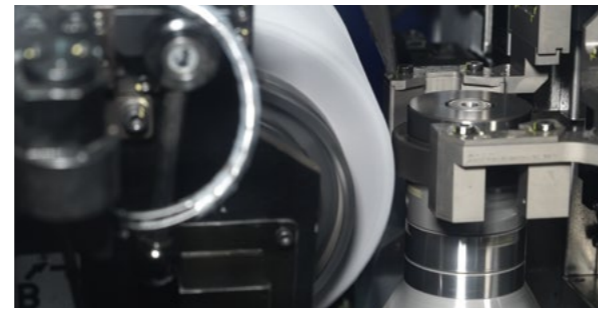
## Realization of stable high accuracy and high efficiency grinding **ZE16C/26C**

Gear Grinding Machine

Zero undulation of tooth flank

### Realization of high precision machining

- New grinding wheel head improves static rigidity by 50% and dynamic rigidity by 35% from previous models
- Nidec's in-house developed linear scale is supplied as standard, providing precision stability over time



High rigidity grinding wheel head

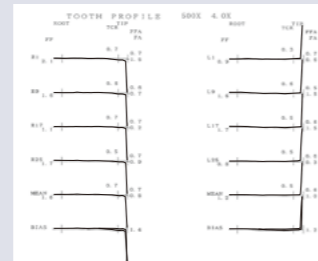
### Ground Gear Sample

**Gear Spec.**  
 Module: 3.0  
 O.D: 105 mm **4.1 in**  
 N.T.: 31  
 T.W: 40 mm **1.6 in**  
 H.A: 20 degree  
 Grinding stock on OBD: 0.5 mm **0.02 in**

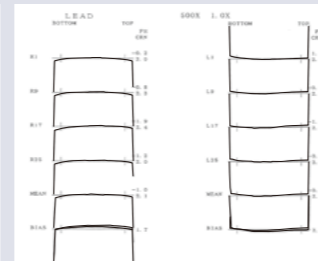
**Grinding Condition**  
 Grinding wheel with 3 threads  
 2 passes (climb/conventional)  
 Grinding wheel speed 4,700 min<sup>-1</sup>



**Cycle time 49.5 seconds:**  
 Grinding time 43.5 seconds  
 Non-grinding time 6.0 seconds exclusive of dressing time



On tooth profile JIS N 0 class achieved



On tooth lead JIS N 1 class achieved

Zero waste of processing time

### Achieving high efficiency grinding

- High speed direct drive grinding wheel spindle and direct drive work table
- ZE16C/26C grinding wheel 6,000min<sup>-1</sup> → 8,000min<sup>-1</sup>
- ZE16C table 1,500min<sup>-1</sup> → 3,000min<sup>-1</sup>
- ZE26C table 600min<sup>-1</sup> → 2,000min<sup>-1</sup>
- Simultaneous shift grinding on the same tooth flank is possible
- Achieving a non-grinding time of 6 seconds with high speed auto-meshing and ring loader
- Extended dressing interval through the use of 160 mm **6.3 in** wide grinding wheels

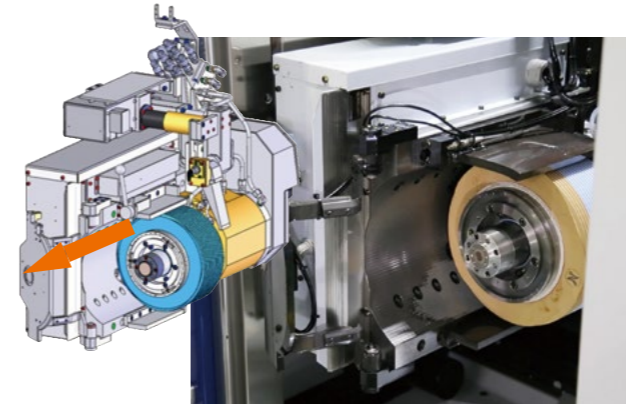


Newly developed auto-meshing

Zero downtime

### Improved maintainability

- Changing the grinding wheel is easily accomplished with excellent accessibility

