FANUC's CNC for LASER cutting machine with high-speed LASER control

FANUC

Series 30*i*/31*i*-LB Plus
Series 0*i*-LF Plus

LASER cutting machine CNC capable of high-speed, high-

FANUC Series 30*i*/31*i*-LB Plus
FANUC Series 0*i*-LF Plus

More powerful and easier to use

- Equipped with FANUC's latest CNC and servo technologies
- High-speed LASER command synchronized with axis control
- Equipped with functions required for LASER cutting as standard
  - Cutting condition setting function
  - Power control function
  - Gap control
- Operation screen to support LASER processing
  - LASER dashboard
  - LASER cutting graphics
  - Cutting conditions database
- Improved basic performance (required functions are included as standard)
  - Customized functions
  - Multifunctional Ethernet *30*i*/31*i*-LB Plus only
  - Extended memory capacity

Mach Perfor

High synchronization of achieves high-quality cu
▶ Power control function

Improved productivity thro
▶ Fast Cycle-time Tech

Prevent sudden machine downtime with preventive maintenance
▶ Extensive failure prediction functions

Reduce recovery time by easily pinpointing faulty parts
▶ Diagnosis/maintenance functions

Minimizing Downtime

precision, high-performance LASER control

axis and LASER
tting.

ugh reduced cycle times
nology

Optimal CNC based on the application

CNC for multi-axis 3D LASER cutting machine

FANUC Series 30*i*-LB Plus

Max. number of paths : 4 paths
Max. total number of controlled axes : 32 axes
Max. number of simultaneous controlled axes : 24 axes
Max. number of connectable oscillators : 3

CNC for core LASER cutting machine

FANUC Series 31*i*-LB Plus

Max. number of paths : 4 paths
Max. total number of controlled axes : 26 axes
Max. number of simultaneous controlled axes : 4 axes
Max. number of connectable oscillators : 3

CNC for entry LASER cutting machine

FANUC Series 0*i*-LF Plus

Max. number of paths : 1
Max. total number of controlled axes : 7 axes
Max. number of simultaneous controlled axes : 4 axes
Max. number of connectable oscillators : 1

Integrated support of the shop floor
▶ **FANUC** *i*HMI

Original screen for ease of use
▶ Comes standard with customizability functions

IoT integration
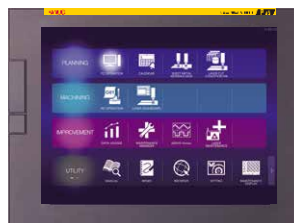▶ Extensive compatibility with field networks

Ease of Use

System Configuration

CNC Control Unit (LCD mounted type*/stand-alone type)

