# CNC Barwork Turning Center

# BX-Series

## Sales Manual


2nd Edition

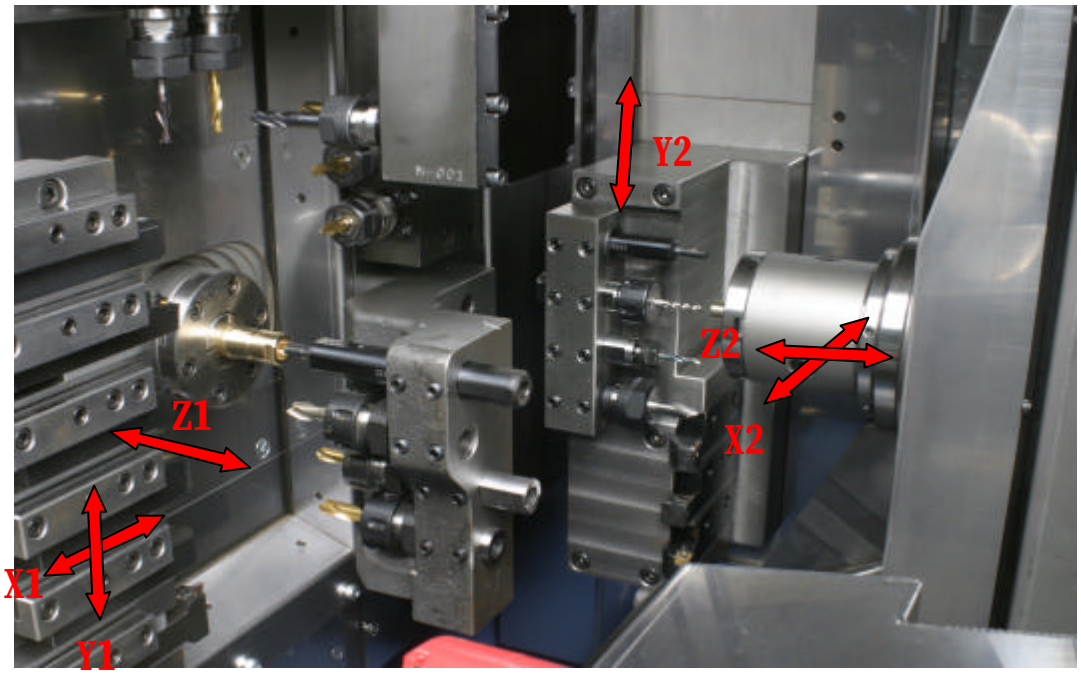
Aug-2005

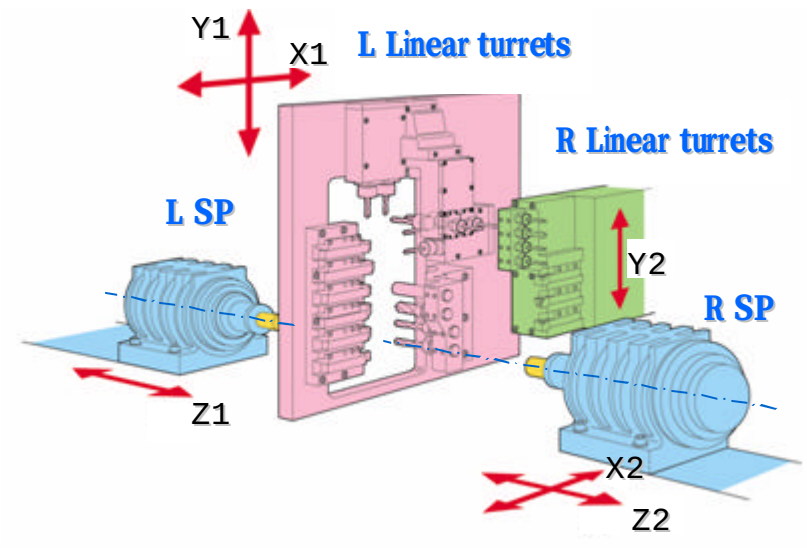
# *Main Feature*

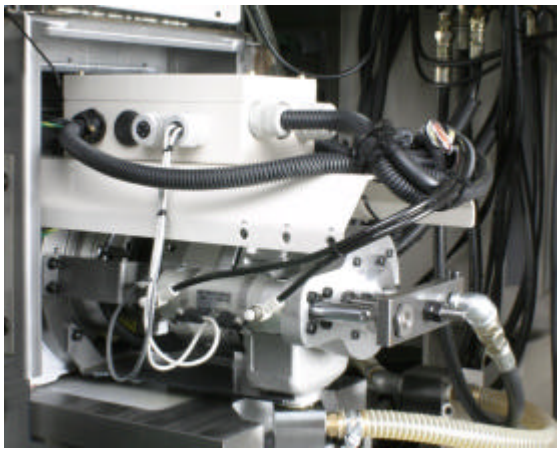
## ** Simultaneous machining operation*

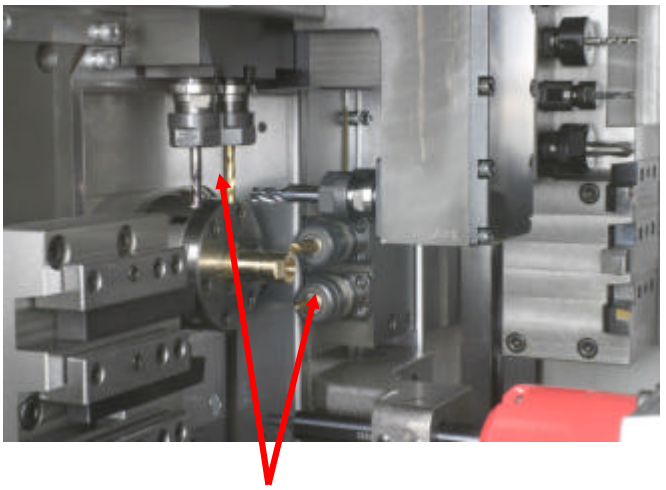
**BX series feature traversable No.2-spindle (R-SP) with 2-axis movement "X" and "Z" which combined with linear type turret enables simultaneous front and backside machining operations.**

**The cutting cycle has been reduced by 35 ~ 50% compared to twin spindle and single turret**



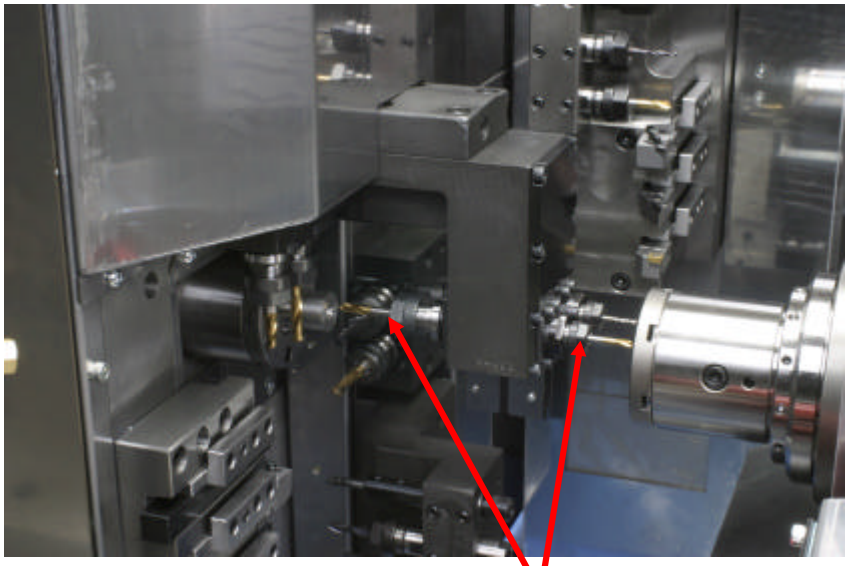







**Built-in Motor for Sub Spindle**

**X-Spindle unit**



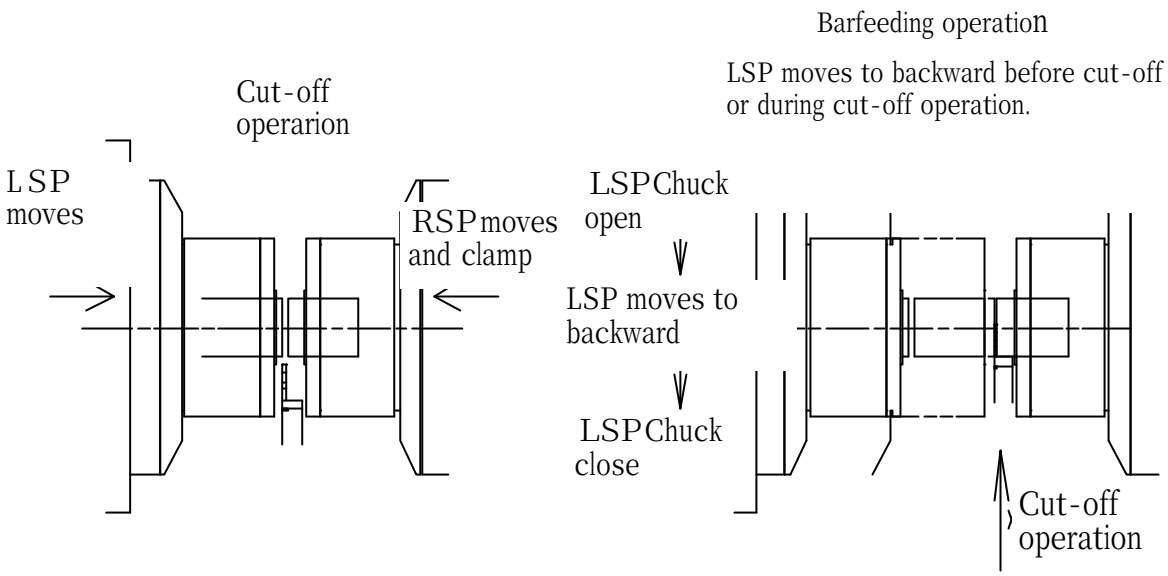
**Double Z-Spindle**

## ** Rigidity & Less Idle time*

**The built-in spindle motors of L and R-spindle (3.7/2.2kW) provide fastest possible acceleration and deceleration times, and possible heavy machining operation by adoption of a high rigidity linear guide.**
**Rapid feed of all axis are 24m/min provide reduce idle time.**

