



1101 DZB  
CNC  
Drilling  
and  
Sawing  
Line

**TECHNICAL DESCRIPTION**

For the web and flange drilling of structural sections according to the following specifications:

***I-Beams***

Beam depth	Minimum	3-1/8"
	Maximum	40" (saw)
	Maximum	44" (drill)*
Flange height	Minimum	1-5/8"
	Maximum	17-3/4"

***Channels (with flanges oriented downward)***

Channel depth	Minimum	3-1/8"
	Maximum	40" (saw)
	Maximum	44" (drill)*
Flange height	Minimum	1-3/4"
	Maximum	11-3/4"

## TECHNICAL DESCRIPTION (continued)

### ***Angles***

Leg height (unequal legs as well)	Minimum	3-1/8" x 3-1/8" x 3/8"
	Maximum	10" x 10" x 1-9/16"

### ***Flats***

Width	Minimum	4"
Note: Requires tack welding of a small angle to the trailing end of the stock.	Maximum	40" (saw)
	Maximum	44" (drill)*

### ***Square Tubes***

Size	Minimum	3-1/8" x 3-1/8"
	Maximum	17-3/4" x 17-3/4"

### ***Rectangular Tubes***

Size	Minimum	3-1/8" x 1-9/16"
	Maximum	40" x 17-3/4" (saw)
	Maximum	44" x 17-3/4" (drill)*

\* Passage of members exceeding 40" in depth requires the removal of the horizontal saw clamps.

### ***All Beams***

Maximum thickness that can be drilled	3"
Maximum length that can be transferred	65 ft.
Minimum length to be transferred	8 ft.

### ***Drilling Capacities***

Drill heads	1
Spindles per drill head	1
Maximum hole diameter	2"
Spindle rotation motor per head (AC)	15 HP
Infinitely variable and programmable spindle speed for each spindle	180 - 2500 RPM

## TECHNICAL DESCRIPTION (continued)

### ***Band Sawing Unit Model 1045 BH***

Sawing capacity at 90°	Minimum	3-1/8" x 3/8"
	Maximum	40" x 17-3/4"
Sawing capacity at 45°		24-3/8" x 17-3/4"
Blade size (width x kerf)		1.61" x 0.051"
Band saw drive motor		7.5 HP
Programmable blade speed		65 – 328 FPM

### ***Other Specifications***

Maximum section weight as standard	11,900 lbs.
Maximum weight per foot as standard	300 lbs/ft not to exceed 11,900 lbs.
Maximum carriage speed	164 FPM
Passline	33-1/2"

**Note:** *Specifications are based upon mill tolerances per AISC standards.*

## MECHANICAL, ELECTRICAL, HYDRAULIC & PNEUMATIC GROUP DESCRIPTIONS

### **IC      *INFEEED CONVEYOR (FOR SECTIONS UP TO 65 FT IN LENGTH)***

#### **IC-1      *Carriage Supporting Structure***

The carriage supporting structure is suitable to handle sections up to 65 feet. The carriage supporting structure and carriage includes two separate rack and pinion assemblies. The larger is used to power the carriage and structural section on the conveyor and the smaller assembly provides positional feedback to the CNC control system.



#### **IC-2      *Carriage***



The carriage with material gripper is for longitudinal positioning of the section which is controlled by the CNC control. The gripper can be rotated and adjusted to clamp either the web or flange of the section. The arm can be lifted by the operator by means of a pushbutton control.

#### **IC-3      *Idler Conveyors***

Idler conveyors are used to support the section, suitably spaced to allow the eventual inclusion of transfer tables.

▶ Centerline of conveyor rolls	28-1/2"
▶ Roller diameter	4"
▶ Roller shaft diameter	1-3/16"
▶ Roller width (net)	40"

## **WU WORKING UNITS**

### **WU-1 Monospindle Rotating Drill Head**



One monospindle drill head complete with an automatic rotation device.

The spindle can be automatically oriented by the CNC to three angles —  $-90^{\circ}/0^{\circ}/+90^{\circ}$  — to process the top flange, the bottom flange and the web of the section without requiring the beam to be rotated. Rotational time for  $180^{\circ}$  is 0.7 second.



#### **Technical Specifications:**

- |  |                |
|--|----------------|
| ▶ Maximum drilling capacity in grade 50 material | 2"             |
| ▶ Flange gauge line                              | 3/8" – 17-3/4" |
| ▶ Web gauge line                                 | 3/4" – 39-1/4" |

The above drill head is supplied with:

- One 15 HP motor to ensure spindle rotation.
- Drill head positioning to the programmed web and flange gauge line is accomplished with a ball screw and servomotor controlled by the CNC.
- Drill feed system is accomplished with a ball screw and servomotor controlled by the CNC.

Each spindle is equipped with:

- Spindle probing to ensure rapid advance, drilling and rapid return of the drills. With this system, there is no need to adjust cams and it is also possible to use twist drills of different lengths to compensate for material distortion thus reducing the cycle time.
- Layout marks can be performed with the drill fitted into the spindle for drilling purposes by automatically changing the feed and speed functions in the program.
- Internal/external coolant system pneumatically operated.
- Automatic timed lubrication system reduces maintenance.

### **WU-2 Tool-Change System with Six (6) Positions**

The line is equipped with a tool-change system.