The display lineup supports a wide range of machines, from compact to large and standard to high-end, including the PANEL *i*H/*i*H Pro with *i*HMI support, a 10.4″ LCD unit, and more.
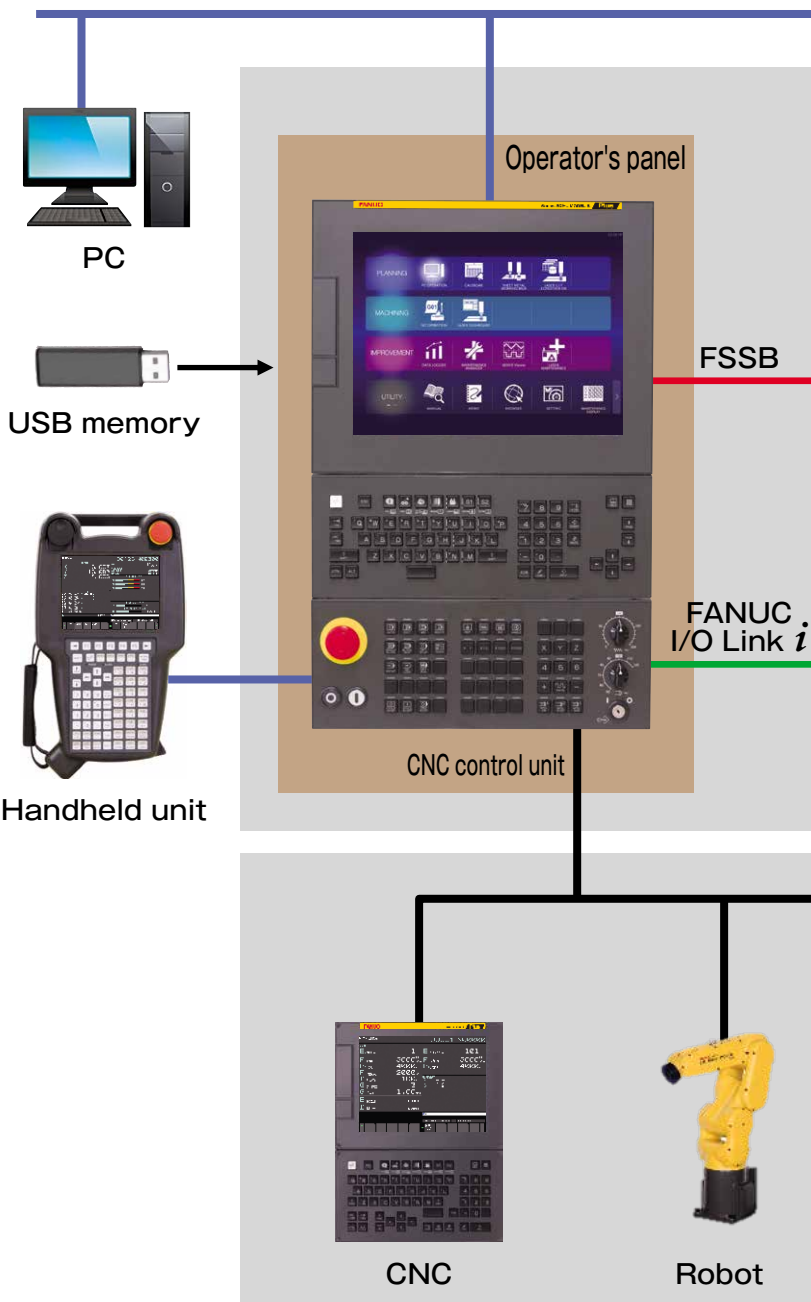
PANEL *i*H Pro
21.5″

PANEL *i*H/*i*H Pro
19″

PANEL *i*H/*i*H Pro
15″

PANEL *i*H/*i*H Pro
10.4″

10.4″ LCD*

PC

USB memory

Handheld unit

Operator's panel

CNC control unit

FSSB

FANUC
I/O Link *i*

CNC

Robot

Handheld Unit

Equipped with an emergency stop button and a manual pulse generator, this handy unit line-up achieves safe manual operation of machine tools.

*i*Pendant
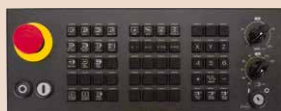
Handy Machine
Operator's Panel

Portable manual
pulse generator

I/O Unit

Wide range of I/O units compatible with various installation locations and I/O devices.