# * Reduce Bar feeding Time

**BX series performs bar feeding operation during cut-off operation.**




# * 3D Tooling

**Linear turret system ensures fast tool setting and promotes easier programming with minimum idle of slide movement, also ensure uninterrupted cutting chip flow.**

# * *Easy Set-up of Tools Offset*

## 1) In case of O.D. tools (L-slide)

```
TOOL SETTING                                                    HD－1
                                                                VER: 1.00
   WORK SIZE          =    26.000
     (D= 8.000 - 26.000 mm)

                        X-AXIS_1  X-AXIS_2    Y-AXIS
   TOOL TO SPINDLE  =   164.000   135.000   250.000
      (TOOL BASE — SPINDLE CENTER)
   TOOL             =    20.000    35.000    35.000

   CUT-OFF          =    30.000   NOT USED  NOT USED

   APPROACH SHIFT   =     1.000     1.000     1.000

       G100 : TOOL SET POS.(T1-T6): T_ G100; (MDI)
       G101 : TOOL SET POS. ESCAPE: G101;    (MDI)
       G102 : CUT-OFF APPROACH POS. (X AXIS)
       G103 : TOOL APPROACH POS.X_1 (X AXIS_1)
       G104 : TOOL APPROACH POS.X_2 (X AXIS_2)
       G105 : TOOL APPROACH POS.Y   (Y AXIS)
NUM= >^

| | CONDIT | | | OFFSET GEOMET | OFFSET WEAR | | | | | | |
```

a. Input the diameter of material, the length of tools and cut-off tools from holder on TOOL SETTING SCREEN.

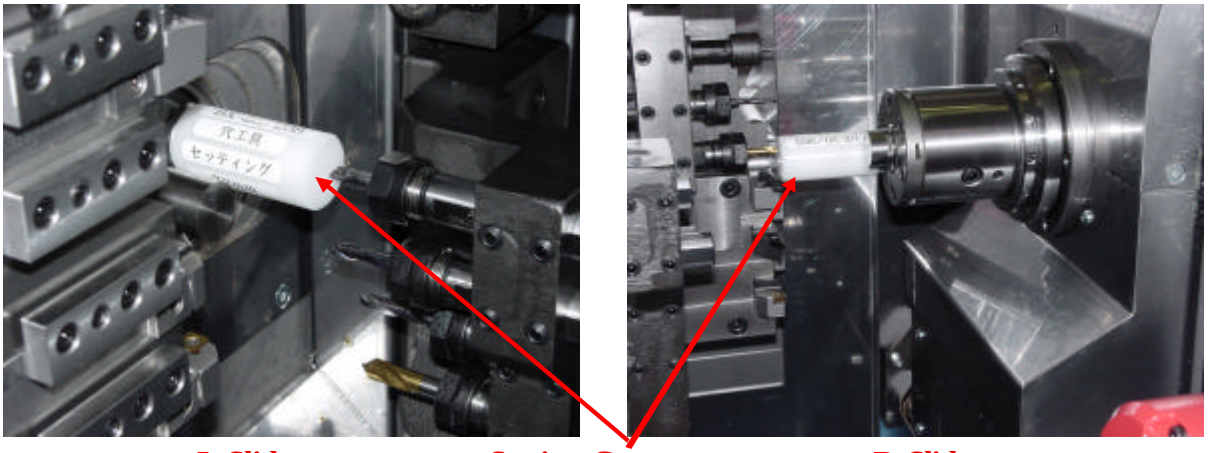
b. Input [T1G100] in MDI mode, and press [CYCLE START] button. Slide will be moved automatically to cut-off position.

c. Clamp tools after touching to material.

d. Input [X26.0] and press [MEASURE] button. Amount X-104.0 will be registered into offset of T1.

## 2) Incase of drill & I.D. tools

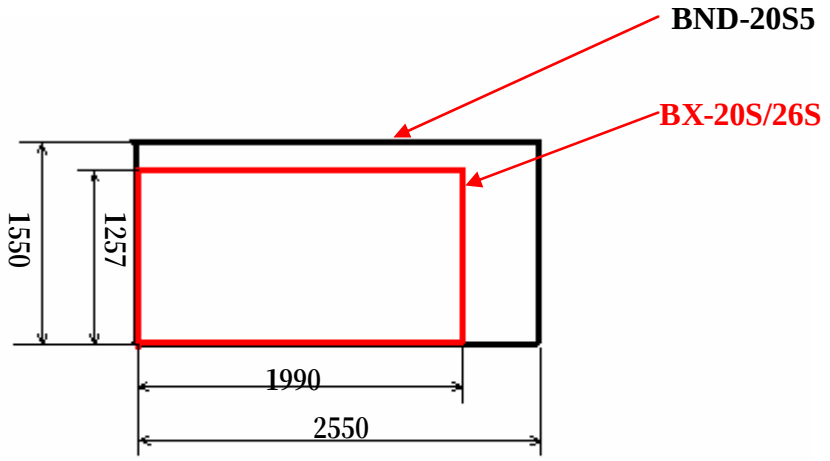
Press [MEASURE] button after a tool touches to setting gauge.



L-Slide　　Setting Gauge　　R-Slide

## *Saving Floor Space

**1,257 x 1,990 mm (without chip conveyor)**




## * Manual Handle Retrace Function (Option)

**New job program movement can be easily checked by using manual retrace function to avoid any interference of tool & a workpiece. Manual retrace can use forward movement with manual pulse generator.**

**Notice:**

**It will not be operated correctly if reversing movement after reading waiting M-code.**

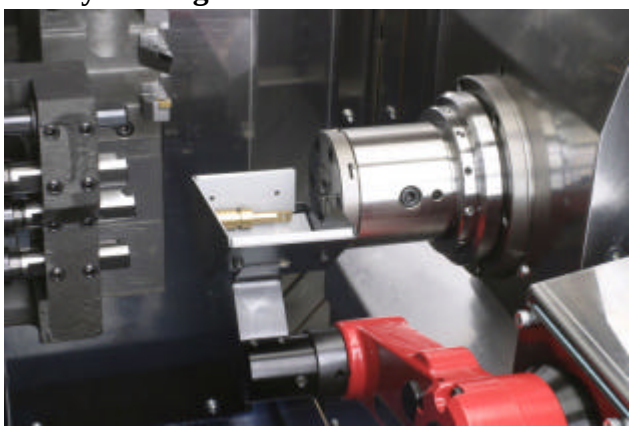
# * *Optional Accessories*

## 1. Cut-off Confirmation

**Newly developed electrical cut-off confirmation system can be detected whether cut-off operation has been done.**

## 2. Parts Catcher & Conveyor

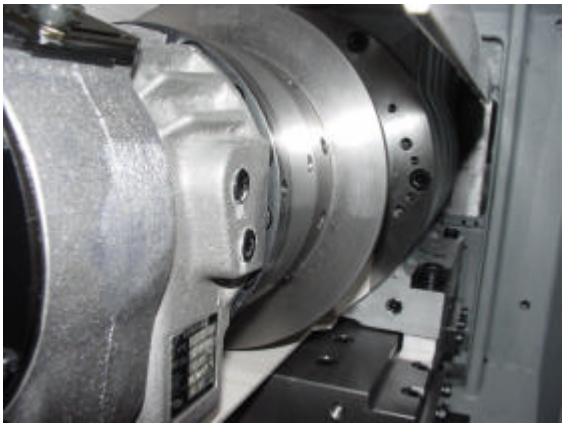
**Parts catcher receives the finished a workpiece ejected by sub spindle. And conveyor brings out of machine.**




**Parts Catcher** **Parts Conveyor**

## 3. Disk Brake for L-Spindle

**Disk brake system provides high griping force on spindle for milling operation.**



## 4. High Pressure Coolant

**One GRUNDFOS's pump provides high pressure coolant for L, R-Slide and R-Spindle inner coolant. Maximum pressure is about 1MPa (11 Kgf/cm2) and pressure of coolant holds 1MPa even if it discharges coolant by 3 points.**

