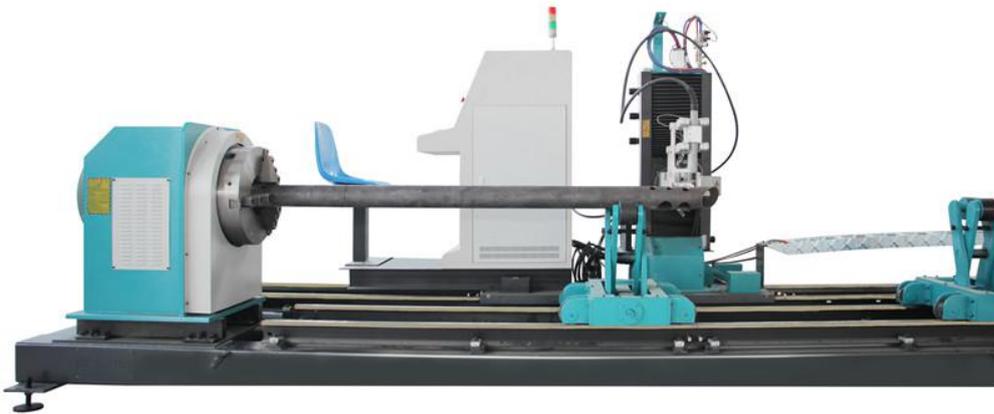


5 Axis CNC Pipe Cutting Machine YM-5P



This Picture is just for reference

I. Product Description

This machine is designed as a horizontal structure, mainly including base (square tube welding chassis), pipe rotating mechanism (three-jaw chuck and Y-axis rotating power device), steel pipe support bracket (4 groups of scissor shape brackets), torch moving mechanism, torch lifting mechanism, torch deflection mechanism (the parallelogram structure material is manufactured by aeronautical aluminum CNC machining center), walking track (high-precision machining 24KG guide rail as the transmission component of trolley), electrical control system, etc.

II. Technical Parameters

Processing size	Round pipe diameter	50-630mm
	Cutting length	Effective cutting length 12000mm
	Mainly used for thermal cutting of intersecting lines and ends of various piping systems. Applicable workpiece material: low carbon steel (copper nickel tube, stainless steel tube need to use plasma cut)	

Cutting form	Cutting mode	Flame/Plasma
	Plasma cutting thickness	(It is depended by plasma power source)
	Flame cutting thickness	Vertical cutting 6~60mm Bevel cutting 6-40mm
	Plasma bevel angle	Plasma cutting $\pm 45^\circ$
	Flame bevel angle	Flame hole cutting $\pm 55^\circ$ flame end cutting $\pm 60^\circ$
Machine accuracy	Required workpiece ellipticity	$\leq 1\%$
	Cutting speed	10~2000mm/min
	Moving speed	10~6000 mm/min
	Cutting length accuracy	$\pm 1.5\text{mm}$
	Standard for execution of cutting precision	ISO9013-2002 ,ISO8206-1991 and JB/T10045.4-1999JB
	Chuck type	Manual 3-jaw linkage self-centering
	Manual chuck tightening device	1 set
Bracket	Quantity	4 groups
Weight	Maximum loading weight	5000Kg
Color	Machine color	Our company color or customized

III. Motion range of host axis

▶ Y Axis: Pipe rotation driving axis

360° free rotation, Japanese Panasonic 3000W servo motor, the driving system is driven by a precision gear box and gear pair, the speed is 0.01-8r/min, and the positioning accuracy is $\pm 0.2^\circ$

▶ X Axis: Torch move along pipe axial direction

The max stroke is 12000mm, Japanese Panasonic 750W servo motor, the driving system is driven by precision gearbox, gear and rack, positioning accuracy $\pm 0.2^\circ$

▶ Z Axis: Torch lifting (The axis does not participate in linkage)

Max stroke 335mm, Japanese Panasonic 750W servo motor, the driving system is driven by precision gear box and ball screw, positioning accuracy $\pm 0.2^\circ$