Optimized for operator's panels with its thin and space-saving design

Standard operator's panel with key input duplication

Handles the output/input of safety signals

Compatible with original operator's panels

Safety Machine operator's panel

I/O module for operator's panel supporting safety function

I/O module for operator's panel

Optimized for power magnetics cabinets with high scalability an

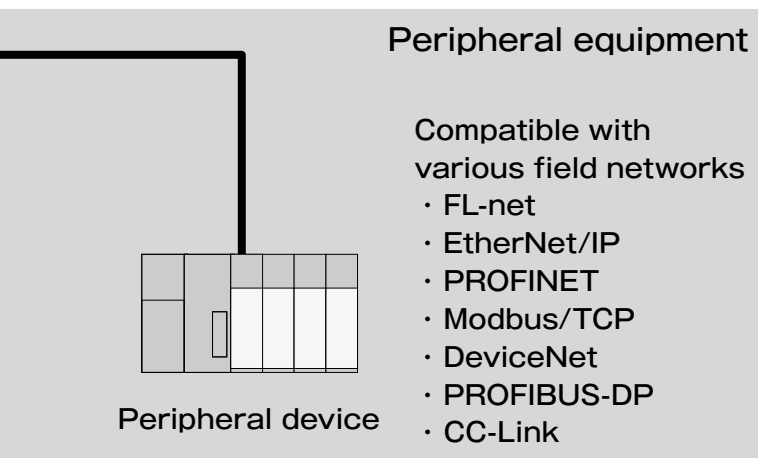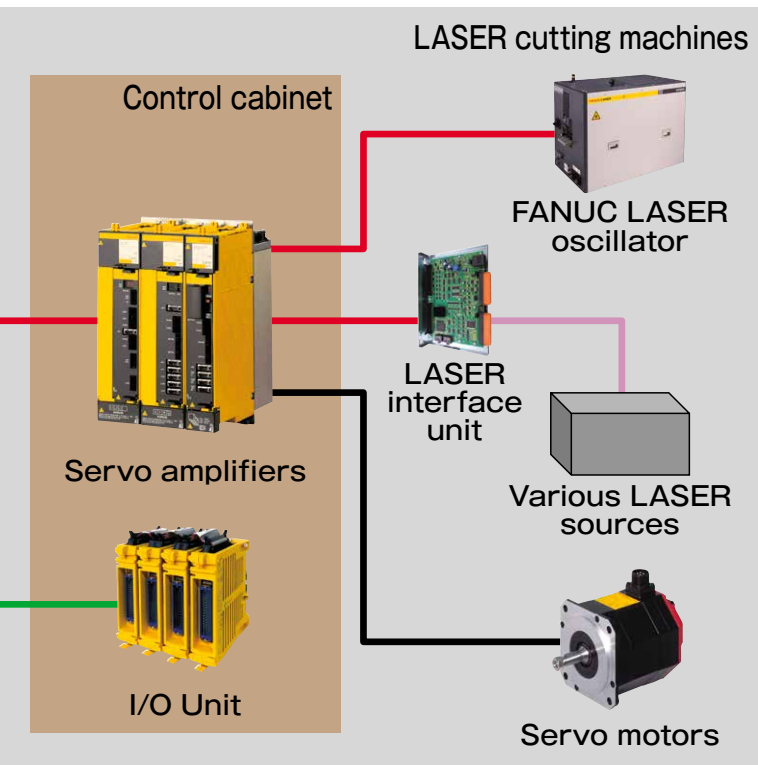Excellent cost performance with multi-point output/input

Compact and with reduced wiring

I/O unit for power magnetics cabinet

I/O module for connector panel

LASER oscillator

LASER oscillator lineup can handle a variety of LASER cutting to contribute to high-quality cutting

LASER F series

LASER C series *

Can be connected to non-FANUC LASER oscillators. Connection requires a LASER interface unit.

Servo Motor

Line-up to meet the various needs of LASER cutting machines and contribute to the performance improvement of feed axes

AC SERVO MOTOR *αi*-B/*βi*-B series

DD MOTOR D*i*S-B series

LINEAR MOTOR L*i*S-B series

Servo Amplifier

Line-up to be flexibly available for a variety of LASER cutting machines and contribute to the downsizing of cabinets

SERVO AMPLIFIER *αi*-B series

SERVO AMPLIFIER *βi*SVSP-B series

LASER cutting machines

Control cabinet

FANUC LASER oscillator

LASER interface unit

Various LASER sources

Servo amplifiers

I/O Unit

Servo motors

Peripheral equipment

Compatible with various field networks
- FL-net
- EtherNet/IP
- PROFINET
- Modbus/TCP
- DeviceNet
- PROFIBUS-DP
- CC-Link

Peripheral device

*30*i*/31*i*-LB Plus only

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d extensive modules such as the multi-point output/input type and the analog/digital output/input module

Reduced wiring work with a dismountable pole terminal block

Monitor machine status with the temperature sensor and the shock sensor

Extensive modules including analog, temperature input, and high-speed counter

Terminal Type I/O module

MULTI SENSOR I/O UNIT

I/O Unit-MODEL A

Optimized for reduced wiring by enabling distributed setup

Can be positioned near sensors scattered inside and outside the machine cabinet
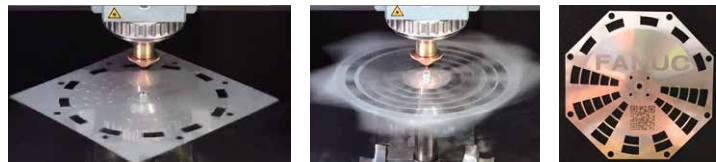
IP67 type

I/O Unit-MODEL B

Superior control functions and high operability

High synchronization of servos and LASERs

CNC sends an axis command to the servo motor and simultaneously generates an output command to the LASER oscillator to achieve high synchronization between the axis movement and LASER output.