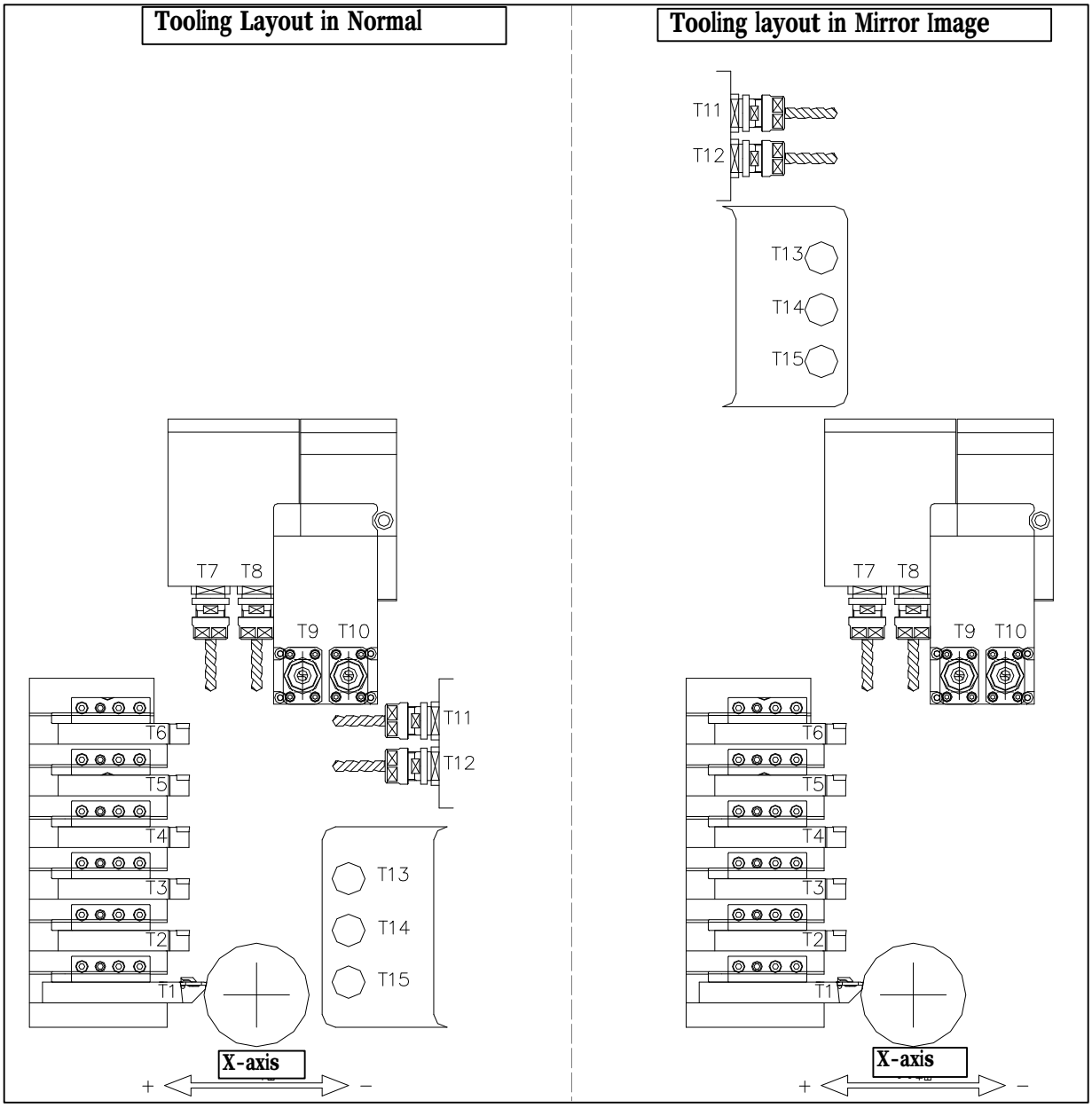
## 5. Long Shaft System

**Enables efficient processing of precision, small-diameter long shaft bar work on a single machine, which used to require multiple machines.**

# Mirror Image Function

## Explanations

Mirror image can be applied to X-axis with G code.
X-axis sign is reversed from the programmed command.



**Format**

G68 : Mirror Image ON
G69 : Mirror Image cancel

**Examples**

| Mirror Image OFF | Mirror Image ON |
|---|---|
| O7777 | O7777 |
| T0000 | T0000 |
| | **G69** |
| G28 X0 | G28X0 |
| T0303 | T0303 |
| G00 X20.0 | G00 X20.0 |
| G01 X40.0 F100 | G01 X40.0 F100 |
| | **G68** |
| T1313 | T1313 |
| **G01 X-20. F100 --- Sign is reversed** | **G01 X20. F100** |
| **G0 X-40. --- Sign is reversed** | **G0 X40.** |
| X0 | X0 |
| | **G69** |
| T0000 | T0000 |
| M30 | M30 |

**Notice:**

1) ***When automatic operation is stopped in mirror image effective, please cancel the mirror image mode by MDI mode (G69).***

# Machine Specification

| Item | | | | Unit | BX20/26 |
|---|---|---|---|---|---|
| Machining Capacity | Max. Turning Dia. | | | mm | φ20 / φ26 |
| | Max. Turning Length (Long Shaft) | | | mm | 67 (255) |
| Spindle | No. of Spindle | | | | 2 |
| | Speed Range | L-SP | | $min^{-1}$ | 80-8000 |
| | | R-SP | | $min^{-1}$ | 80-8000 |
| | Bearing I.D. | L-SP | | mm | φ80 |
| | | R-SP | | mm | φ80 |
| | Closing Tube I.D. | L-SP | | mm | φ28 |
| | | R-SP | | mm | φ28 |
| Turret | No. of Turret | | | | 2 |
| | Type of Turret | Slide Unit No.1 | | | Linear Type |
| | | Slide Unit No.2 | | | Linear Type |
| | No. of Tools | No of Tools Incl. Driven Tools | Slide No.1 | pce | 18 |
| | | | Slide No.2 | pce | 7 |
| | | OD Tools(LSP) | Slide No.1 | pce | 6 |
| | | ID Tools(LSP) | Slide No.2 | pce | 3 |
| | | OD Tools(LSP) | Slide No.1 | pce | 4 |
| | | ID Tools(LSP) | Slide No.2 | pce | 4 |
| | Size of Tools | OD Tools | Slide No.1 | mm | □16 |
| | | | Slide No.2 | mm | □16 |
| | | ID Tools | Slide No.1 | mm | φ20 |
| | | | Slide No.2 | mm | φ20 |
| | Machining Capacity | Drill (L-SP) | | mm | φ12 |
| | | Tap (L-SP) | | mm | M8 |
| | | Drill (R-SP) | | mm | φ12 |
| | | Tap (R-SP) | | mm | M8 |
| | | Type of Collet | | | ER16 |
| Driven Tools | No. of Tools | Slide Unit No.1 | | pce | X4 + Z4 (Total 8) |
| | | Slide Unit No.2 | | pce | |
| | Capacity | Slide Unit No.1 | Drill | mm | φ8 |
| | | | Tap | mm | M6 |
| | | | Speed Range | $min^{-1}$ | 100-4000 |
| | | | Type of Collet | | ER16 |

# Machine Specification

| Item | | | | Unit | BX20/26 |
|---|---|---|---|---|---|
| Slide | Type of Slide | Slide No.1 | X1 | | Linear Guide |
| | | | Y1 | | Linear Guide |
| | | L-SP | Z1 | | Linear Guide |
| | | Slide No.2 | Y2 | | Linear Guide |
| | | R-SP | X2 | | Linear Guide |
| | | | Z2 | | Linear Guide |
| | Stroke | Slide No.1 | X1 | mm | 135 |
| | | | Y1 | mm | 260 |
| | | L-SP | Z1 | mm | 70 |
| | | Slide No.2 | Y2 | mm | 215 |
| | | R-SP | X2 | mm | 180 |
| | | | Z2 | mm | 238 |
| | Rapid Feed | Slide No.1 | X1 | m/min | 24 |
| | | | Y1 | m/min | 24 |
| | | L-SP | Z1 | m/min | 24 |
| | | Slide No.2 | Y2 | m/min | 24 |
| | | R-SP | X2 | m/min | 24 |
| | | | Z2 | m/min | 24 |
| | Force | Slide No.1 | X1 | N | 1847 |
| | | | Y1 | N | 3325 |
| | | L-SP | Z1 | N | 1847 |
| | | Slide No.2 | Y2 | N | 3325 |
| | | R-SP | X2 | N | 1847 |
| | | | Z2 | N | 1847 |

