CITIZEN

Miyano

BNJ51SY

Fixed Headstock Type CNC Automatic Lathe

EcoBalance Machine Certification Model for a Sustainab

LFV technology resolves various issues related to chips, improving productivity.
The model is equipped with environmentally friendly features that minimize energy use,
such as power consumption reduction technology,
air consumption reduction technology, and visualization of CO2 emissions.

EcoBalance Machine

CITIZEN MACHINERY aims to create a sustainable society by innovating customers' manufacturing workflow with a focus on their future issues as well as their current ones.
We work to continuously enhance corporate value through "sustainable management" that takes into account social issues such as human rights and the global environment throughout the value chain, while certifying products and services that contribute to a sustainable society, including our proprietary technologies typified by LFV (low frequency vibration cutting) technology and the "FA-friendly" robot systems, as "EcoBalance Machines" centering on the Cincom and Miyano brands.

le Society

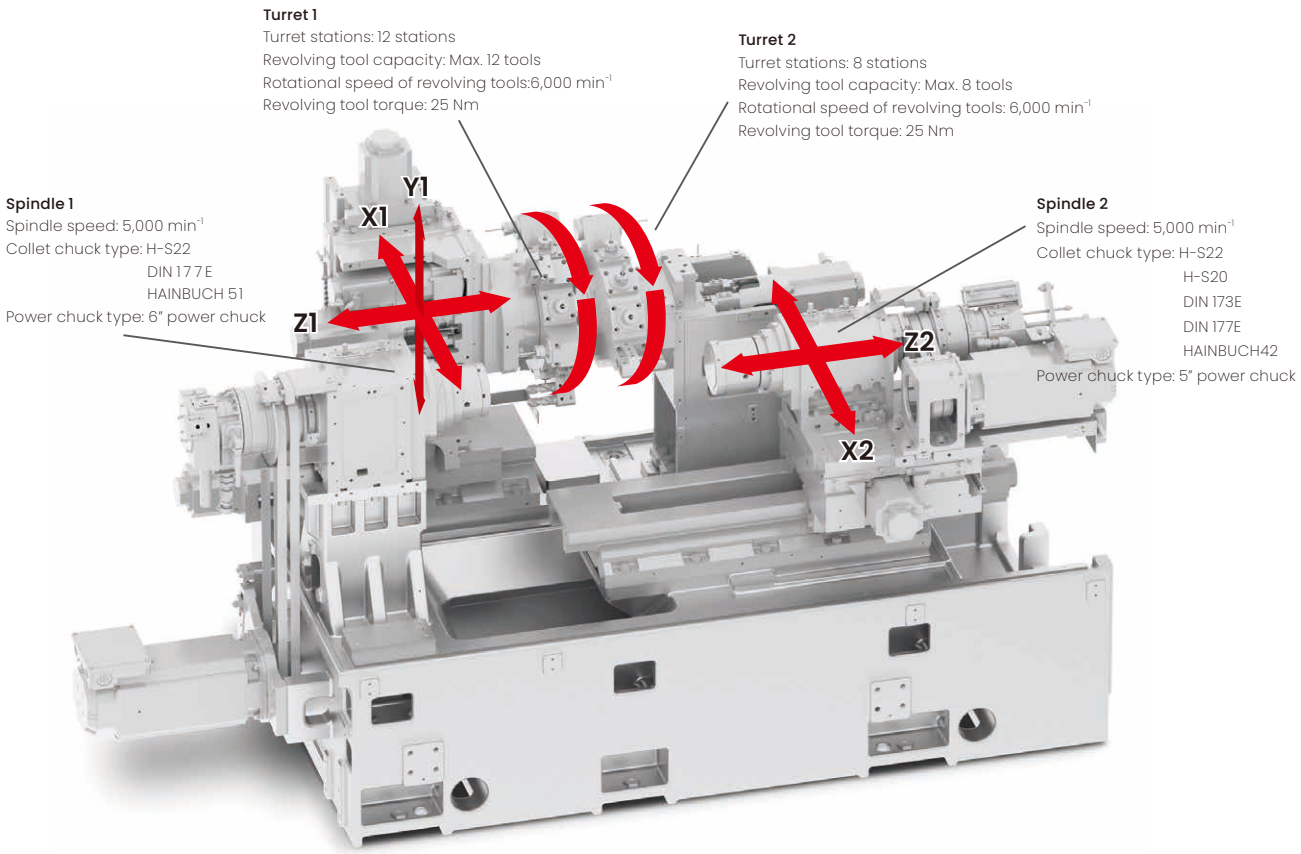

CITIZEN
Miyano
EcoBalance Machine
BNJ51SY
LFV
technology

The best seller under the Miyano brand, the BNJ, has undergone a full revamp

Despite being a high-performance 2-spindle, 2-turret machine, it has a small footprint.
The new product design incorporating a large window improves visibility, and future system expansion needs are accommodated by providing a variety of optional devices and functions for automation and labor savings.