▶ B Axis: Torch move along pipe axial direction

Swing $\pm 60^\circ$, Japanese Panasonic 400W servo motor, the driving system is driven by a precision gearbox, positioning accuracy $\pm 0.2^\circ$

▶ A Axis: Torch move along pipe radial direction

Pendulum angle $\pm 55^\circ$, Japanese Panasonic 400W servo motor, the driving system is driven by precision gearbox, positioning accuracy $\pm 0.2^\circ$

IV. Cutting Content

Maximum bevel angle: $\pm 45^\circ$

Cutting minimum cross angle: $\pm 30^\circ$

Cutting speed automatic stepless speed regulation;

Continuous cutting settings;

Automatic compensation of pipe ovality error;

Orthogonal main pipe riding type cutting;

Orthogonal main pipe insertion cutting;

Oblique cross main pipe cutting;

Oblique cross main pipe off-center cutting;

Bevel setting for fixed angle and fixed point;

Pipe end vertical and bevel cutting;

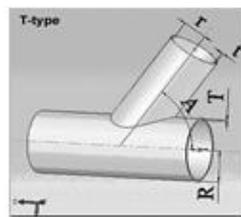
Pipe end cutting of Orthogonal and oblique branch pipes end cutting;

Orthogonal and oblique off-center main pipe cutting ;

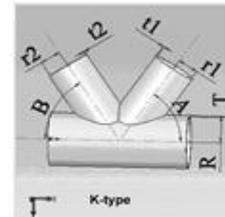
Orthogonal and oblique off-center branch pipe cutting;

Rectangular cutting on the surface of main pipe;

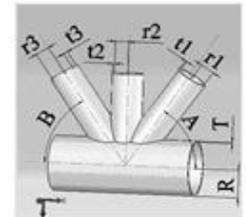
pipe slot joints ,off-center joints;



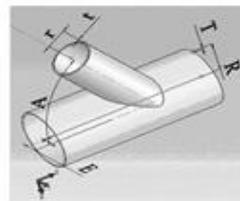
Slant off joint cutting



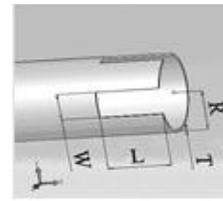
Slot joint cutting



Branch pipe joint



Slant off joint cutting



Slot joint cutting

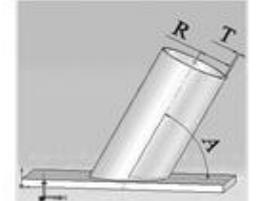
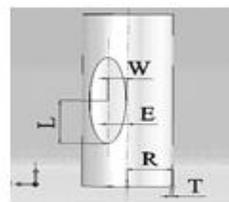
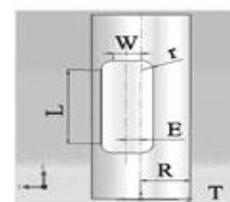


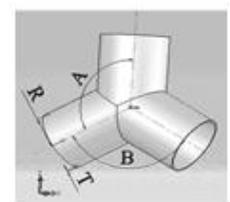
Plate branch pipe joint



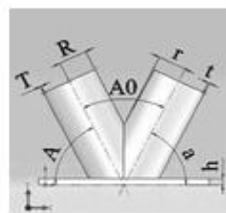
Oval cutting



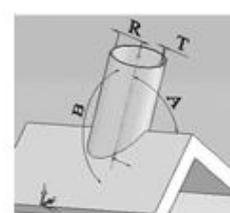
Round square hole cutting



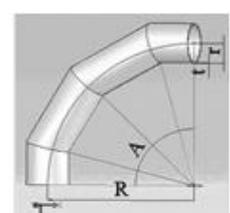
Connected pipe cutting



Double pipes inserting on plate



Rectangular branch pipe cutting



miter end cutting

Round pipe welding elbow, miter end cutting;

Bevel cutting;

Multi-branch pipes intersecting main pipe surface cutting ;

Multi-branch pipes intersecting branch pipe end cutting;

Marine engineering pipe obliquely cutting at both ends pipes.