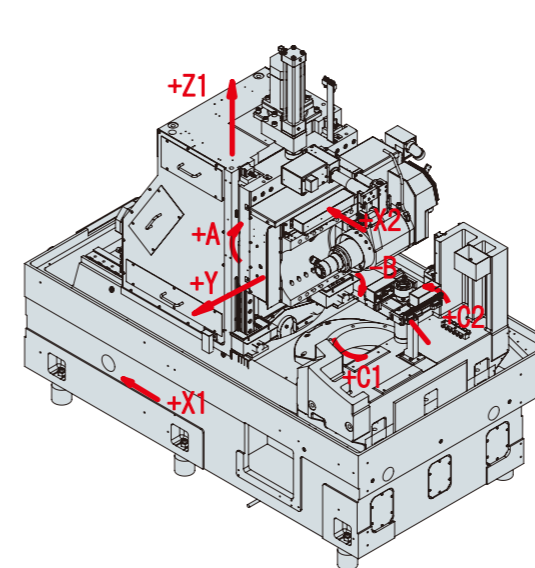


Open state of the grinding wheel guard when replacing the grinding wheel

- The main control panel swivels for easy access and small footprint

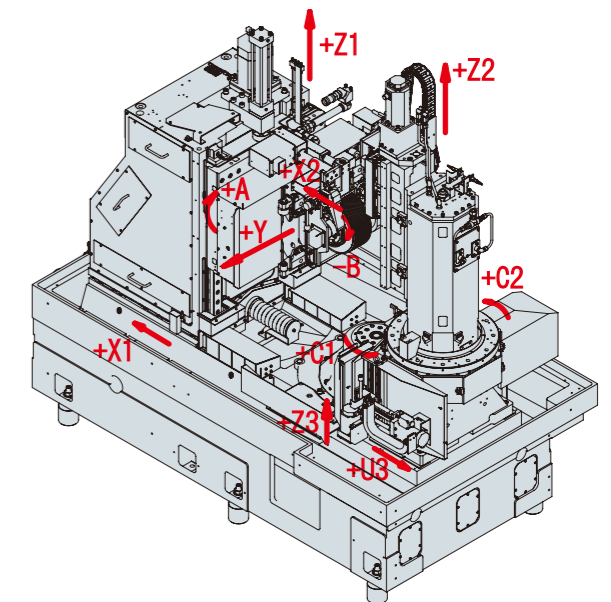


### NC control axis



ZE16CNC 10-axes NC control

No.	Axis	Description
1	X1	Radial feed
2	Y	Grinding wheel shift
3	Z1	Axial feed (opt.)
4	X2	Coolant nozzle
5	U3	Auto-mashing
6	A	Wheel head swivel
7	B	Wheel rotation
8	C1	Table rotation
9	C2	Work chager swivel
10	C3	Dresser swivel (opt.)

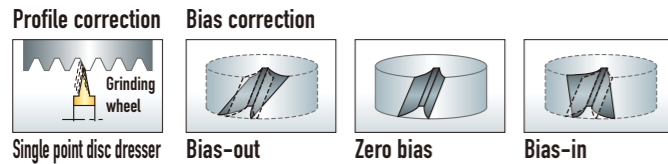


ZE26C 12-axes NC control

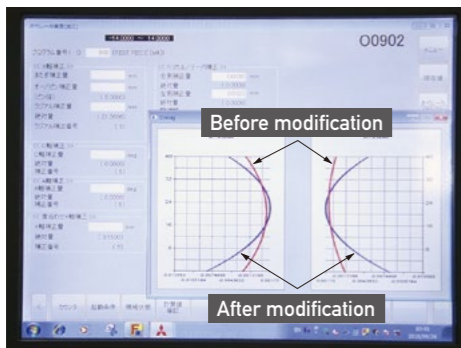
No.	Axis	Description
1	X1	Radial feed
2	Y	Grinding wheel shift
3	Z1	Axial feed (opt.)
4	X2	Coolant nozzle
5	Z2	NC tailstock (opt.)
6	Z3	Auto-mashing (opt.)
7	U3	Auto-mashing
8	A	Wheel head swivel
9	B	Wheel rotation
10	C1	Table rotation
11	C2	Ring roader swivel
12	C3	Dresser swivel (opt.)