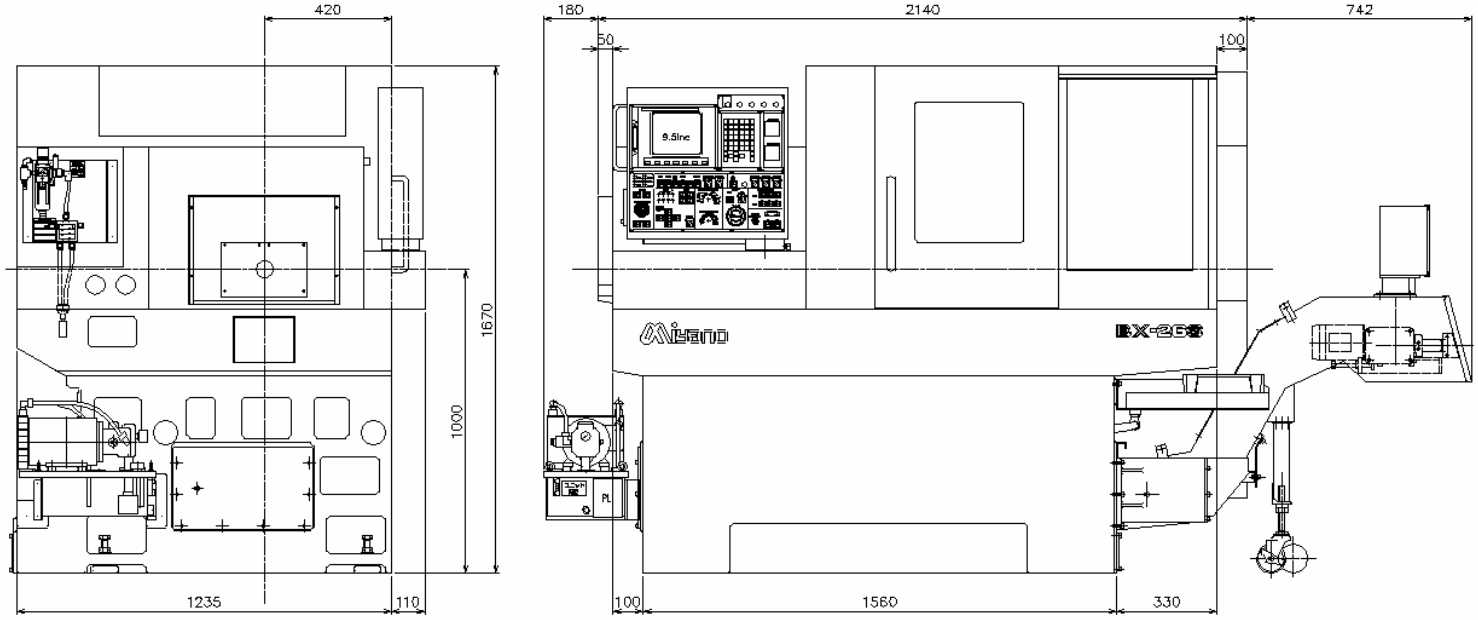
# Machine Specification

| | | | | | |
|---|---|---|---|---|---|
| Motor | Spindle Motor (Built-in) | L-SP | | kw | 3.7/2.2 |
| | | R-SP | | kw | 3.7/2.2 |
| | Axis Motor | Slide No.1 | X1 | kw | 0.5 |
| | | | Y1 | kw | 0.75 |
| | | L-SP | Z1 | kw | 0.5 |
| | | Slide No.2 | Y2 | kw | 0.75 |
| | | R-SP | X2 | kw | 0.5 |
| | | | Z2 | kw | 0.5 |
| | Driven Tools motor | Slide Unit No.1 | | kw | 0.5 |
| | | | | kw | 0.5 |
| | Hydraulic Pump Motor | | | kw | 0.75 |
| | Coolant Pump Motor | | | kw | 0.25 |
| | High Pressure Coolant Pump Motor | | | kw | 0.85 |
| | Lubrication Motor | | | kw | |
| Tank Capacity | Hydraulic Oil | | | L | 10 |
| | Coolant Oil | | | L | 140 |
| | Lubrication Oil | | | L | |
| Power Source | Required Power Capacity | | | KVA | 20 |
| | Required Power Supply | | | V/Hz | AC200/220 50/60 |
| | Required Fuse Capacity | | | A | 60 |
| | Required Compressed Air | | | Mpa | 0.5 |
| M/C Dimension | Spindle Height from Floor | | | mm | 1000 |
| | Height | | | mm | 1670 |
| | Floor Size (with Chip Conveyor) | | L | mm | 2220 (3060) |
| | | | W | mm | 1305 |
| | Weight | | | kg | 3000 |
| NC | FANUC | | | | 18i-TB (2-Channel) |

**Note:**
**The specifications are subject to change without notice.**

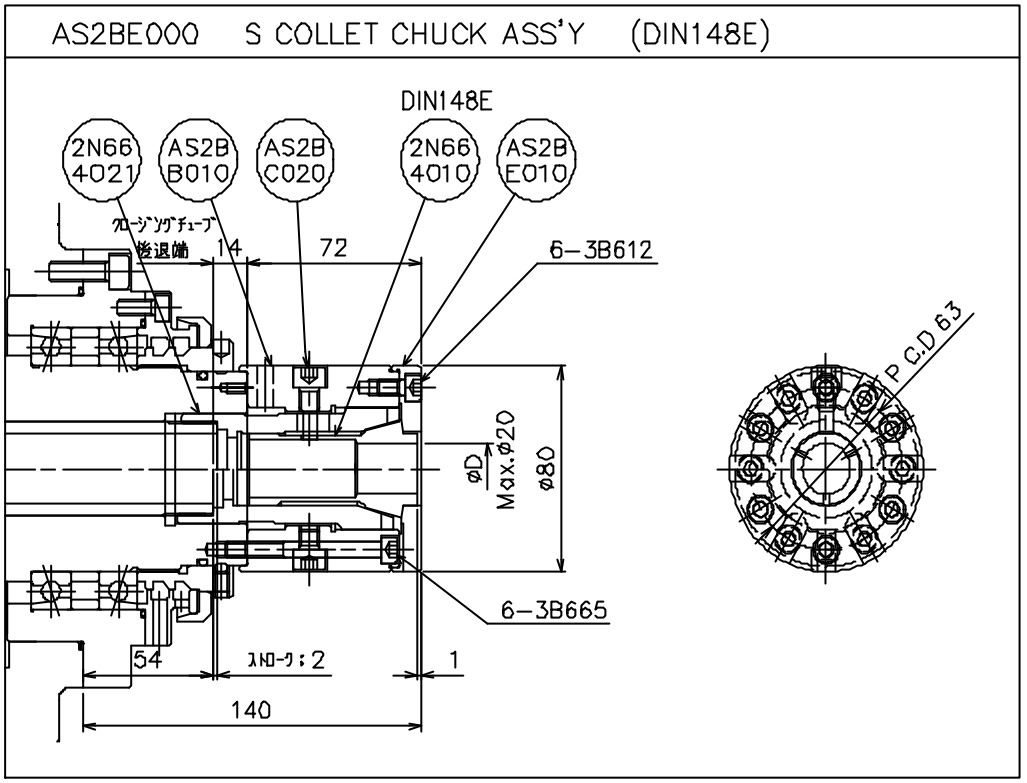
# *External View*

## BX-20/26S

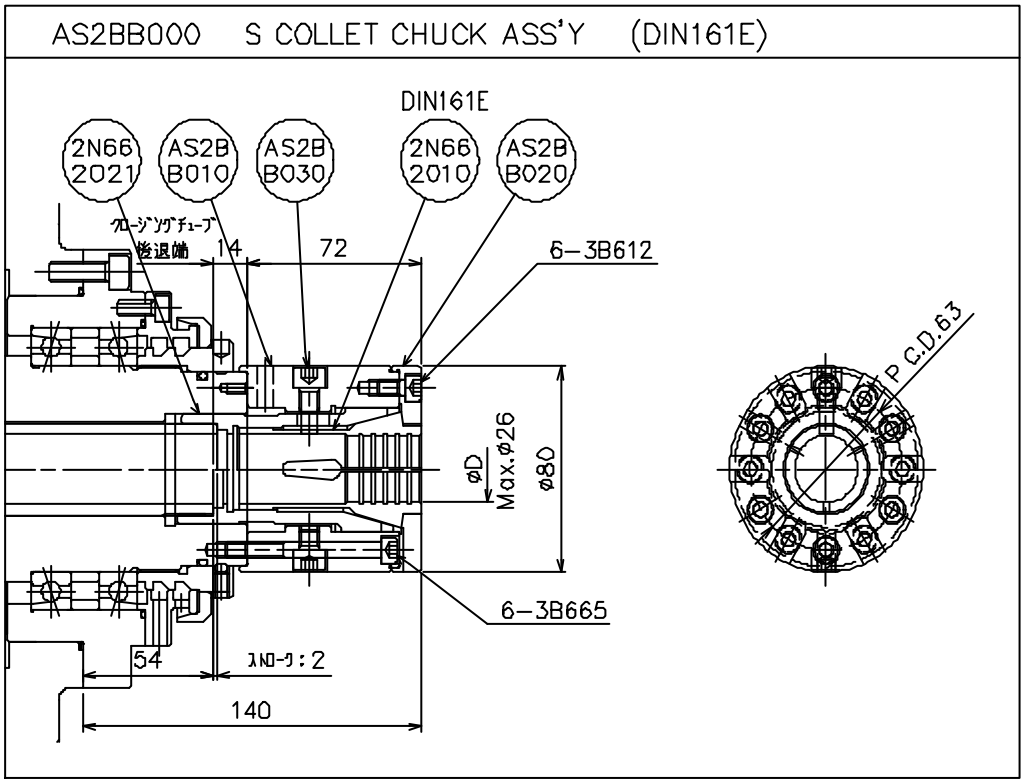


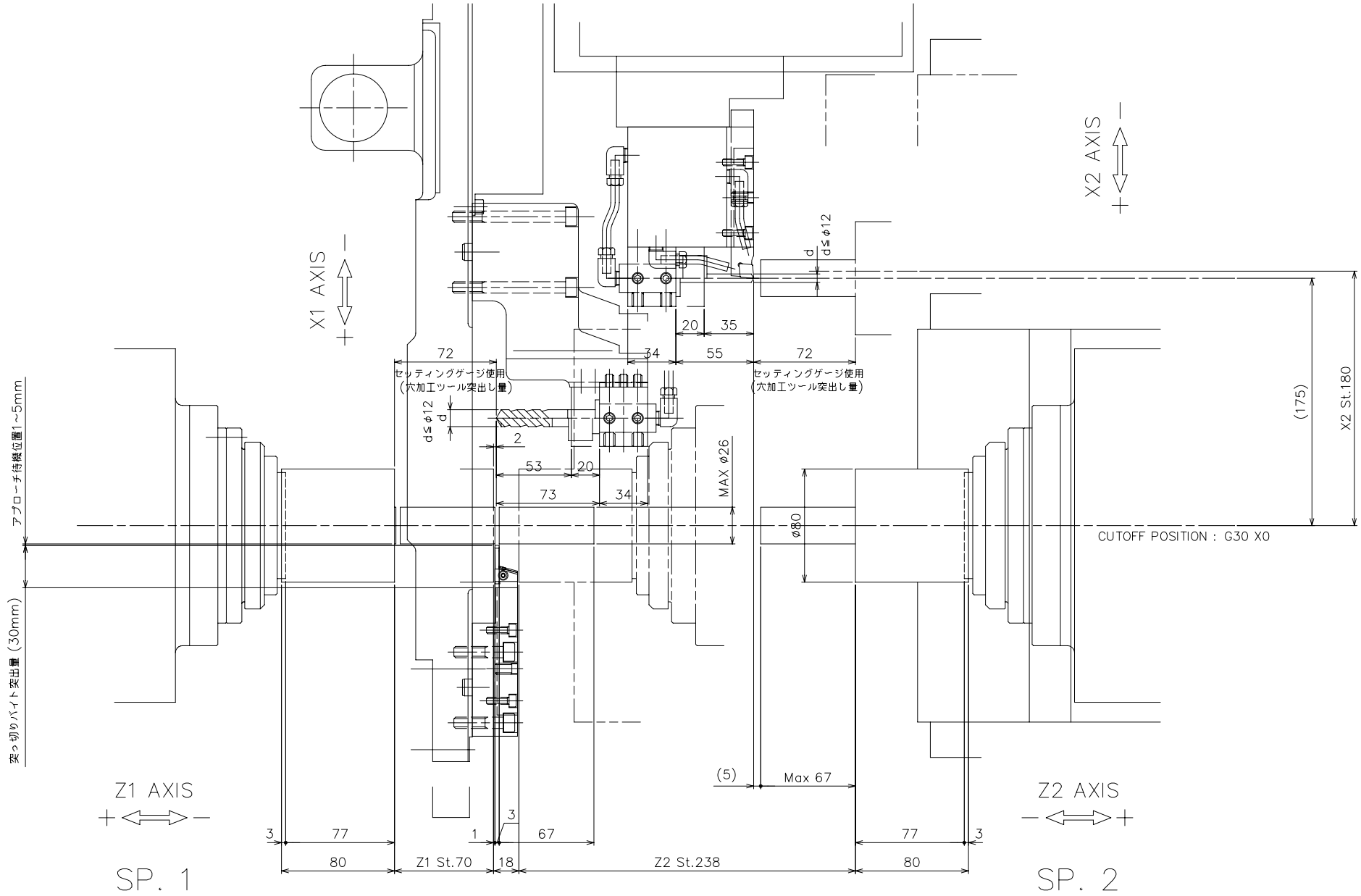
# * Collet Chuck System (L & R-Spindle)