V. Electric parts

5.1 Advantages of Schneider Electric Parts

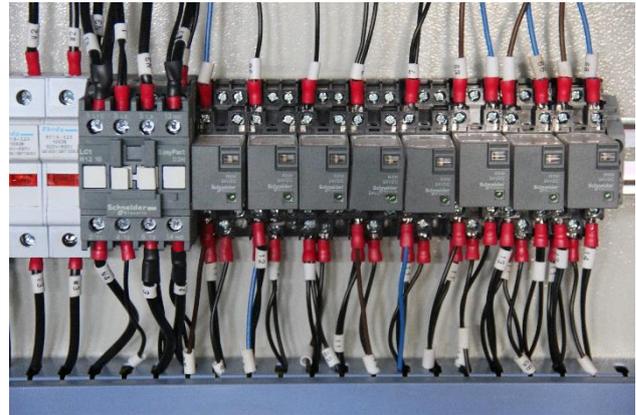
Equipment electrical design uses Schneider low-voltage electrical component products

Due to the reliable performance of Schneider products, our low-voltage appliances on our equipment will basically give priority to Schneider products, whether users are European companies or Japanese companies, Schneider products are more recognized.

(1) Schneider's low-voltage electrical appliances have a high market share in China, and it includes imported product series and domestic series, and their performance is very reliable. The product has good compatibility and expansibility. For example, there is a mature control scheme for load control. Various low-voltage electrical appliances contain a variety of options, adapt to variety of complex installation and use environment.

(2) The machine adopts core components such as automatic circuit breakers/contactors/relays/DC switching power supplies to improve the stability of equipment operation.

(3) The technical service of using branded spare parts is guaranteed, and technical online service support is provided.



5.2 Reducer advantages

Planetary reducer can mainly reduce the speed of motor while increasing the output torque.

- (1) The internal gear of the planetary reducer adopts 20CrMnTi carburizing quenching and grinding teeth. It has the characteristics of small size, light weight, high load capacity, long service life, stable operation, low noise, large output torque, high speed ratio, high efficiency and safe performance. It has the characteristics of power splitting and multi-tooth meshing.
- (2) Light weight, small size, large transmission ratio range, high efficiency, stable operation, low noise, strong adaptability, etc.
- (3) The reducer adopts involute planetary gear transmission, which reasonably utilizes internal and external meshing and power distribution
- (4) The gears are all carburized and quenched to obtain a high-hardness and wear-resistant surface. All gears are ground after heat treatment, which reduces noise and improves efficiency and service life of the whole machine



5.3 Advantages of Japanese Panasonic Servo Motors

(1) High motion accuracy: can achieve closed-loop control of position, speed and torque; overcome the problem of stepping motor out of step; with encoder feedback in time, read data to compare position accuracy.

Speed: good high-speed performance, generally rated speed can reach 1500 ~ 3000 rpm.

(2) Adaptability: It has strong anti-overload capability and can withstand three times the load of rated torque, especially suitable for occasions with momentary load fluctuations and quick start requirements.

(3) Stability: The low-speed operation is stable, and the low-speed operation will not produce a stepping phenomenon similar to a stepper motor. Suitable for occasions with high-speed response requirements.

(4) Timeliness: The dynamic response time of motor acceleration and deceleration is short, generally within tens of milliseconds.

(5) Comfort: significantly reduce heat and noise.

VI. Mechanical structure design advantages



The main structure of the equipment chassis is welded with square tube frame to provide the main part of the equipment.

1. It has the advantages of simple design structure and good manufacturing process performance. The main considerations are that the project requires outdoor field work, equipment handling, lifting and moving machine level adjustment, and provides simple and convenient operation and good flexibility.

The large-section 200mmx200mm square tube structural heavy frame and it has mechanical advantages such as strong load-bearing load capacity.