Basic construction

These bar work machines are capable of complex machining on front and back faces using a combination of a turret 1 equipped with a Y-axis, a uniquely-shaped turret 2, a spindle 1, and a spindle 2 that can be moved on the X2 and Z2 axes.
The increased ball screw diameter of ϕ32mm on all axes improves basic performance and extends service life, while the highly rigid bed and box slideways support stable machining, enabling efficient complex machining.

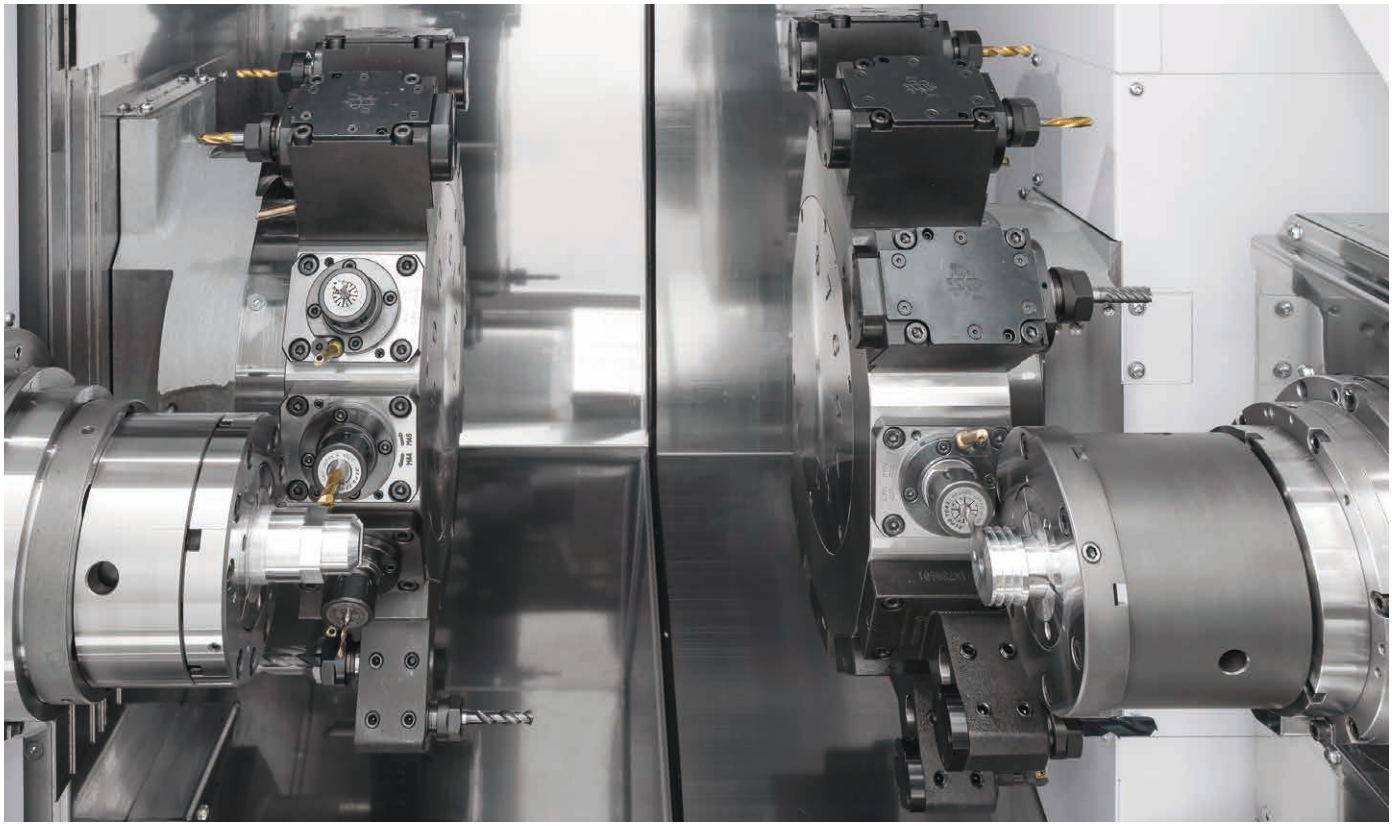


Improved access to the machining chamber

A large sliding door is used for better working convenience inside the tooling area.The end face of the chucks and the machining point can be checked at a glance, and the generous opening gives good access and reduces the workload during setup changes.