CNC   Servo motor   FANUC LASER oscillator

High-speed, high-precision cutting of rotating workpiece, marking cutting ("FANUC" character marking: 120m / min)

FSSB connection
(**F**ANUC **S**erial **S**ervo **B**us)

Various LASER sources
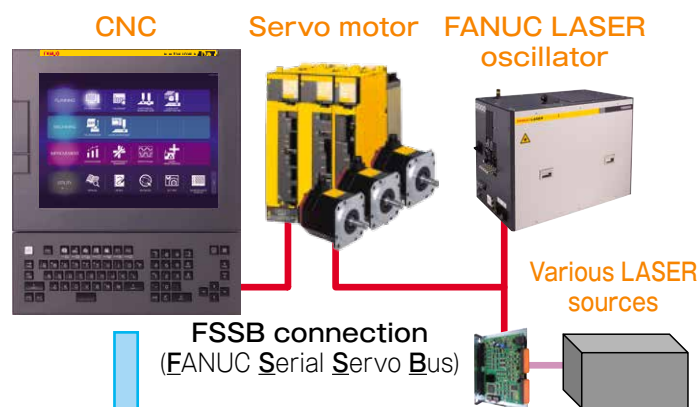
LASER output can be visualized by the FANUC SERVO GUIDE

Strong support for LASER cutting adjustments

The servo guide measures the servo waveforms, beam output waveforms, and PMC signals, to comprehensively handle adjustment tasks.
The LASER output status can be viewed with color-coding by the servo guide 3D display function.

Waveform observation

— Beam output
— X-axis speed
— Y-axis speed
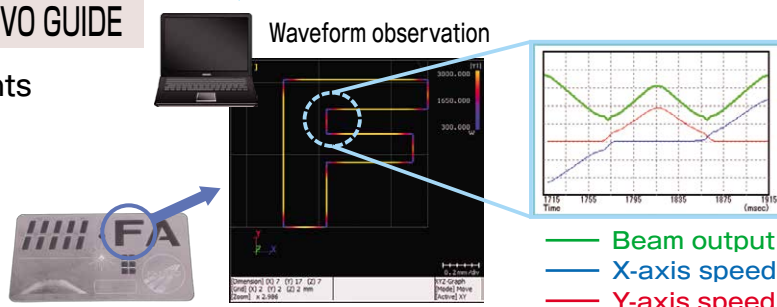
Equipped with functions required for LASER cutting as standard

Example LASER program

E1
E101 } Set the cutting conditions for cutting and piercing. Can be managed with the cutting condition database.
G13   : The nozzle approaches the workpiece to maintain a constant distance regardless of the shape of the workpiece.
G32 L2 : Controls the assist gas to improve processing quality and processing performance.(Piercing data)
G24   : Shaping the through hole before starting cutting allows for a stable cutting start.
G32 L1 : Controls the assist gas to improve processing quality and processing performance.(Cutting data)
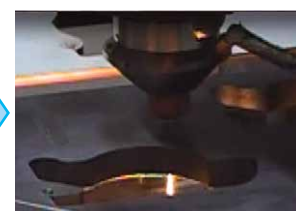G01 X_Y_ : The workpiece is cut along the cutting path.

Piercing

Changes LASER output by stages when piercing to optimize the power level, achieving stable piercing in the shortest time.

G24（S_P_Q_）
S : Power command
P : Frequency command
Q : Duty command

LASER beam
Cutting nozzle
Assist gas
Through hole
Workpiece
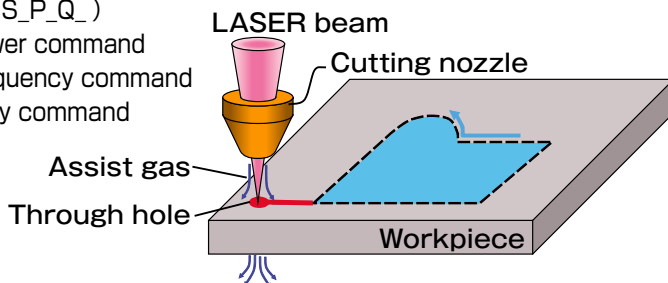
During piercing   Through-hole shaping

Cutting

The optimal cutting conditions will vary as the cutting speed changes at slender corners or when starting cutting. Power control functions are available to control LASER output coordinated with the speed of the controlled axis.