Chunk Box

It adopts steel plate tailor-welded box structure design, compact structure to improve overall rigidity and strength, each component installation surface is processed by CNC machining center at one time, to ensure the rotation running accuracy and machine tool verticality.

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www.danoxwelding.com
sales@danoxwelding.com

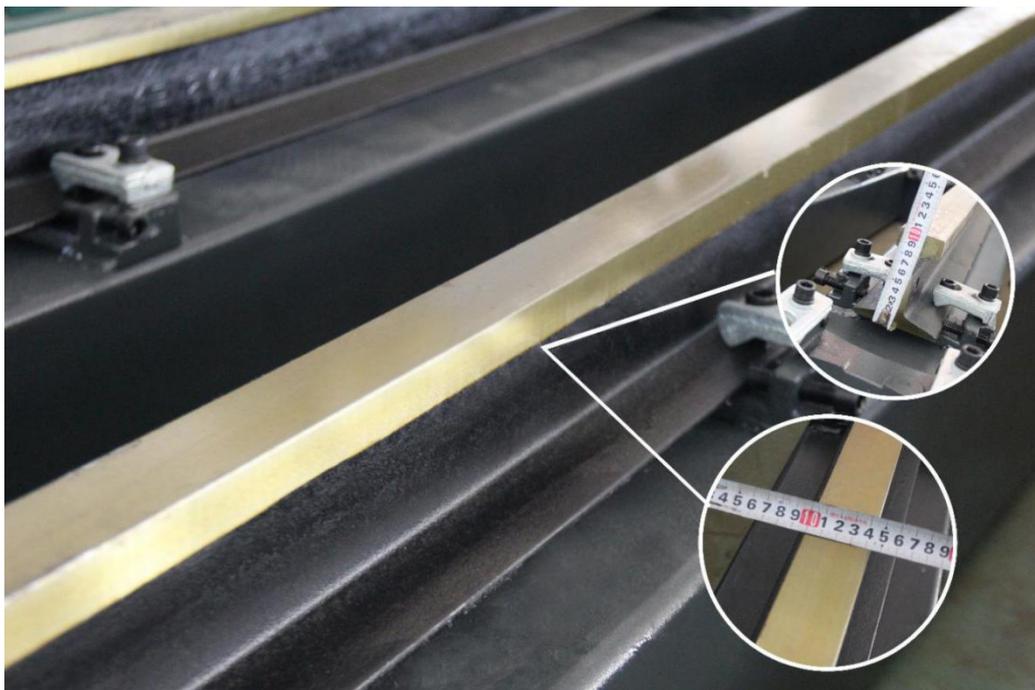
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29453

Retail
Blok D, No. 5 Jalan Pembangunan 2, Komplek
Batama, Batam, Kepulauan Riau- 29432



Upright Column

The upright column is mainly composed of plate tailor-welded main body, TBI linear guide rail, screw rod and quadrilateral connecting rod groove device, in which the plate tailor-welded main body structure is precisely processed by CNC machining center to ensure the stability and positioning accuracy of cutting torch.



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24KG Guide Rail

It is made of 24KG level 55Q ground rail, and the top surface and two side surfaces are precisely processed by a CNC grinder to ensure the horizontality and parallelism of the mobile torch trolley and improve the stability of the whole machine and the accuracy of the cutting axis.



Linear Guides

The important part of the equipment movement guide adopts the TBI linear guide slider, and it is a flange type, which has a higher load capacity and it is more convenient and easy to disassemble. High-speed feed and low-speed feed are easy and stable with good stability, it can withstand forces and moments in all directions.

Advantages of TBI Linear Guide

1. Installation accuracy: This type is self-aligning type, which can easily absorb the accuracy error of parallelism and horizontal between 2 axes, so as to realize high precision and smooth linear movement.
2. Excellent plane walking accuracy: TBI rail adopts a steel ball contact structure with strong radial load capacity, so when the radial load is applied, the displacement in the radial direction is small, and stable walking accuracy can be obtained.
3. Miniaturization and heavy load: Because the type of miniaturization design with low cross-section height has a steel ball contact structure with strong bearing capacity in the radial direction, it is most suitable for horizontal and vertical motion guidance. Improve equipment walking accuracy, load carrying capacity and rigidity, suitable for

reciprocating mechanical structure design.