## BX-20S (DIN148E)




## BX-26S (DIN161E)






| REVISIONS | COMMON TOLERANCE (MIDDLE CLASS) | | ROUGHNESS OF SURFACE FINISH UNLESS OTHERWISE NOTED: | | FINISH PROCESS |
|---|---|---|---|---|---|
| NO. | 6MAX | ±0.1 | ▽▽▽▽ | 0.1S ~ 0.8S | HEAT TREATMENT |
| NO. | 6 TO 30MAX | ±0.2 | ▽▽▽ | 0.8S ~ 6.3S | SURFACE HARDENING |
| NO. | 30 TO 120MAX | ±0.3 | ▽▽ | 6.3S ~ 25S | HARDNESS |
| 1 01/25/05 NO.054M015 EXCH. | 120 TO 315MAX | ±0.5 | ▽ | 25S ~ 100S | PAINTING |
| Miyano | 315 TO 1000MAX | ±0.8 | | | |
| | 1000 TO 2000MAX | ±1.2 | | | |

| PART NUMBER | PART NAME | MATERIAL | REMARKS | NO.REQ | Ea. UNIT |
|---|---|---|---|---|---|
| | | | | | |

| TYPE: | SCALE | | APP.BY | CHKD.BY | CHKD.BY | DSGN.BY | DWG.BY |
|---|---|---|---|---|---|---|---|
| BX-20/26S | | A2 1:2 | | | | 01/13/05 TSUKADA | 01/13/05 TSUKADA |

| TITLE: | | |
|---|---|---|
| TOOLING SYSTEM (mm) | PT. NO. | 4M780002 |
| | DWG.NO. | 4M78000A |

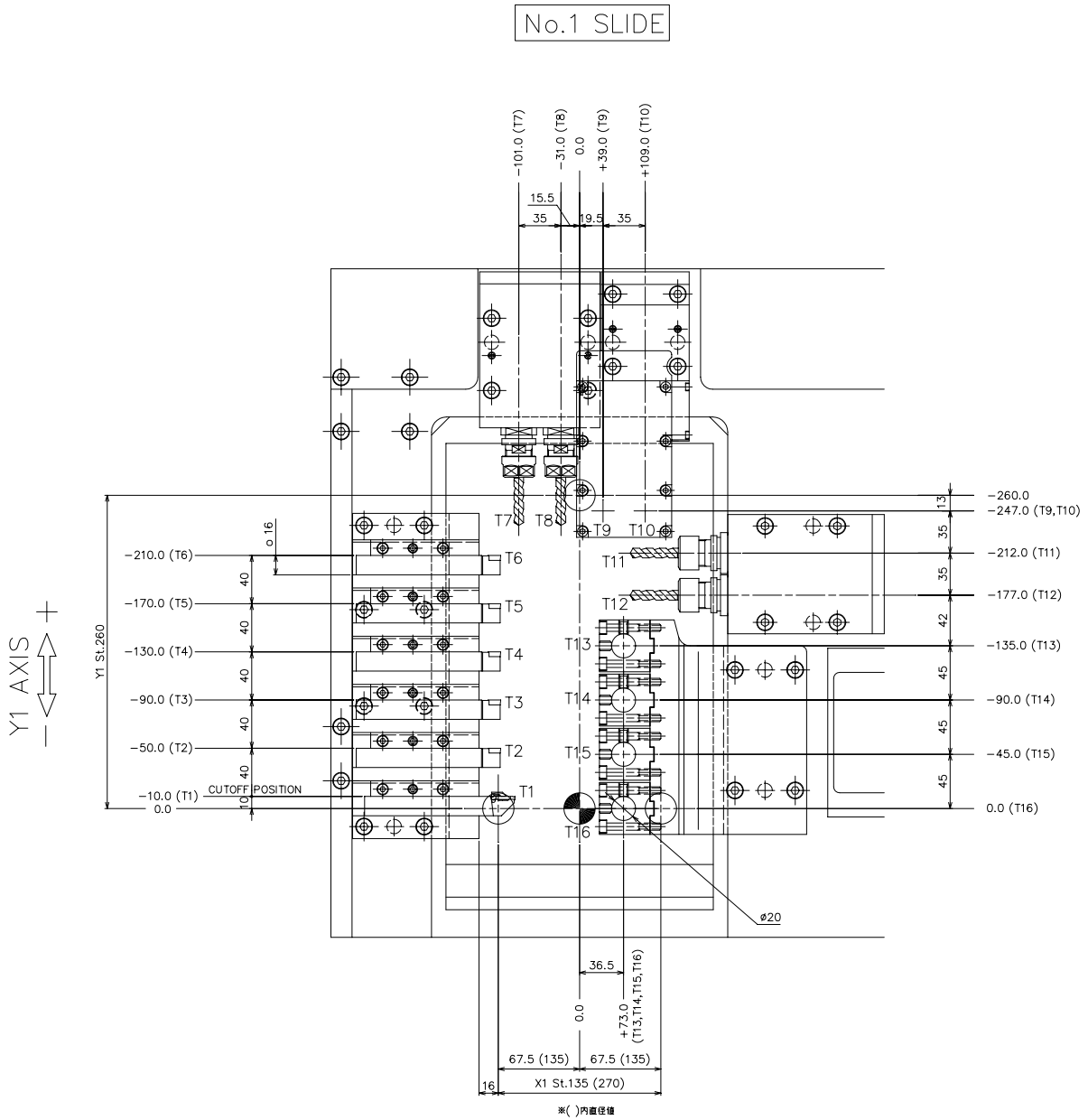
1 / 1

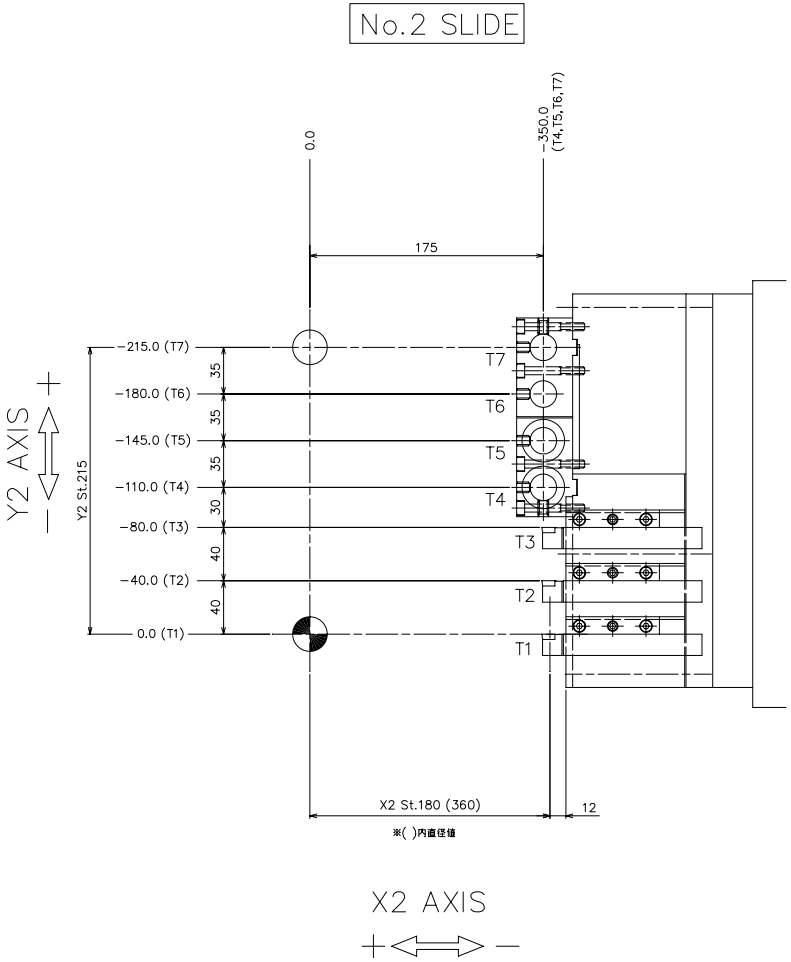
ツール仕様

- バイトシャンク ： □16
- スリーブ ： φ20
- 穴明工具 ： Max φ12
- タップサイズ ： Max M8

回転工具ツール仕様

- コレットサイズ ： AR16
- 穴明工具 ： Max φ8
- タップサイズ ： Max M6




| REVISIONS | | |
|---|---|---|
| | NO. | |
| | NO. | |
| | NO. | |
| 1 | 01/25/05 | NO.054M015 EXCH. |

Miyano

| COMMON TOLERANCE (MIDDLE CLASS) | |
|---|---|
| 6MAX | ±0.1 |
| 6 TO 30MAX | ±0.2 |
| 30 TO 120MAX | ±0.3 |
| 120 TO 315MAX | ±0.5 |
| 315 TO 1000MAX | ±0.8 |
| 1000 TO 2000MAX | ±1.2 |

| ROUGHNESS OF SURFACE FINISH UNLESS OTHERWISE NOTED: | |
|---|---|
| ▽▽▽▽ | 0.1S ~ 0.8S |
| ▽▽▽ | 0.8S ~ 6.3S |
| ▽▽ | 6.3S ~ 25S |
| ▽ | 25S ~ 100S |