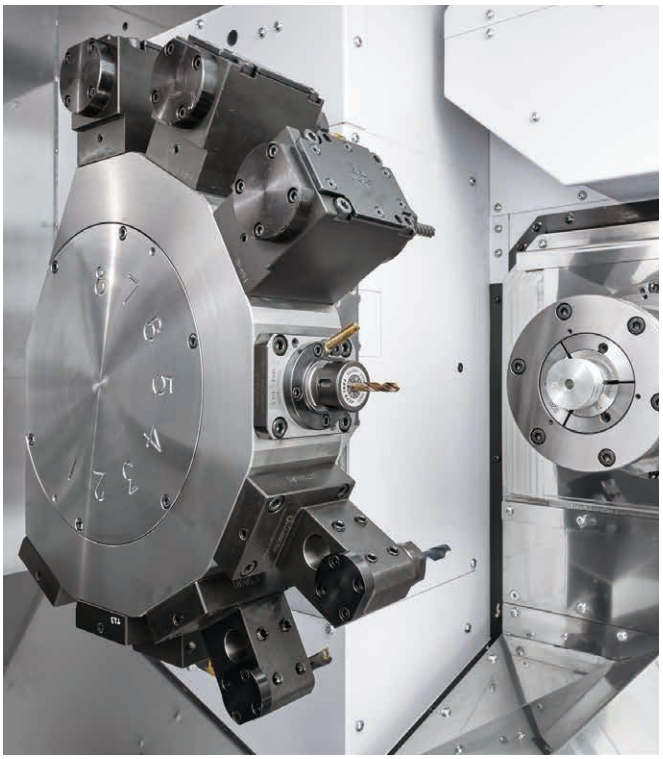
Revolving tools with the same capabilities on the right and left turrets

Single drive has been adopted for revolving tools on turret 2.Tools for turret 2 are common-use with turret 1, increasing the revolving tool capacity to 8 tools.The rotational speed of the revolving tools on turret 2 has been increased from 3,000 min-1 to 6,000 min-1, and the torque from 10 Nm to 25 Nm, equalizing the capabilities at the right and left turrets.



Expanded machining area for spindle 2

The machining area at the back side has been extended by 65 mm compared to the existing machines, enabling a ϕ51 mm chuck dedicated to spindle 2 to be mounted. (Photo shows H-S22)



Shortened cycle times

Cycle times are reduced by adopting the latest spindle motors to cut acceleration and deceleration times, increasing the rapid traverse rate on the slides from 20 m/min to 24 m/min, and by using the latest NC unit.

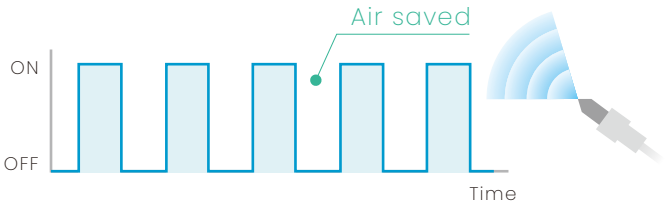
Technology Supporting "EcoBalance Machine"

Idling stop function

Used to stop unnecessary machine operation in the standby status where no programmed operation is in progress, thereby reducing power consumption.

Air blow intermittent discharge function

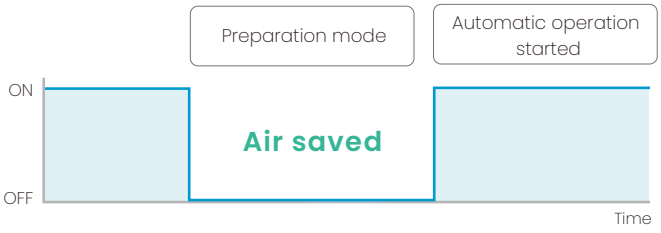
Air consumption is reduced by approximately 60% while maintaining the effect and performance of the air blow.



Air purge control function

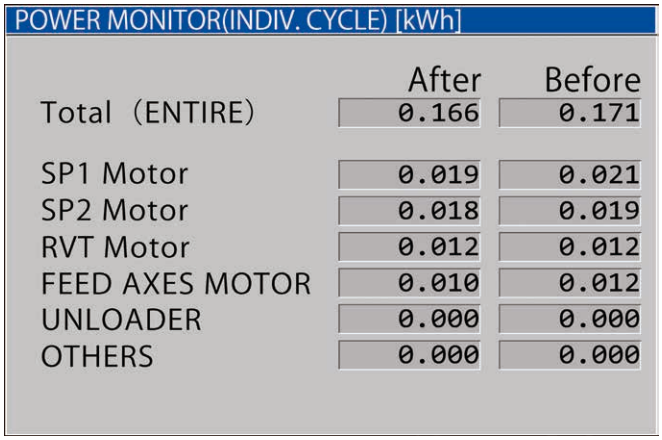
Spindle air purging is shut off when the preset time has elapsed, thereby greatly reducing air consumption during standby.

Air purge OFF during setup or non-operation, and air purge ON during coolant discharge or machine operation



Eco II

"Eco II", which supports customers' efforts to save power, provides visibility into the power consumption, CO2 emissions, and reduction effects for each function.
It facilitates efforts to reduce power consumption.



LFV technology

The slideways incorporate the LFV technology. Simultaneous four-axis control is possible while maintaining machine rigidity. LFV on the X2 and Z2 axes can be specified for back machining while LFV on the X1 and Z1 axes are specified for front machining. Cutting down the volume of chips shortens the downtime, due to tank cleaning and chip trouble, and extends the possible duration of unmanned operation.