Marine engineering pipe obliquely cutting at both ends pipes.

VII. System advantages

▶ Control system functions

The control system has a humanized interactive interface, and the operation is simple and intuitive, and the three-dimensional intersecting line imaging; Dynamic cutting simulation at a glance; the breakpoint memory has the function of returning to the original track and then switching back; fast automatic positioning, pause, acceleration and deceleration control; fault self-diagnosis and intelligent identification of operation errors, automatic alarm display, automatic diagnosis function; rich and expandable macro program calling and editing functions; Chinese and English display, man-machine dialogue function. With online and offline programming methods, information can be exchanged with the outside through U disk, network, etc., and can be manually input for temporary modification. multi-axis controller can control up to eight axes. Multiple intersecting lines can be cut continuously, multiple tubes intersect and cut at once to improve accuracy.

▶ Software performance

According to the given intersecting parameters, it can display the three-dimensional structural shape of the pipe fitting, the two-dimensional curve of the cross section of the unfolding, it can observe the three-dimensional image of the intersecting line cross-section from any angle, and has the animation of the simulation cutting, which can fully display the cross-sectional shape of the intersecting line that the customer cares about.

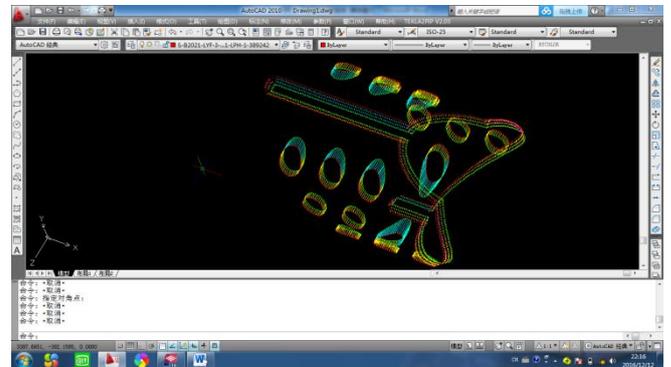
VIII. Detailed description of software advantages

1. Support TEKLA professional design software 3D round pipe entity seamless insection.

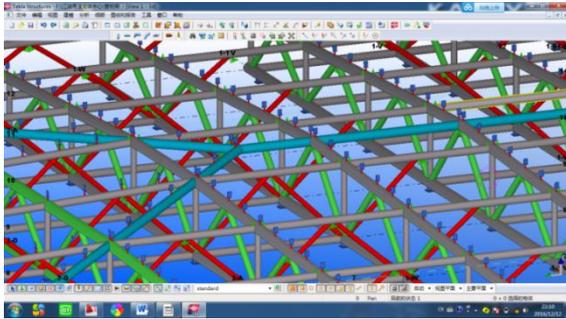
- ▶ Automatically name working code according to serial number
- ▶ Automatically optimize Tekla rough track curve
- ▶ Batch select batch output
- ▶ End face, holes, slots can be set separately and output at one time
- ▶ One-click generation of processing code
- ▶ Batch generation automatic numbering

2. Support end, hole, slot and bevel cutting

- ▶ Fixed angle beveling
- ▶ AWS fixed beveling



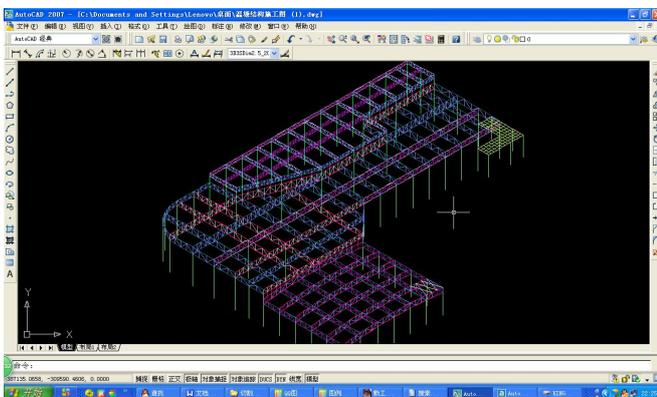
Layered display of multiple track curves



3.Support Secondary development of YOMI AUTOPIPE application on AutoCAD platform.