FINISH PROCESS
HEAT TREATMENT
SURFACE HARDENING
HARDNESS
PAINTING

| PART NUMBER | PART NAME | MATERIAL | REMARKS | NO.REQ | Ea. UNIT |
|---|---|---|---|---|---|

| TYPE: | SCALE | APP.BY | CHKD.BY | CHKD.BY | DSGN.BY | DWG.BY |
|---|---|---|---|---|---|---|
| BX-20/26S | A1 1:2 | | | | 01/13/05 TSUKADA | 01/13/05 TSUKADA |

TITLE: Standard Type
TOOLING SYSTEM (mm)

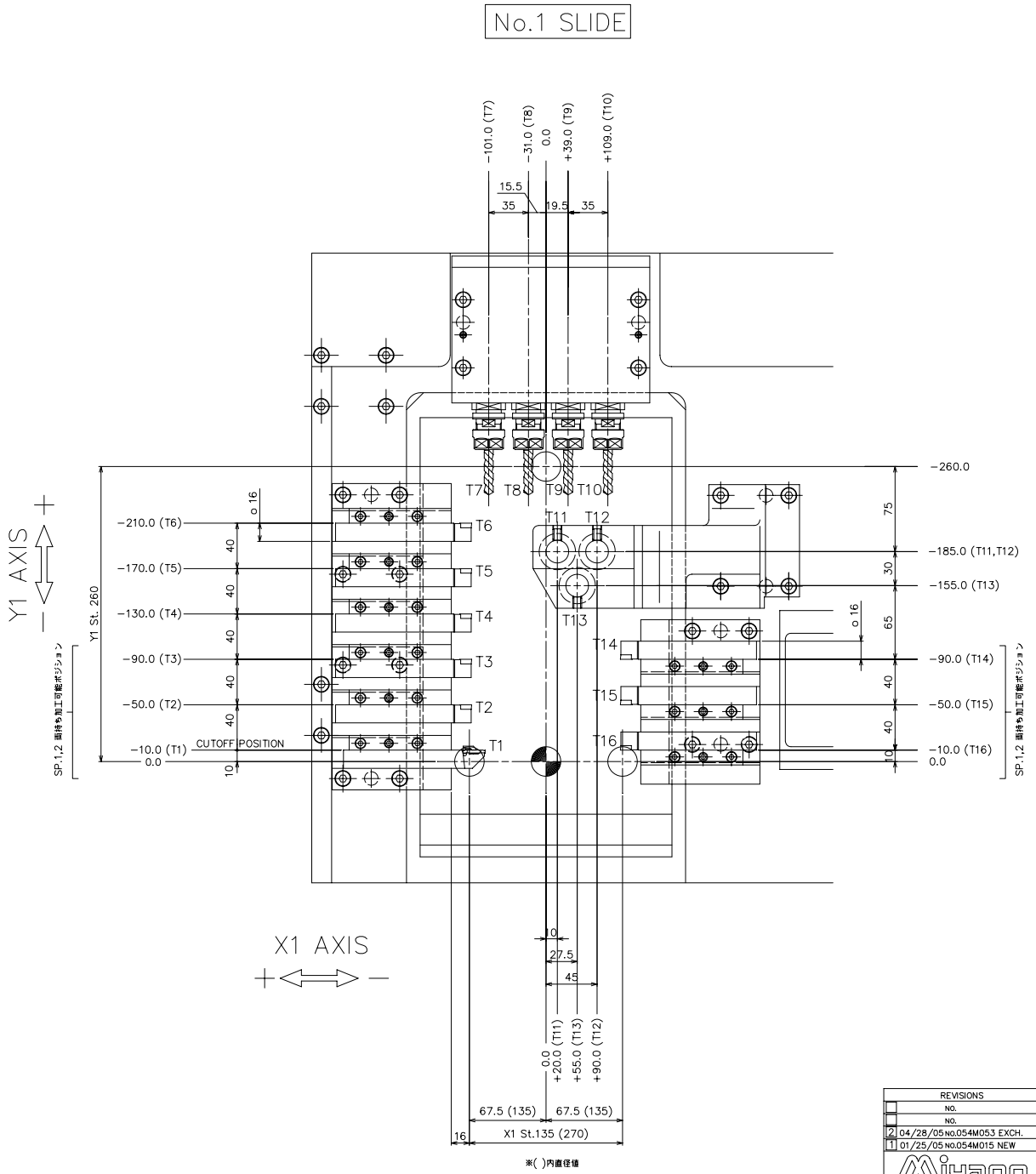
PT. NO. 4M780002
DWG.NO. 4M78000C

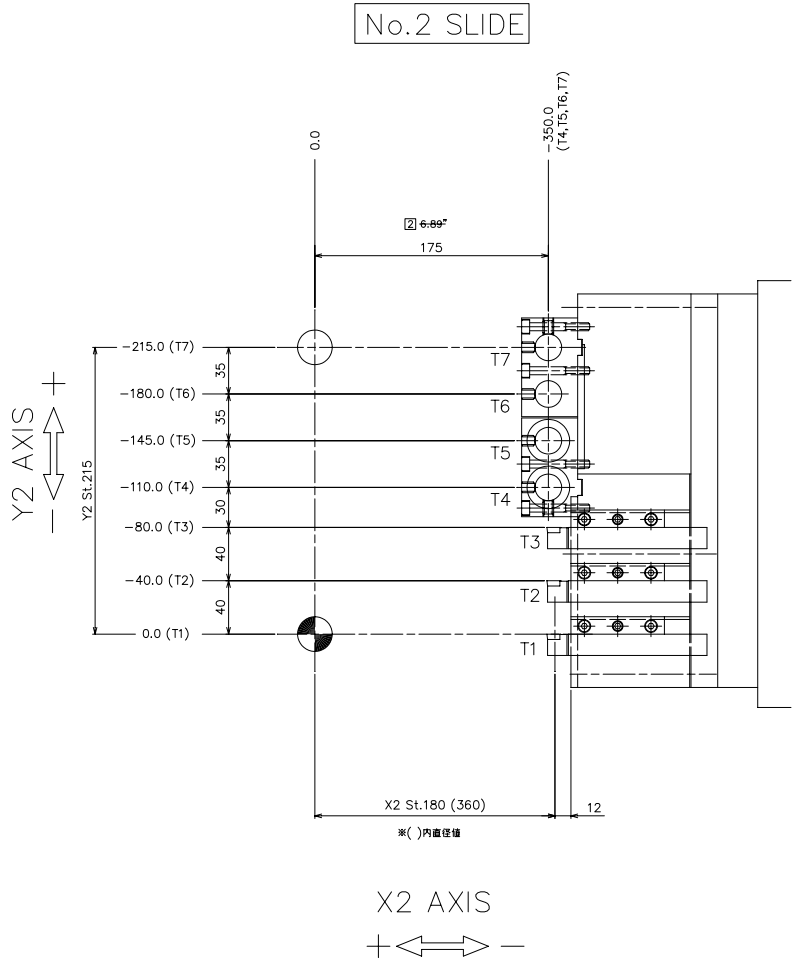
ツール仕様

- バイトシャンク ： □16
- スリーブ ： φ20
- 穴明工具 ： Max φ12
- タップサイズ ： Max M8

回転工具ツール仕様

- コレットサイズ ： AR16
- 穴明工具 ： Max φ8
- タップサイズ ： Max M6




| REVISIONS | | |
|---|---|---|
| | NO. | |
| | NO. | |
| 2 | 04/28/05 | NO.054M053 EXCH. |
| 1 | 01/25/05 | NO.054M015 NEW |

Aiyano

| COMMON TOLERANCE (MIDDLE CLASS) | |
|---|---|
| 6MAX | ±0.1 |
| 6 TO 30MAX | ±0.2 |
| 30 TO 120MAX | ±0.3 |
| 120 TO 315MAX | ±0.5 |
| 315 TO 1000MAX | ±0.8 |
| 1000 TO 2000MAX | ±1.2 |

| ROUGHNESS OF SURFACE FINISH UNLESS OTHERWISE NOTED: | |
|---|---|
| ▽▽▽▽ | 0.1S ~ 0.8S |
| ▽▽▽ | 0.8S ~ 6.3S |
| ▽▽ | 6.3S ~ 25S |
| ▽ | 25S ~ 100S |

| FINISH PROCESS | |
|---|---|
| HEAT TREATMENT | |
| SURFACE HARDENING | |
| HARDNESS | |
| PAINTING | |

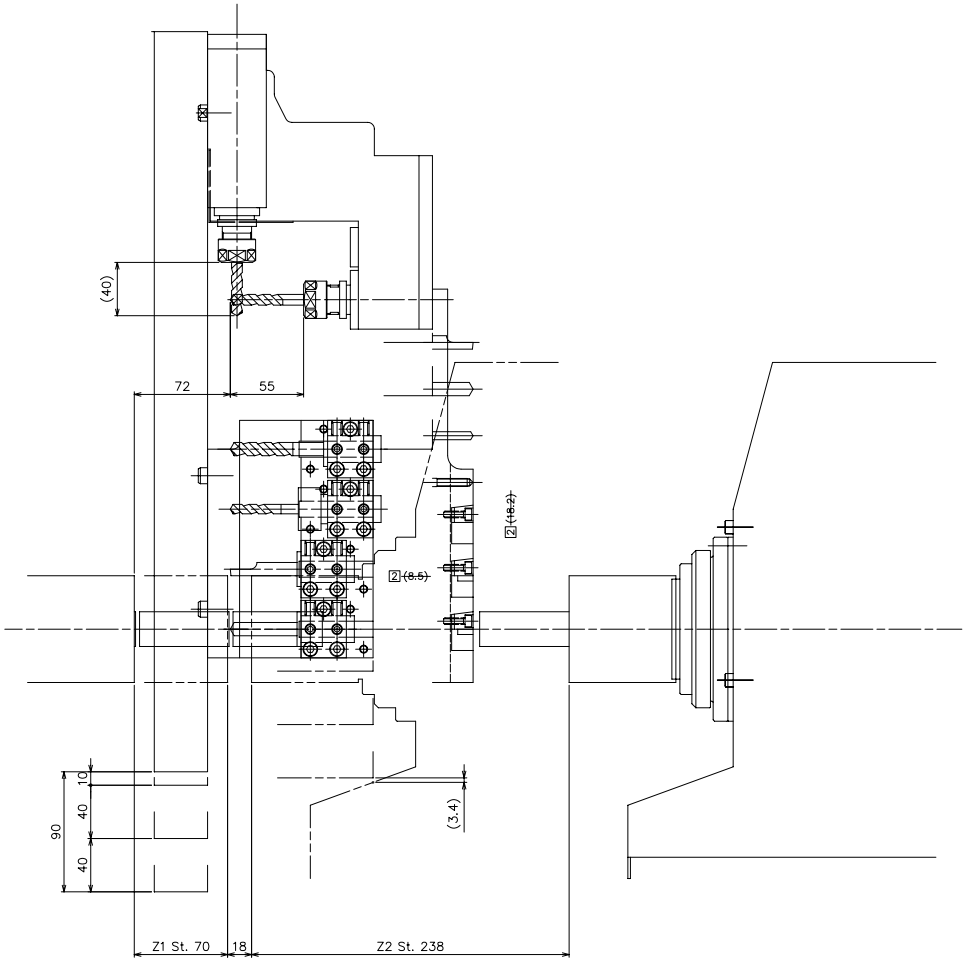
| PART NUMBER | PART NAME | MATERIAL | REMARKS | NO.REQ | Ea. UNIT |
|---|---|---|---|---|---|
| | | | | | |