G01 X_Y_（S_P_Q_）
S : Power command
P : Frequency command
Q : Duty command

LASER beam
Cutting direction
Part shapes
Workpiece
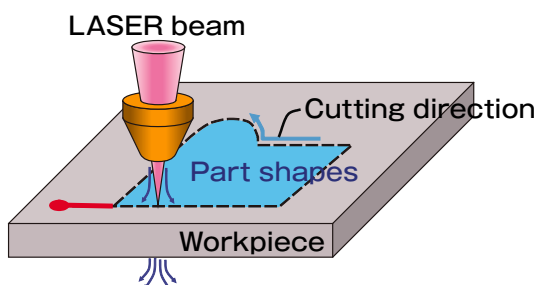
Fast Cycle-time Technology

Fast Cycle Time Technology refers to CNC and servo technologies that achieve reduced cycle times. It reduces cycle times of machining programs through methods such as accelerating and decelerating depending on the operational state and reducing the sequence processing time for external signals.
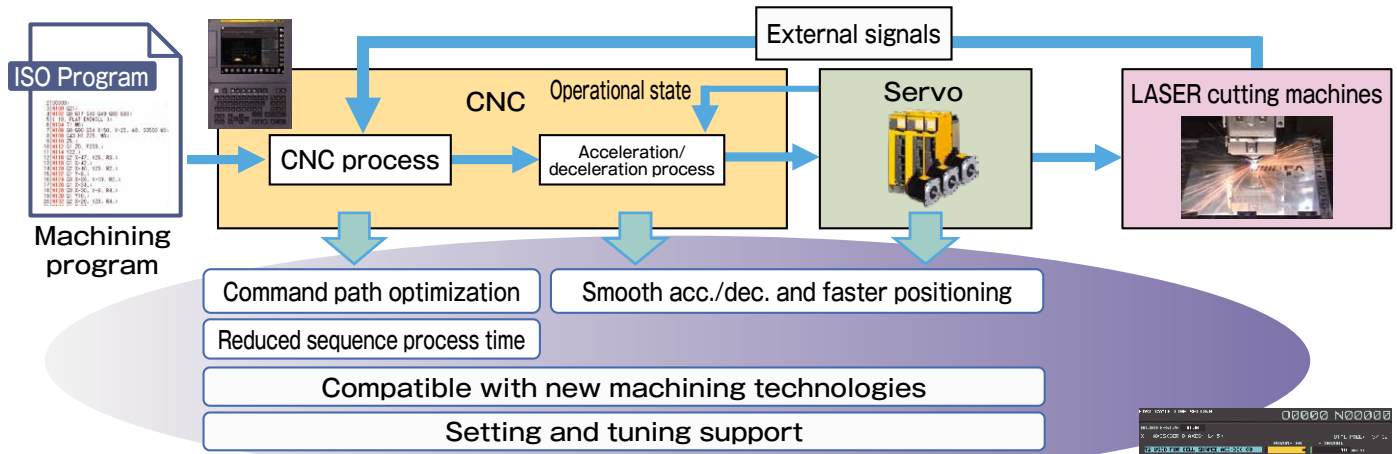
Fast Cycle-time setting

Easily reduce cycle times

The Fast Cycle-time setting compares the currently set parameter setting to the FANUC default setting, allowing you to easily use the setting that most effectively reduces cycle time.

Information necessary for LASER cutting is centered on the LASER dashboard screen

The *i*HMI LASER dashboard screen is primarily for LASER cutting HMI.
The CNC status display, LASER cutting conditions display, shape previews, and other information required for cutting are concentrated in a single screen.
The LASER dashboard screen allows you to see the shape before cutting, progress during cutting, and cutting conditions without requiring any screen transitions.
You can also easily set up your own screen transitions by allocating launcher soft keys to the required screens.


The program management slide previews the cutting shape of the program selected with the cursor, allowing you to select programs while checking the cutting shape.