With the leading position in AutoCAD® drawing field and its powerful graphics function, it integrates the software function of YOMI AUTOPIPE pipe cutting machine, generates standard G code, connects with the eight-axis linkage YOMI CNC special-shaped pipe cutting system, realizes any type of interface cutting, and supports various kinds of modeling supports straight-cut function of circular arc tube.

The modeling is simple. From the software, through the center line, it is easy to establish the lap space grid structure of pipe, arc tubes, square tubes, rectangular tubes, plates, and other components.

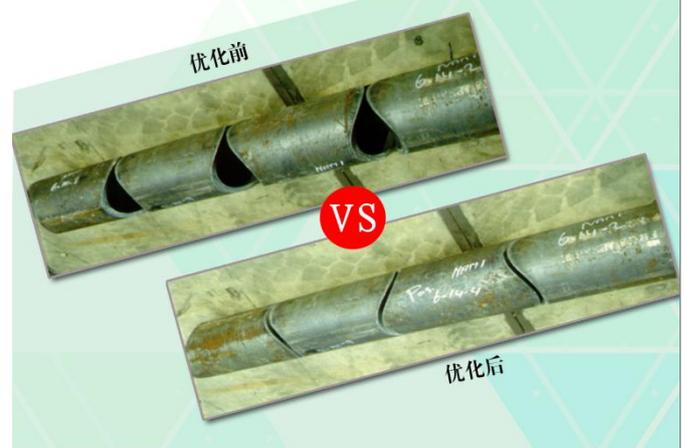
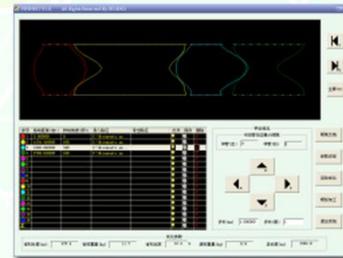