Chips generated by conventional cutting

Chips with LFV

MOVIE

LFV mode 1

When you want to thoroughly break up chips

Method where the number of vibrations per revolution of the workpiece is specified

Explanation

LFV mode 3

When you want to break up chips in thread cutting

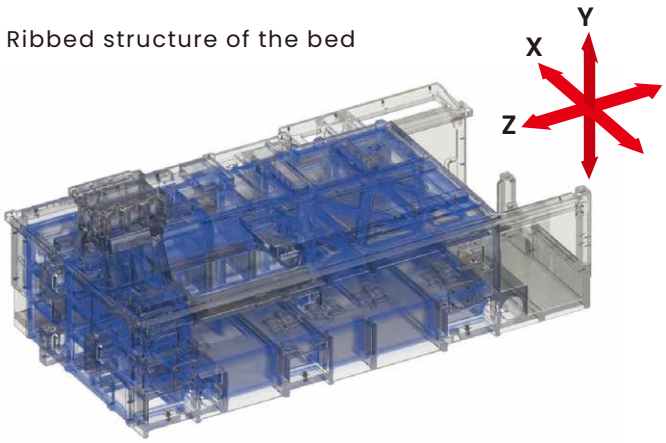
Method where machining is performed while changing the vibration timing every thread cutting pass

Explanation

Improved machine rigidity

The structure of castings like the bed has been revised, and machine rigidity has been increased through an optimized rib arrangement, resulting in significantly improved machining accuracy and tool lives.

Ribbed structure of the bed



Percentage increase in static rigidity of each axis compared to existing machines

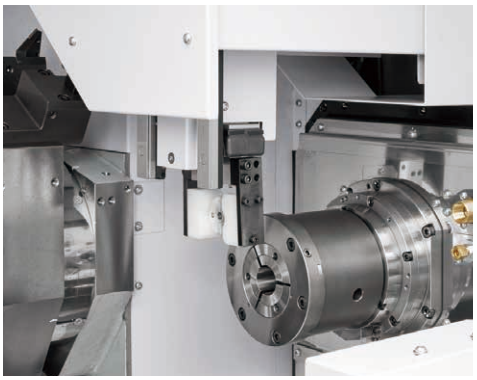
X axis	Y axis	Z axis
10%	60%	40%

Options

A range of options are available. Contact your sales representative.

Unloader

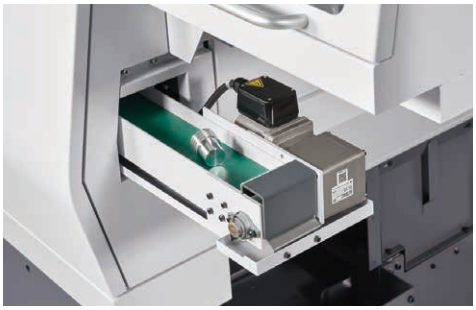
It contributes to automation and labor savings by preventing dents and transferring workpieces to the next process.



Max. unloadable workpiece weight: 4.0 kg
Workpiece size: Φ51 mm×255 mm
(SP2 chuck H-S22)

The size of workpiece that can be collected varies depending on the chuck used on spindle 2.

Workpiece separator & conveyor



Workpiece size: Φ51 mm×120 mm

FA Friendly

"FA Friendly" is a solution that addresses automation and labor saving needs.

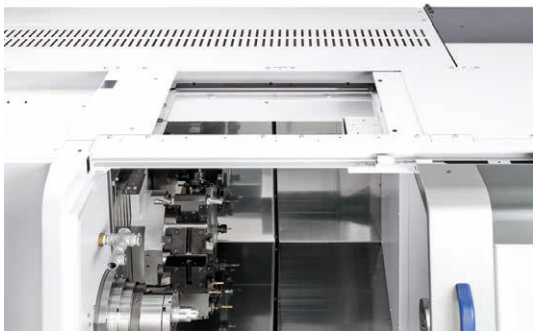
FA Friendly helps achieve factory automation at customers' plants together with a group of products that can solve problems at the production site, from workpiece supply to unloading and storage.

FA Friendly

MOVIE

By unloading workpieces from the optional unloader unit used in combination with the FA Friendly on-cart type robot, downstream processes such as simple cleaning, air blow, and storage can be automated.

FA Friendly on-cart type



Automatic shutters for loading and unloading hands for an on-machine robot or gantry loader are provided on the top of the machine.

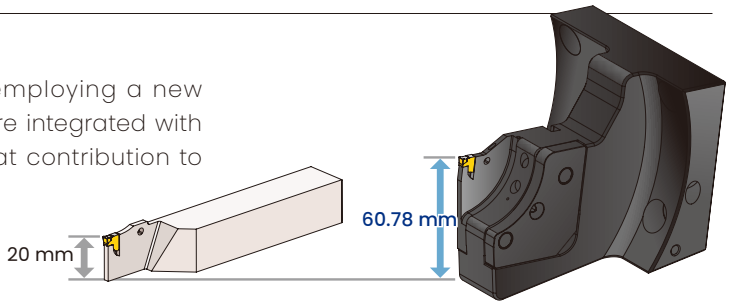
Combination with an FA Friendly on-machine type robot and stocker.