## Easy User interface

- Correction input for tooth profile, tooth lead, and bias is possible on operation screen.
- With the use of single point dressers, contour dressing with full involute modifications is available (optional).
- Bias control for helical gears is available (optional).
- Cycloid tooth profile can be ground.



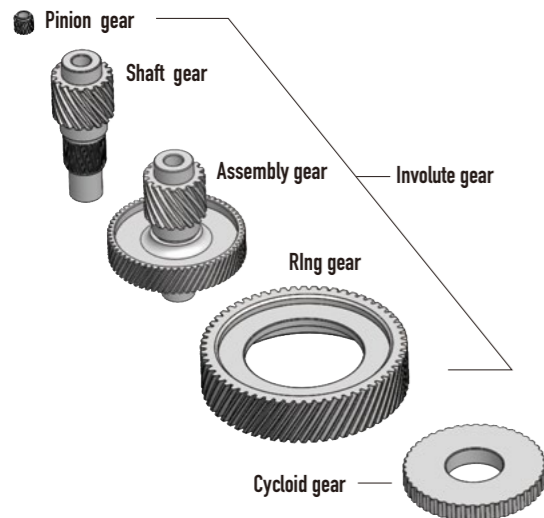
- On screen displays show modifications before and after inputs



Operation screen

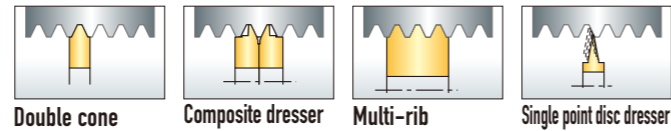
## Customer support in parts application

- We provide application engineering including wheel selection and grinding technology for the full range of cylindrical gear grinding.



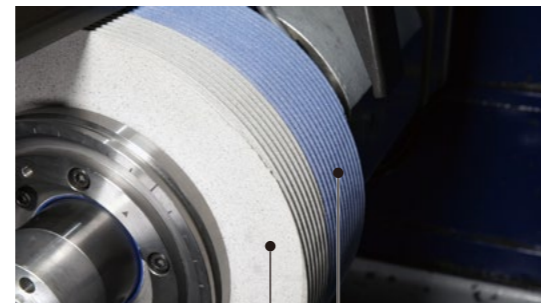
## Enhanced dressing functions

Automated dresser supports a variety of dressing tools.



## Wide grinding wheel width for polish grinding

- Polishing grinding is performed with a composite wheel with grinding and polishing sections



Superfinishing type grinding wheel      Standard type grinding wheel

## Customer support in automation

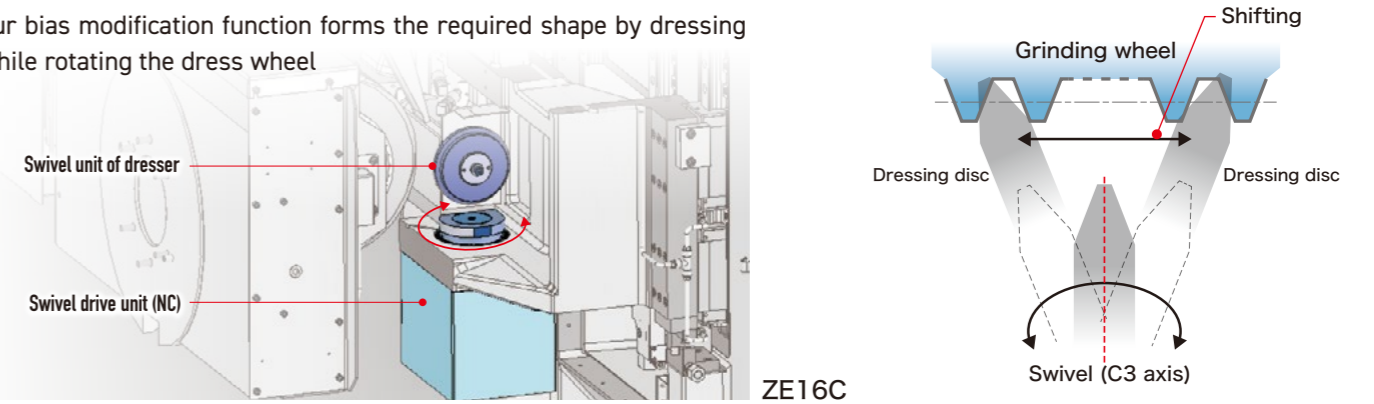
- Proven fully integrated automation systems according to customer's request.