5.Pipe break,Mirror,Left<=>Right,G code



6.Pipe cutting nesting layout software--PipeNest

管材切割套排料软件——PipeNest

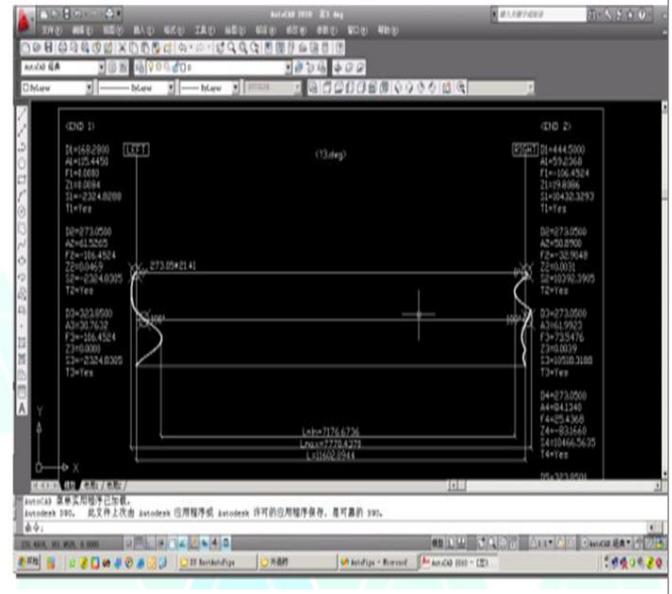


4. Nesting function: Super high nesting speed and utilization rate

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29			
STOCK-1	120.0	5.0	9600.0	136.1	17.1	0.2	99.82%																								
PIPE-1	120.0	5.0	1440.4	20.4	0.0	0.0	100.0%	Y-10.pip																							
PIPE-2	120.0	5.0	1238.9	17.6	0.0	0.0	100.0%	Y-5.pip																							
PIPE-3	120.0	5.0	1238.9	17.6	0.0	0.0	100.0%	Y-11.pip																							
PIPE-4	120.0	5.0	1440.4	20.4	0.0	0.0	100.0%	Y-10.pip																							
PIPE-5	120.0	5.0	1440.4	20.4	0.0	0.0	100.0%	Y-10.pip																							
PIPE-6	120.0	5.0	1545.0	21.9	0.0	0.0	100.0%	Y-6.pip																							
PIPE-7	120.0	5.0	1238.9	17.6	0.0	0.0	100.0%	Y-5.pip																							
STOCK-2	120.0	5.0	9600.0	136.1	32.9	0.5	99.60%																								
PIPE-1	120.0	5.0	1440.4	20.4	0.0	0.0	100.0%	Y-10.pip																							
PIPE-2	120.0	5.0	1238.9	17.6	0.0	0.0	100.0%	Y-5.pip																							
PIPE-3	120.0	5.0	1238.9	17.6	0.0	0.0	100.0%	Y-11.pip																							
PIPE-4	120.0	5.0	1238.9	17.6	0.0	0.0	100.0%	Y-5.pip																							
PIPE-5	120.0	5.0	1424.6	20.2	0.0	0.0	100.0%	Y-8.pip																							
PIPE-6	120.0	5.0	1545.0	21.9	0.0	0.0	100.0%	Y-6.pip																							
PIPE-7	120.0	5.0	1440.4	20.4	0.0	0.0	100.0%	Y-10.pip																							
STOCK-3	120.0	5.0	9600.0	136.1	56.4	0.8	99.41%																								
PIPE-1	120.0	5.0	1440.4	20.4	0.0	0.0	100.0%	Y-10.pip																							
PIPE-2	120.0	5.0	1238.9	17.6	0.0	0.0	100.0%	Y-1.pip																							
PIPE-3	120.0	5.0	1424.6	20.2	0.0	0.0	100.0%	Y-8.pip																							
PIPE-4	120.0	5.0	1238.9	17.6	0.0	0.0	100.0%	Y-5.pip																							
PIPE-5	120.0	5.0	1238.9	17.6	0.0	0.0	100.0%	Y-11.pip																							
PIPE-6	120.0	5.0	1545.0	21.9	0.0	0.0	100.0%	Y-6.pip																							
PIPE-7	120.0	5.0	1416.9	20.1	0.0	0.0	100.0%	Y-4.pip																							
STOCK-4	120.0	5.0	9600.0	136.1	48.7	0.7	99.49%																								
PIPE-1	120.0	5.0	1440.4	20.4	0.0	0.0	100.0%	Y-10.pip																							
PIPE-2	120.0	5.0	1424.6	20.2	0.0	0.0	100.0%	Y-8.pip																							
PIPE-3	120.0	5.0	1424.6	20.2	0.0	0.0	100.0%	Y-8.pip																							

7. Support Offshore AWS small angle cutting process

海工功能: 一键生成包含丰富信息的工程图



IX. Main configuration

Main Component Description

NO.	Main parts of machine	Brand & model	Manufacturer brand
1	Equipment body	YOMI	China
2	Industrial control computer	Advantech	China
3	Control system and software	YOMI	China
4	Servo drive motor	Panasonic servo	Japan

Pipe Cutting Special System

The system uses Pro-face's GP-2301HL handheld graphical operating interface. It has world-class safety protection functions: 3-position enable switch, 3-contact emergency stop switch, and vibration function;

System humanized graphical user interface; real 3D modeling and synchronous simulation; WYSIWYG(What you see is what you get) file processing; 3D toolpath simulation effect; compatibility with previous software of YOMI; classic menu structure of plane cutting machine; powerful function system debugging Tools; cost-effective mid-to-high-end pipe cutting machine control system.