High performance tools

High feed cut off tool holder

High feed cut-off machining has been achieved by employing a new concept and dedicated design for a cut-off tool structure integrated with a tool holder. The shorter machining times make a great contribution to reducing running costs.

MOVIE



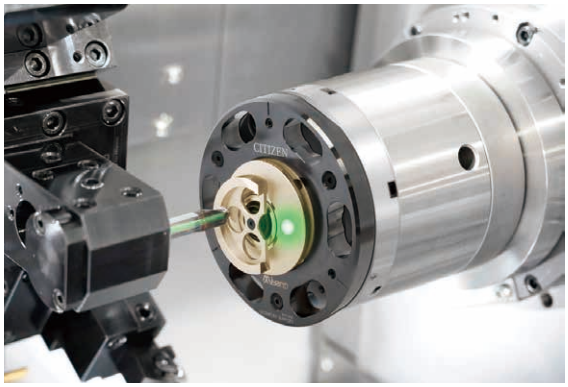
Cut-off time comparison for diameter 40 mm material

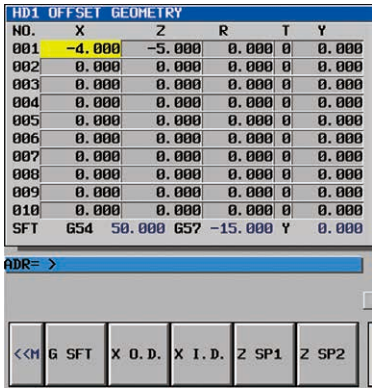
Cutting speed 80 m/min
(constant surface speed)
Feed rate 0.10 mm/rev 11.7 sec.

Cutting speed 80 m/min
(constant surface speed)
Feed rate 0.30 mm/rev 4.8 sec.
(3 mm blade)

Geometry Support

Geometry offset setting is supported by the touch type sensor.Offsetting can be completed just by bringing the cutting edge to be measured into contact with the sensor and pressing the button corresponding to the position where the sensor has been contacted on the dedicated NC screen.





MOVIE

Applicable chucks

H-S16、S20、S22
DIN171E、173E、177E

Connected with IoT Friendly to make the most of the machine with alkapplysolution

The IoTFriendly function connects automatic lathes to the network. Simply plug the LAN cable into the connection port at the side face of the machine to connect to the network. Various alkapplysolution software packages can be used depending on the purpose, such as for inputting/outputting NC programs or grasping a variety of information by monitoring machine operation data.

alkapplysolution

alkarttransfer
Enables inputting/outputting of NC programs via the network.

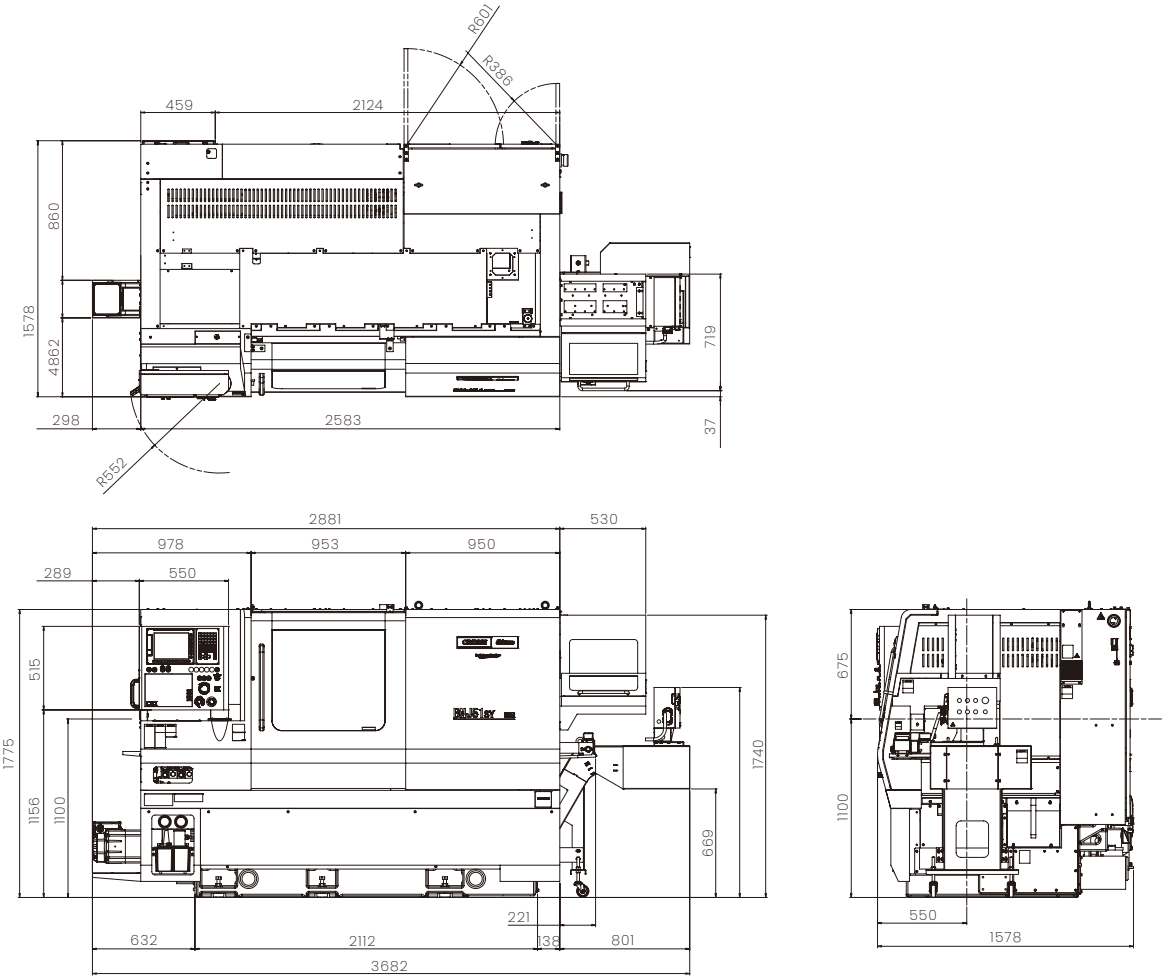
alkartalert
Notifies you about machine alarms via email in a timely manner.