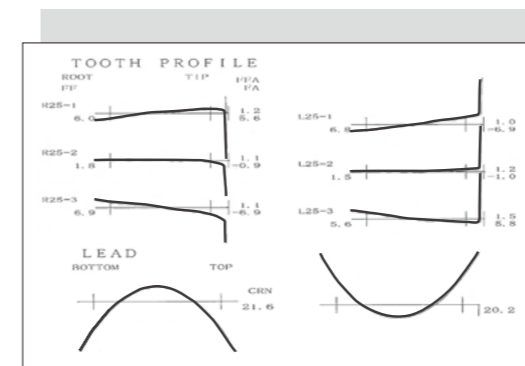
## Double flank bias control function

### ◆ Swivel unit of dresser

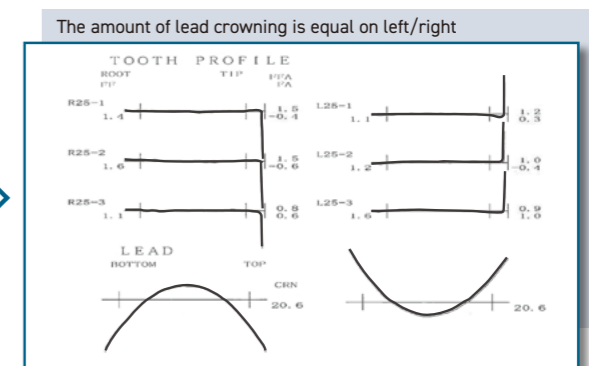
- Our bias modification function forms the required shape by dressing while rotating the dress wheel



### ■ Natural bias (twist)



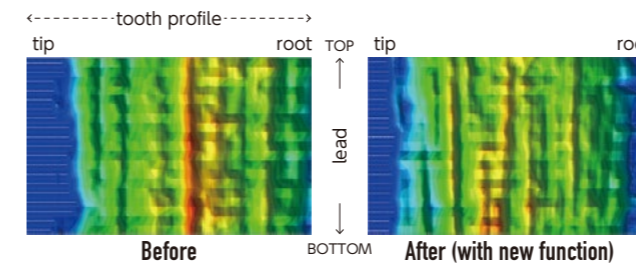
### ■ Double flank bias modification



## New functions for reduction of gear noise

### ◆ Low noise grinding technology

Our in-house developed dressing/machining methods reduce periodic irregularities on the tooth profile for quieter mesh.



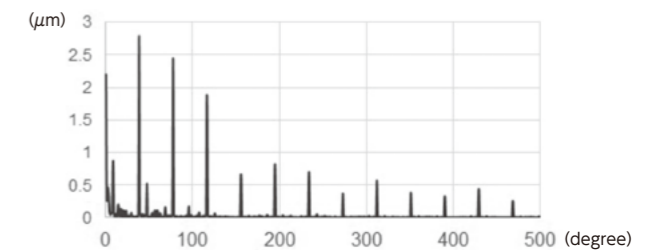
### ◆ Closed-loop system

Closed-loop system for the automatic correction by using gear measurement data. Prevents mistakes, reduces operator work load.



### ◆ Tooth profile analysis

Based on the all tooth profile measurement data, we perform fourier analysis to identify the frequency component of tooth profile waviness.