| TYPE: | SCALE | | APP.BY | CHKD.BY | CHKD.BY | DSGN.BY | DWG.BY |
|---|---|---|---|---|---|---|---|
| BX-20/26S | | A1 1:2 | | | | 01/13/05 TSUKADA | 01/24/05 TSUKADA |

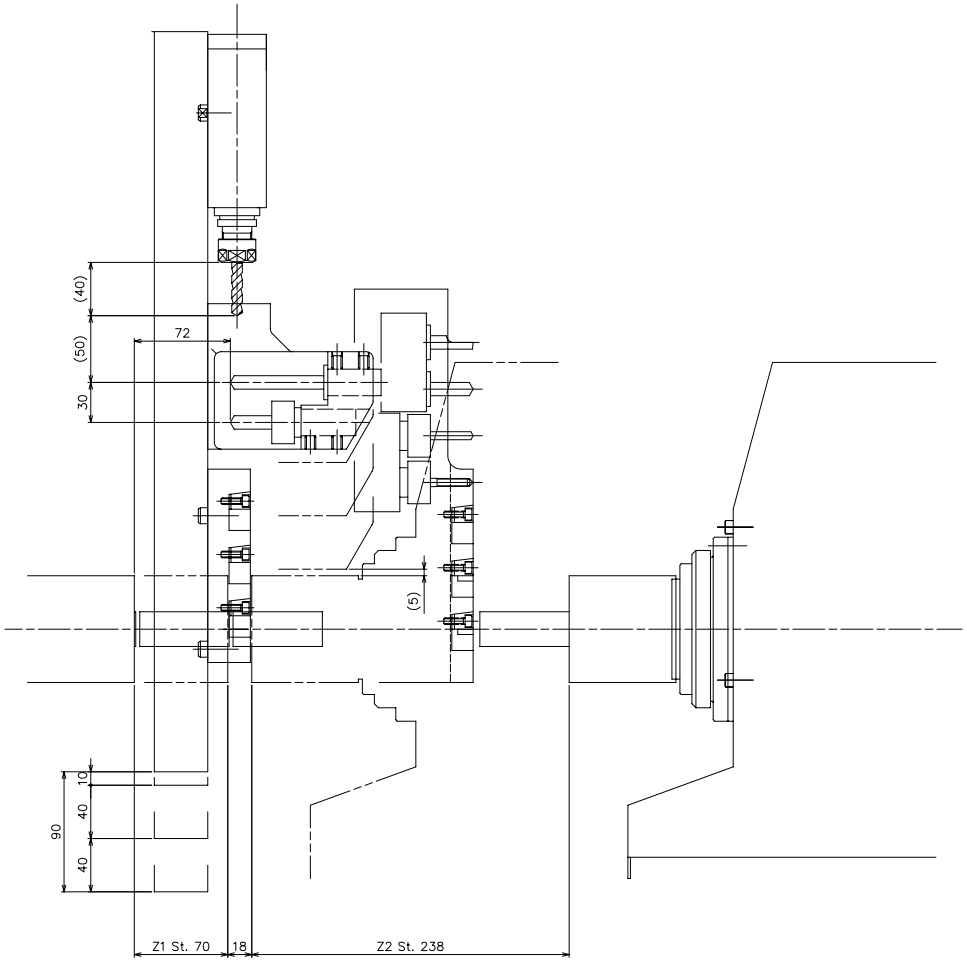
TITLE: Long Shaft Type
TOOLING SYSTEM (mm)

PT. NO. 4M780002
DWG.NO. 4M78000D

## Standard Type




## Long Shaft Type




| REVISIONS | | |
|---|---|---|
| NO. | | |
| NO. | | |
| 2 | 04/28/05 | NO.054M053 EXCH. |
| 1 | 01/25/05 | NO.054M015 EXCH. |

Miyano

| COMMON TOLERANCE (MIDDLE CLASS) | |
|---|---|
| 6MAX | ±0.1 |
| 6 TO 30MAX | ±0.2 |
| 30 TO 120MAX | ±0.3 |
| 120 TO 315MAX | ±0.5 |
| 315 TO 1000MAX | ±0.8 |
| 1000 TO 2000MAX | ±1.2 |

| ROUGHNESS OF SURFACE FINISH UNLESS OTHERWISE NOTED: | |
|---|---|
| ▽▽▽▽ | 0.1S ~ 0.8S |
| ▽▽▽ | 0.8S ~ 6.3S |
| ▽▽ | 6.3S ~ 25S |
| ▽ | 25S ~ 100S |

| FINISH PROCESS |
|---|
| HEAT TREATMENT |
| SURFACE HARDENING |
| HARDNESS |
| PAINTING |

| PART NUMBER | PART NAME | MATERIAL | REMARKS | NO.REQ | Ea. UNIT |
|---|---|---|---|---|---|

| TYPE: | SCALE | | APP.BY | CHKD.BY | CHKD.BY | DSGN.BY | DWG.BY |
|---|---|---|---|---|---|---|---|
| BX-20/26S | | A1 1:2 | | | | 01/13/05 TSUKADA | 04/26/05 TSUKADA |

TITLE: TOOLING SYSTEM (mm)

PT. NO. 4M78000Z

DWG.NO. 4M78000B

NOTE 1: Break all corners and edges unless otherwise specified.

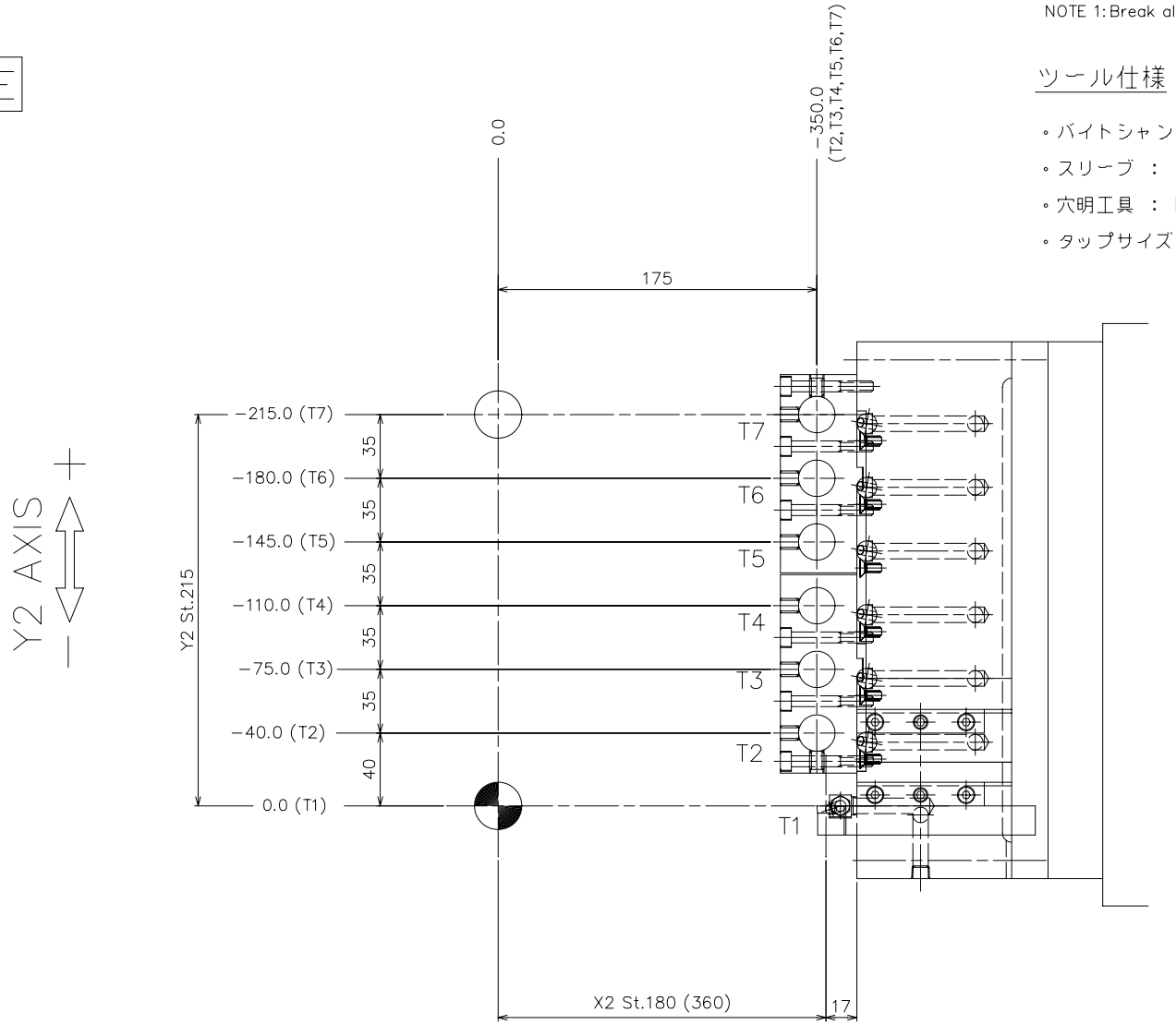
# No.2 SLIDE

## ツール仕様

- バイトシャンク ： □16
- スリーブ ： φ20
- 穴明工具 ： Max φ12
- タップサイズ ： Max M8

## 使用条件

- 最大工具取付本数－7本
  穴6(MAX)－外1
  穴5－外2(MAX)