alkartlive 2
This is a "machine data collection tool" that visualizes production results, operating status, etc.

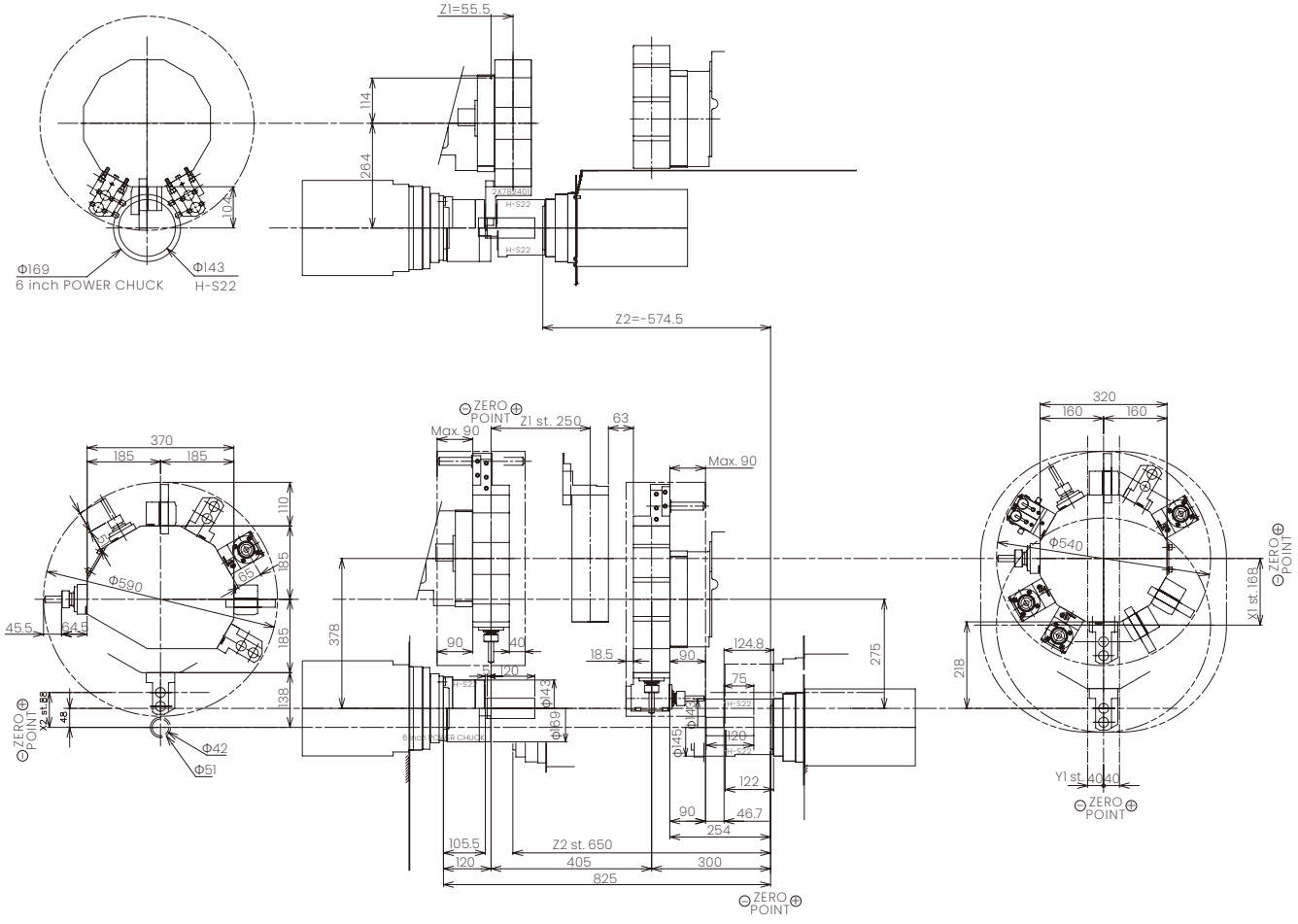
Changing the way you work with alkartlive 2

alkartlive 2 helps you to improve production efficiency by visualizing the machine stop times and causes.Data is automatically aggregated to reduce man-hours, and the accumulated data can be used for consideration in preventative and predictive maintenance.