X. Cutting Samples



According to processes requirements of customer, special off-center joints



Complex shape overlap angle cutting



The fluid pipe 90 degree orthogonal and 45-degree oblique, the inner and outer walls overlap the bevel cutting perfectly



Porous cutting of heat exchange unit pipes



Branch pipe reinforcement plate welding slot cutting



One main pipe multi-branch pipe intersecting bevel cutting



The inner and outer walls of stainless steel pipe are cut by water mist, the surface is smooth and clean, reducing slag and blackening



Multi-pipe intersecting bevel cutting



Multi-pipe combined inner and outer wall bevel cutting



Small angle AWS welding bevel cutting



One main pipe and multi-branch pipes intersecting bevel cutting



Pipes special-shaped bevel cutting



End beveling and middle round pipe are inserted obliquely up and down through opening and beveling, sloting and beveling to increase reinforcement of welding position, at the same time it meets beveling and cutting requirements of eccentric and symmetric hole.

XI. Terms of Service

▶ The data that comes with the machine

- Provide one set of technical information.
- Provide one set of operation manual.
- Provide one set of safe operating procedures.

▶ Machine acceptance requirements

- ▶ The machine fundation should meet the basic installation requirements.
- ▶ No large impact sources around the machine .
- ▶ There should be no welding defects such as cracks, blowholes, slag inclusions at all welds of the machine.
- ▶ All moving parts of the machine must not be loose or stuck
- ▶ All terminals and components in the electrical box must not be loose
- ▶ Check whether all safety protection devices work sensitively and reliably.
- ▶ Check all gas supply lines for leaks (soap liquid inspection method)
- ▶ The machine must be well grounded.

▶ Machine tool installation of customer site requirements (prepared by customer before equipment arrives)

NO.	Contents
1	Control system power supply capacity: not less than 15 KVA.
2	<p>Power requirements:</p> <p>(1) 3×380v±10%/50Hz, 220v±10%/50Hz</p> <p>(2) Three-phase voltage stability is less than ±5%</p> <p style="padding-left: 40px;">Three-phase power unbalance is less than 2.5%</p> <p>(3) Can not meet the above power requirements, it is recommended to use a regulated power supply</p> <p>Note: The power supply voltage is not allowed to have sudden jumps and sudden power failure, otherwise it is easy to cause damage to the equipment and CNC system and plasma power source; there must be a good ground (ground resistance less than 10 ohms)</p>
3	<p>Plasma power source working gas and auxiliary gas for cutting:</p> <p>Working gas: <u>air oxygen</u></p>
4	Cutting pipe: smooth, evenly rolled, ellipse deviation ≤1%, reaching ISO standard
5	CNC cutting machine installed place and the environment requirements.

	<p>(1) Temperature requirement: -10-50°C (2) Humidity requirements: <90% non-condensing</p> <p>(3) The site should fully meet the needs of equipment placement. It is recommended to isolate the plasma power source to avoid interference from the plasma power source to the system.</p>
6	<p>Flame cutting gas requirements</p> <p>Gas type: propane\acetylene\propene\natural gas.</p> <p>Gas pressure 0.05-0.1 MPa</p> <p>Cutting oxygen pressure 0.5-0.8 MPa</p> <p>Preheated oxygen pressure 0.4—0.6MPa</p>
7	<p>Equipment operators should have high school or technical secondary school education level, should have experience in operating computers and general CNC machine tools</p>
8	<p>Requirements for the installation of intersecting line programming software.1. According to the operating environment of the user's computer operating system, select the corresponding 32-bit or 64-bit AUTOCAD2010 version to install; 2. Install the Tekla19.0 or Tekla 2017 version 3D software; 3. Install the 32-bit or 64-bit EXCEL form according to the user's computer operating system environment .</p>

5 AXIS YM-5P

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Just Weld It



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