※( )内直径値

X2 AXIS

+ ⟷ −

| REVISIONS | |
|---|---|
| NO. | |
| NO. | |
| NO. | |
| 1 | 04/28/05 NO.054M053 NEW |

Miyano

| COMMON TOLERANCE (MIDDLE CLASS) | |
|---|---|
| 6MAX | ±0.1 |
| 6 TO 30MAX | ±0.2 |
| 30 TO 120MAX | ±0.3 |
| 120 TO 315MAX | ±0.5 |
| 315 TO 1000MAX | ±0.8 |
| 1000 TO 2000MAX | ±1.2 |

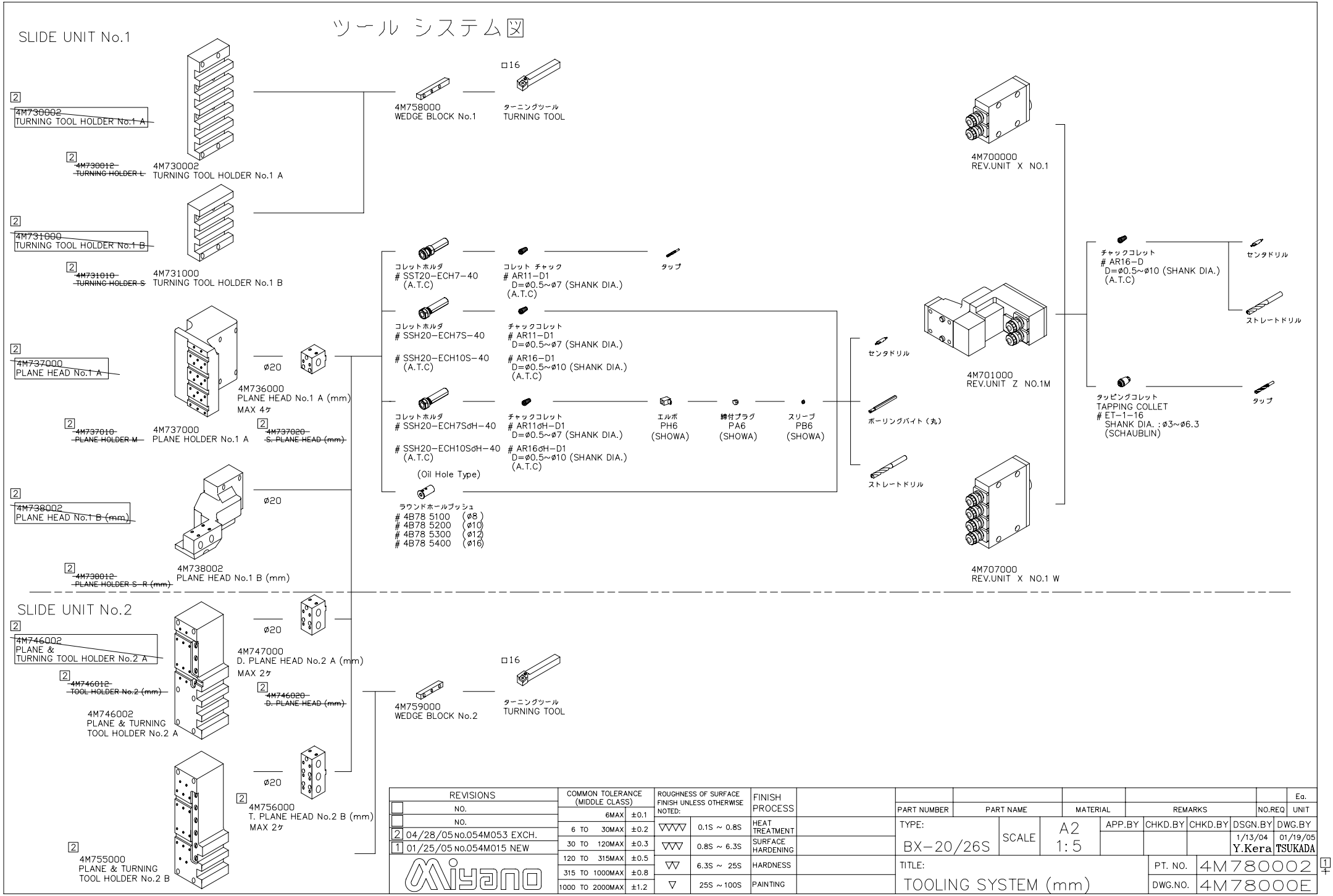
| ROUGHNESS OF SURFACE FINISH UNLESS OTHERWISE NOTED: | | FINISH PROCESS |
|---|---|---|
| ▽▽▽▽ | 0.1S ～ 0.8S | HEAT TREATMENT |
| ▽▽▽ | 0.8S ～ 6.3S | SURFACE HARDENING |
| ▽▽ | 6.3S ～ 25S | HARDNESS |
| ▽ | 25S ～100S | PAINTING |

| PART NUMBER | PART NAME | MATERIAL | REMARKS | NO.REQ | Ea. UNIT |
|---|---|---|---|---|---|

| TYPE: | SCALE | | APP.BY | CHKD.BY | CHKD.BY | DSGN.BY | DWG.BY |
|---|---|---|---|---|---|---|---|
| BX−20/26S | | A2 1:2 | | | | 01/13/05 TSUKADA | 04/28/05 TSUKADA |

| TITLE: | PT. NO. | 4M780002 |
|---|---|---|
| TOOLING SYSTEM (mm) | DWG.NO. | 4M78000F |

# ツール システム図




| REVISIONS | |
|---|---|
| | NO. |
| | NO. |
| 2 | 04/28/05 NO.054M053 EXCH. |
| 1 | 01/25/05 NO.054M015 NEW |

Miyano

| COMMON TOLERANCE (MIDDLE CLASS) | |
|---|---|
| 6MAX | ±0.1 |
| 6 TO 30MAX | ±0.2 |
| 30 TO 120MAX | ±0.3 |
| 120 TO 315MAX | ±0.5 |
| 315 TO 1000MAX | ±0.8 |
| 1000 TO 2000MAX | ±1.2 |

| ROUGHNESS OF SURFACE FINISH UNLESS OTHERWISE NOTED: | | FINISH PROCESS |
|---|---|---|
| ▽▽▽▽ | 0.1S ~ 0.8S | HEAT TREATMENT |
| ▽▽▽ | 0.8S ~ 6.3S | SURFACE HARDENING |
| ▽▽ | 6.3S ~ 25S | HARDNESS |
| ▽ | 25S ~ 100S | PAINTING |

| PART NUMBER | PART NAME | MATERIAL | REMARKS | NO.REQ | Ea. UNIT |
|---|---|---|---|---|---|

| TYPE: | SCALE | | APP.BY | CHKD.BY | CHKD.BY | DSGN.BY | DWG.BY |
|---|---|---|---|---|---|---|---|
| BX-20/26S | 1:5 | A2 | | | | 1/13/04 Y.Kera | 01/19/05 TSUKADA |

TITLE: TOOLING SYSTEM (mm)

PT. NO. 4M780002

DWG.NO. 4M78000E

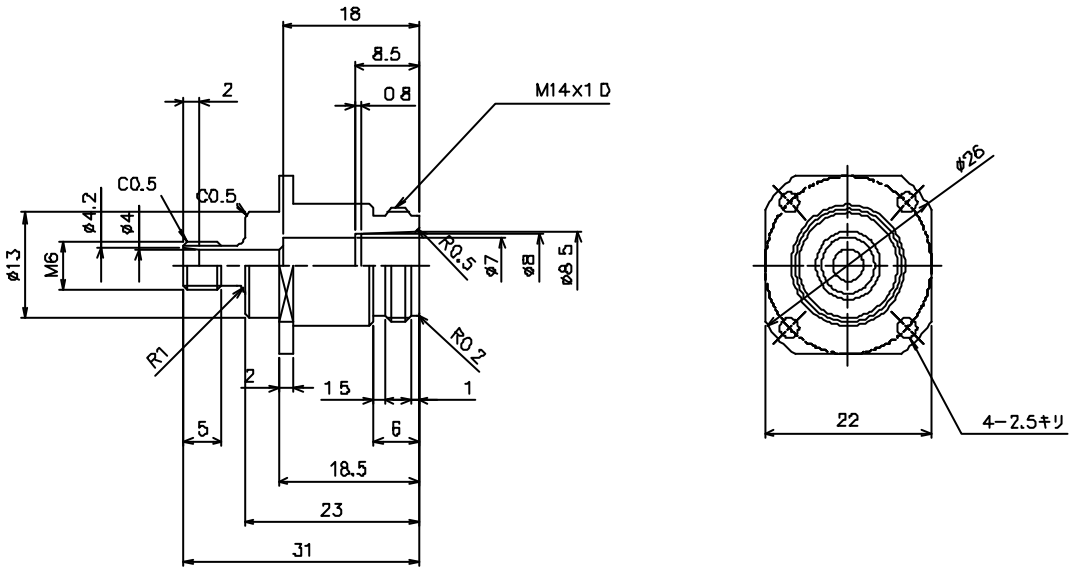
1/1

# * Sample Parts 1

**Material: DIN1.4305(X12 CrNiS 18 8)**

**Diameter of material: f 26mm**

**Cycle time: 262 sec/pce**



# * Sample Parts 2

**Material: DIN1.0715 (9 SMn 28)**

**Diameter of material: f 18mm**

**Cycle time: 240 sec/pce**