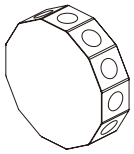
External View



Tooling Area

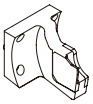


Tooling Syatem



12 STATION TURRET

EG734000
TURRET BLANK PLATE



EG731000
HIGH FEED CUTOFF TOOL HOLDER L
(ISCAR)

2X782301
CUT OFF TOOL HOLDER R
20 mm Sq.

2X782401
CUT OFF TOOL HOLDER L
20 mm Sq.

1X784600
DOUBLE TURNING HOLDER B
20 mm Sq.

1X784100
DOUBLE TURNING HOLDER
20 mm Sq.

1X780100
TURNING HOLDER A
20 mm Sq.

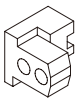
1X780200
TURNING HOLDER B
20 mm Sq.

1X780300
TURNING HOLDER C
20 mm Sq.
1X780320
STOPPER PLATE

1X784700
CUTOFF TOOL HOLDER B
20×12 mm

4W734000
CUTOFF TOOL HOLDER
20×12 mm

1X784300
DOUBLE & TURNING HOLDER F
20 mm Sq. 25 mm Dia.
1X780320
STOPPER PLATE

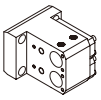


1X784400
DOUBLE & TURNING HOLDER R
20 mm Sq. 25 mm Dia.

1X780500
TURNING & PLAIN HOLDER
20 mm Sq. 25 mm Dia.

1X780601 (through hole)
DOUBLE PLAIN HEAD C
25 mm Dia.
1X780620
CAP

1X784200
DOUBLE PLAIN HEAD B
25 mm Dia.

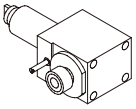


4N781021 (through hole)
Y DOUBLE PLAIN HEAD A
25 mm Dia.
4N781020-02
CAP A

ROTARY TOOL UNIT

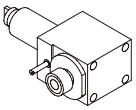
AR20

2X785600
X SPINDLE UNIT
(MITSUBISHI)



2X785500
Z SPINDLE UNIT
(MITSUBISHI)

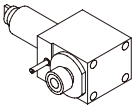
2X785650
X SPINDLE UNIT
(ALPS TOOL)



2X785550
Z SPINDLE UNIT
(ALPS TOOL)

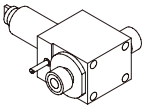
AR25

2X785150
X SPINDLE UNIT
(ALPS TOOL)



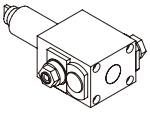
2X785250
Z SPINDLE UNIT
(ALPS TOOL)

AR20-11



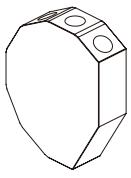
2W785350
Z DOUBLE SPINDLE UNIT
(ALPS TOOL)
Tool protrusion length on SP2 limited

AR16



DN70A000
Z DOUBLE SPINDLE UNIT
(ALPS TOOL)
Tool protrusion length on SP2 limited

ROTARY TOOL UNIT



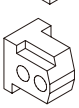
8 STATION TURRET

EG734000
TURRET BLANK PLATE

1X780100
TURNING HOLDER A
20 mm Sq.

1X780200
TURNING HOLDER B
20 mm Sq.

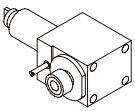
1X780500
TURNING & PLAIN HOLDER
20 mm Sq. 25 mm Dia.



1X780601 (through hole)
DOUBLE PLAIN HEAD C
25 mm Dia.
1X780620
CAP

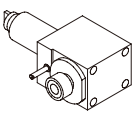
AR20

2X785600
X SPINDLE UNIT
(MITSUBISHI)



2X785550
Z SPINDLE UNIT
(MITSUBISHI)

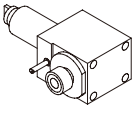
2W785650
X SPINDLE UNIT
(ALPS TOOL)



2W785550
Z SPINDLE UNIT
(ALPS TOOL)

AR25

2W785150
X SPINDLE UNIT
(ALPS TOOL)



2W785250
Z SPINDLE UNIT
(ALPS TOOL)