Can allocate desired screens with launcher soft keys

Program management slide

Cutting conditions database can manage multiple cutting conditions

The LASER cutting conditions database is an application that saves cutting condition settings for each material and board thickness for retrieval with *i*HMI.
Cutting condition settings saved on the PANEL *i*H/*i*H Pro database (maximum 1000 can be saved for each material and board thickness) can be retrieved and forwarded to CNC memory cutting condition settings.
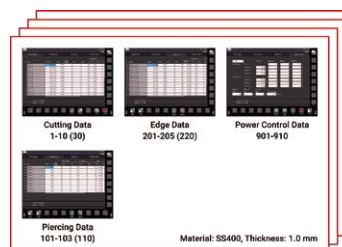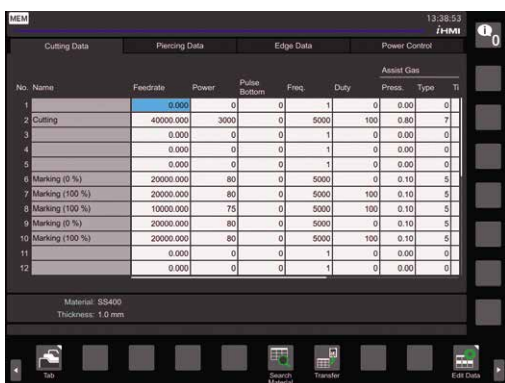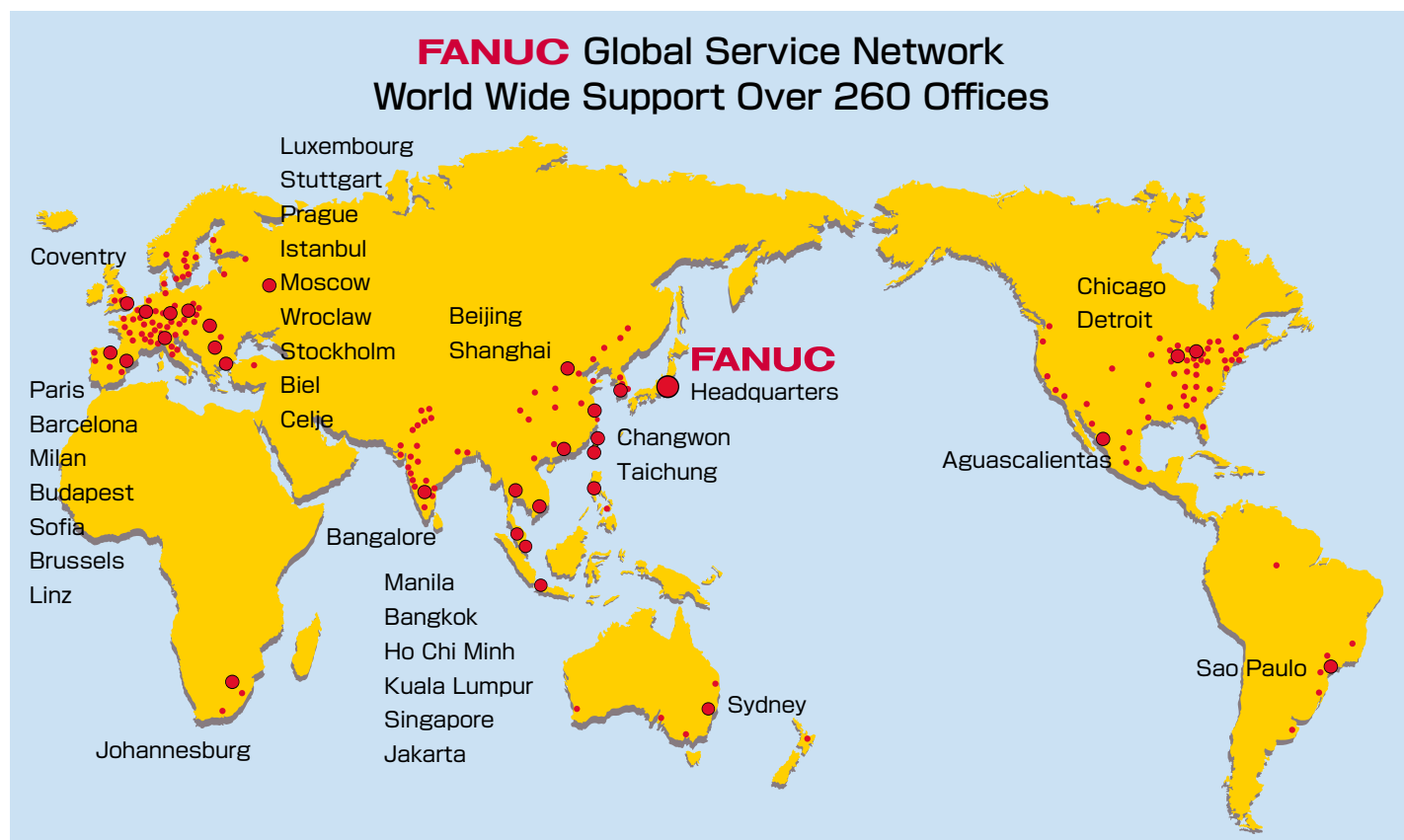

Select the cutting condition setting and forward to CNC memory

Maintenance and Customer Support

Worldwide Customer Service and Support

FANUC operates customer service and support network worldwide through subsidiaries and affiliates. FANUC provides the highest quality service with the prompt response at any location nearest you.

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Sao Paulo

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