### ◆ Various optional functions

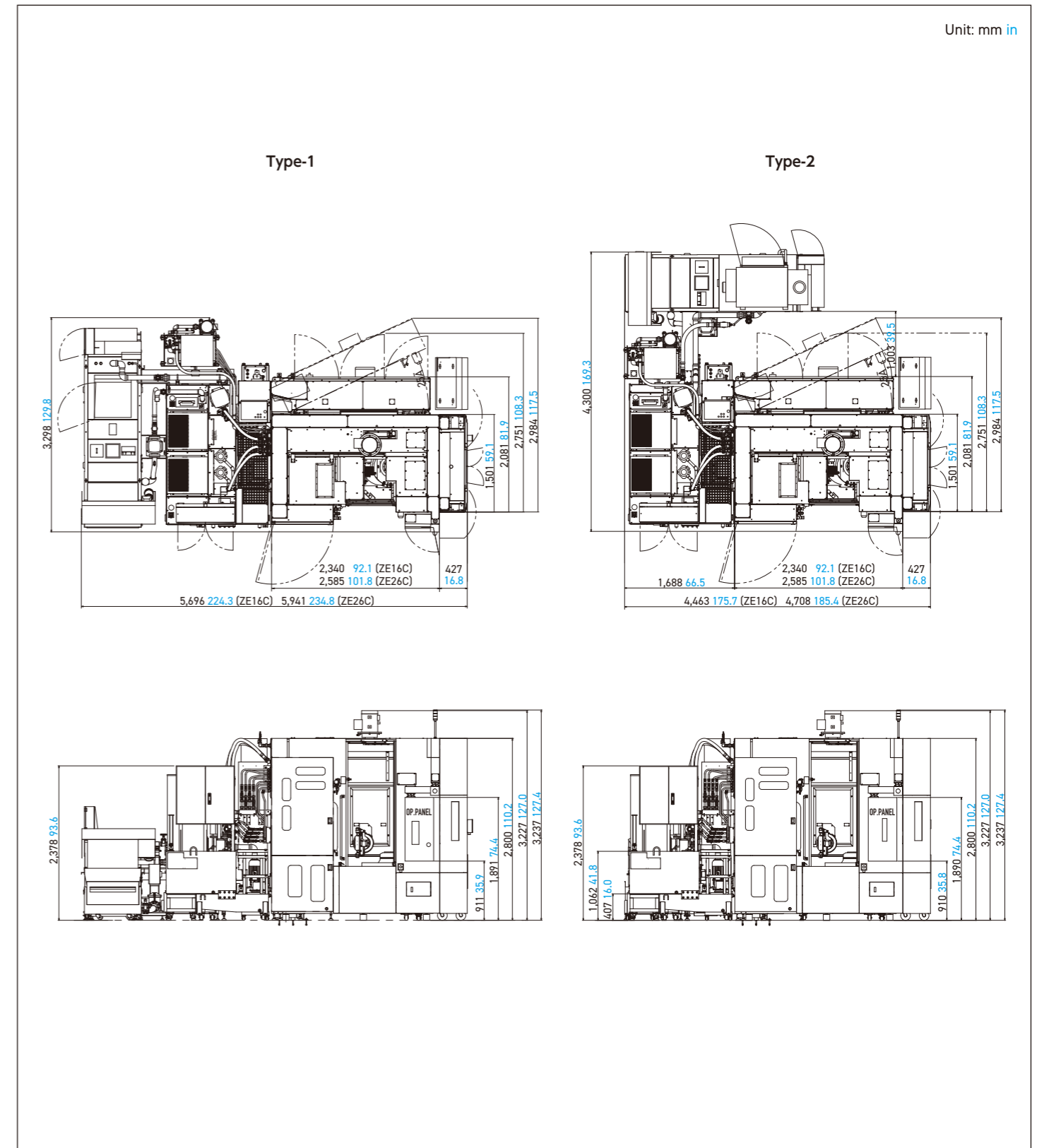
- Comprehensive simulation function
- Improvement of tool life per dress of grinding wheel by special Nidec shifting technology
- Improvement of dressing intervals by unique wheel dressing and shifting during double flank bias grinding.