Machine Specifications

Item		BNJ-51SY7
Performance•Capacity		
Distance between spindle end faces		825 mm
Standard workpiece collection length		120 mm
Standard machining diameter	SP1	51 mm
	SP2	51 mm
Spindle		
Number of spindles		2
Max. spindle speed	SP1	5,000 min^{-1}
	SP2	5,000 min^{-1}
Draw tube through-hole diameter	SP1	52 mm
	SP2	43 mm
Collet chuck type	SP1	H-S22, DIN177E, Hainbuch 51
	SP2	H-S22, H-S20, DIN173E
Power chuck type	SP1	6" hollow chuck
	SP2	5" hollow chuck
Tool slide		
Number of tool slides		2
Type of tool slide	TR1	12 St
	TR2	8 St
Tool		□20 mm
Sleeve		Φ25 mm
Revolving Tool		
Revolving tool capacity	TR1	Max. 12
	TR2	Max. 8
Revolving tool drive type	TR1	Single drive mechanism
	TR2	Single drive mechanism
Rotational speed of revolving tools	TR1	6,000 min^{-1}
	TR2	6,000 min^{-1}
Max. drilling diameter	TR1	Max. Φ13 mm
	TR2	Max. Φ13 mm
Max. tapping diameter	TR1	Max. M12×1.75 (S45C)
	TR2	Max. M12×1.75 (S45C)
Slide stroke		
Turret slide stroke	X1 axis	168 mm
	Z1 axis	250mm
	Y1 axis	±40mm
Spindle slide stroke	X2 axis	88 mm
	Z2 axis	650 mm
Feed rate		
Rapid feed rate	X1 axis	24 m/ min
	Z1 axis	24 m/ min
	Y1 axis	18 m/ min
	X2 axis	24 m/ min
	Z2 axis	24 m/ min
Motor		
Motor for spindle	SP1 Cs	15 / 11 kW (15 min/cont.)
	SP2 Cs	7.5 / 5.5 kW (15 min/cont.)
Motor for revolving tools	TR1	2.2 kW
	TR2	2.2 kW
Motor for feed axes		1.7 kW (X1, Z1, Y1, Z2, X2)
Motor for hydraulics		1.5 kW
Motor for lubricating oil		0.004 kW
For coolant pump		0.25 kW×1, 0.18 kW×1
Turret indexing motor		1.0 kW
Required power source		
Power source used		AC 200±10%
Power capacity		33 kVA
Load operation average power consumption		18.9 kVA
Pneumatic source		0.5 MPa
Main breaker capacity		125 A
Tank capacity		
Hydraulic tank capacity		18 L
Lubricating oil tank capacity		4 L
Coolant tank capacity		276 L
Machine size		
Machine height		1,775 mm
Machine body dimensions		2,881×1,578 mm
Machine weight		5,550 kg

Standard NC Functions

FANUC 0i-TF Plus	
10.4-inch color LCD	USB slot
Collision detection function	Product counter: Max. 8 digits
Tool offset pairs: 128	Automatic power-off function
B code I/F	Program storage area
Corner chamfering/Corner rounding	Optional block skip (9 sets)
Spindle constant surface speed control function	Spindle C-axis function
Spindle synchronized function	Canned drilling cycle
Helical interpolation function	Polygon turning function
Synchronized tapping function	Sub-micron function
Thermal displacement correction function	Milling interpolation function
Power consumption monitor	Eco II

Special Additional NC Functions

LFV mode 1	LFV mode 3
Geometry support	3D chamfering
Tool monitor	

Options

Spindle brake	Air blower
work ejector	Chip box
Work conveyor	Medium-pressure coolant (1 MPa)
Through-spindle air blower	Turret air blower
Work separator	Part box
Mist collector duct & fire prevention damper	Chip conveyor
Through-spindle bushing	3-color signal tower
RS232C	Cut-off tool breakage detector
Drill breakage detector	Auto shutter
Unloader	

CITIZEN

URL:**https://cmj.citizen.co.jp/**

CITIZEN MACHINERY CO., LTD.

JAPAN	CITIZEN MACHINERY CO.,LTD.	TEL.81-267-32-5901
SOUTH ASIA/ KOREA	CITIZEN MACHINERY CO.,LTD.	TEL.81-267-32-5961
ASEAN	CITIZEN MACHINERY ASIA CO., LTD.	TEL.66-35-90-2640
TAIWAN	CINCOM MIYANO TAIWAN CO.,LTD	TEL.886-2-2715-0598
CHINA	CITIZEN (CHINA) PRECISION MACHINERY CO., LTD.	TEL.86-533-6150560
GERMANY	CITIZEN MACHINERY EUROPE GmbH.	TEL.49-711-3906-100
UK	CITIZEN MACHINERY UK Ltd.	TEL.44-1923-691500
ITALIA	CITIZEN MACCHINE ITALIA s.r.l.	TEL.39-035-877738
FRANCE	CITIZEN MACHINERY FRANCE S.A.S.	TEL.33-4-5098-5269
SPAIN	EGASCA, S.A.	TEL.34-943-200300
AMERICA	MARUBENI CITIZEN-CINCOM INC.	TEL.1-201-818-0100

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