Machine Specifications

Item		ZE16C	ZE26C
Part	Max. O.D.	mm in $\phi 20 - 160$ $\phi 0.8 - 6.3$	$\phi 20 - 260$ $\phi 0.8 - 10.2$
	Module <b>Diametral pitch</b>	1 - 4 <b>25.4 - 6.35</b> (opt. 0.5 - 1.0 <b>50.8 - 25.4</b> )	1 - 6 <b>25.4 - 4.23</b> (opt. 0.5 - <b>50.8 -</b> )
	Max. workpiece length (Subject to workpiece and / or tooling design)	mm in 200 <b>7.9</b> (in auto-loading) 600 <b>23.6</b> (in manual loading)	350 <b>13.8</b> (in auto-loading) 600 <b>23.6</b> (in manual loading)
	Max. workpiece face width (Subject to workpiece and / or tooling design)	mm in 200 <b>7.9</b> (in auto-loading) 250 <b>9.8</b> (in manual loading)	250 <b>9.8</b>
	Number of teeth	5 - 1000	
	Max. rotation speed	min <sup>-1</sup> 3,000	2,000
Wheel	Max. wheel O.D.	mm in $\phi 275$ $\phi 10.8$ (opt. $\phi 300$ $\phi 11.8$ )	
	Min. wheel O.D.	mm in $\phi 208$ $\phi 8.2$	
	Width	mm in 160 <b>6.3</b> (opt. 125 <b>4.9</b> )	
	Wheel I.D.	mm in $\phi 160$ $\phi 6.3$	
	No. of thread	1 - 7	
	Max. rotation speed	min <sup>-1</sup> 8,000	
Dresser	Dresser type*	Composite (in-house)	Composite (in-house) or Fassler type
	Drive system	Hydraulic up/down	Ring loader
	O.D.	mm in $\phi 110 - 160$ $\phi 4.3 - 6.3$	
	Max. rotation speed	min <sup>-1</sup> 6,000	
Grinding wheel head rotation (A axis)		deg. $\pm 45$	
Axial feed stroke (Z axis)		mm in 295 <b>11.6</b>	
Grinding wheel axis shift (Y axis)		mm in 235 <b>9.3</b>	
Number of control axis		9	11
NC system		FANUC	
Main motor capacity		kW HP 30 <b>40</b>	
Total power consumption		kVA 100	110
Machine weight		ton lb 13.0 <b>28,700</b>	15.5 <b>34,200</b>

\*ZE16C available with in-house composite dresser only  
ZE26C available with either in-house composite dresser or Fassler type

Machine Dimensions



Standard Equipment

- Control panel bracket
- Hydraulic equipment
- Coolant tank
- Cookant gun
- Air equipment
- Lubrication equipment
- Mist collector
- Work clamp unit
- Meshing equipment
- Work changer (ZE16C)/Ring loader (ZE26C)
- Work light
- Coolant nozzle
- Dressing equipment
- Wheel flange
- Name plate
- Standard tool

- NC unit
- Memory card (for data back up)
- Tool counter
- Ethernet
- Power outlet (100V 1A)
- Lock out with emergency stop
- Machine status indicator lamp
- Spindle load meter

Options

- Work grip unit
- Gripper
- Fixed part temporary table (ZE16C)
- Work lifter
- Splash cover (loading area)
- Tail stock (hydraulic/ZE16C)
- Tail stock (NC/ZE26C)
- Automatic fire extinguisher
- Paint color
- Test cutting
- Fixture/Master work piece
- Grinding wheel
- Dressing wheel
- Wheel lifter
- Automatic power shut-off device
- Power failure protection device
- Quality check counter
- Auto door



Inquiry

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Machine specifications such as dimensions etc., are fixed using SI units including the metric system.  
In case data are shown in other units in blue, such as inches, pounds and gallons etc. they are for reference only and the formal data  
in black supersedes any equivalent data given in blue when fractions caused by conversion become an issue.  
Specifications are subject to change without prior notice.  
The export of this product is subject to Japanese Governmental approval.