#### **Technical Specifications:**

- ▶ Adapter ISO 45
- ▶ Number of tools to be inserted 6



The changing of the tool and its selection is made automatically through the CNC program. Based upon the tool life parameters, the tools will automatically be changed to a tool of the same diameter when it is time for re-sharpening.

### **WU-3 Hydraulic Double Jaw Vise Assembly**

Automatic hydraulic double jaw vise assembly ensuring positive clamping of the workpiece during the drilling operation, both horizontally and vertically.

Clamping jaws can operate independently (fixed reference for the web on the beam flange). The clamping pressure of the roller clamping jaws automatically adjusts during the material positioning and drilling cycle. No special program functions are required.



The non-datum clamp is provided with an encoder so the vertical drill head positioning can be centered around the actual section depth. This feature also permits the web holes to be referenced from either flange.

## **SU SAWING UNIT**

### **SU-1 Band Sawing Unit Model 1045 BH — 40" Capacity**

Band sawing unit for the sawing of sections with the following characteristics:

- ▶ The bridge-type frame structure provides the maximum guidance of the saw blade throughout the cutting process.
- ▶ The cutting head is complete with the drive wheel assembly with gearbox, hydraulically adjustable idler blade wheel, an adjustable blade guide to accommodate different size sections and chip removal brush to clean the blade of chips as it exits the cut.
- ▶ System for structural section clamping.
- ▶ Base for saw mitering at +45°/-60° complete with angle positioning system with survey by means of the CNC.
- ▶ Spray mist blade lubrication/cooling system.
- ▶ Removable chip bin.



## **OC OUTFEED CONVEYOR (FOR SECTIONS UP TO 65 FT IN LENGTH)**

### **OC-1 Powered Conveyors**

Powered conveyors are used to support the section, suitably spaced to allow the eventual inclusion of transfer tables.

- |                                       |           |
|---------------------------------------|-----------|
| ▶ Centerline of conveyor rolls        | 28-1/2"   |
| ▶ Roller diameter                     | 4"        |
| ▶ Roller shaft diameter               | 1-3/16"   |
| ▶ Roller width                        | 40"       |
| ▶ A.C. drive motor, 2 traverse speeds | 49/98 FPM |

## ***HY HYDRAULIC AND PNEUMATIC SYSTEM***

### ***HY-1 Hydraulic Power Unit***

The system includes:

- Hydraulic power unit to generate the high pressure and low pressure for the working units and auxiliary circuitries.
- Hoses and connections.
- Circuitry for cooling with an air/oil heat exchanger.
- Hydraulic system on the machine complete with solenoid valves and hoses connected.

▶ Working Pressure 725 PSI

### ***HY-2 Pneumatic System***

The system consists of:

- Solenoid valves and related manifolds.

## ***EL ELECTRIC SYSTEM***

### ***EL-1 Interconnecting Machine Wiring***

### ***EL-2 Electrical Cabinet***

The electrical cabinet contains the power and control equipment for the unit's positioning axes and for the auxiliary services.

The standard equipment is manufactured according to established standards. Specific requests requiring both special rules and regulations will be considered upon the customer's request.

**The power supply is 460V – 60 HZ stepped up with a transformer to 550 V – 60 HZ – 3 Phases.**



## **CN FICEP ARIANNA CONTROL SYSTEM**

The new generation control unit, with required controlled axes, is based on a fieldbus CAN (Computer Area Network) open technology.

The CNC is positioned on a pedestal in a mobile control panel so that the operator can have a complete view of the machine.



All the input and output cards are connected to the bus and located on the machine. Also the electromechanical components and the drives (which enable the connection from the bus to the CNC) are located on the machine. In this way, the initial connection and start up are reduced to the minimum.

*The CNC is equipped with:*

- digital inputs (24V)
- digital outputs (24V)

The control panel is an industrial PC containing the CNC and having the following specifications:

- 850 Mhz Celeron CPU with 128 MB RAM, 10 GB HD, FDD
- Color video TFT 12.1"
- Keyboard panel and auxiliary pushbutton panel
- 10/100 RJ45 Ethernet port
- USB modem
- 4 serial ports RS232
- 1 parallel port
- 1 additional USB port to enable the connection with an external floppy drive (not included in this quotation)
- WINDOWS XP operating system

### ***Programming***

- Simplified data input (with tables and piece part on-screen graphics)
- Base line and hole to hole input
- Diameter input
- Simplified data input for symmetrical hole patterns

### ***Processing***

- Tool position tracking
- Automatic system offset
- Quantity tracking

### ***Execution***

- Automatic section length survey and re-calculation for the optimized accumulation
- Automatic cycle stop for setup, modification and on-screen indication of the tools to be changed
- Multi-tasking of the drill head with the automatic tool changer
- Automatic safeguards to prevent collision of the drills
- Drilling parameters table

*All the indications are clearly displayed on the screen, for example:*

- Current program indication with a clear description of the program running at the moment
- CNC inside and outside alarms
- Registration of the date and time of the last 100 alarm messages
- Diagnostic messages to the operator

### ***Diagnostics***

- The Arianna Control System incorporates extremely comprehensive diagnostic software that is uniquely tailored to the Ficep product line and their applications.

The user can utilize this capability directly or the system can be connected by a phone line to Ficep Corporation's technical support team located in Forest Hill, Maryland. From this remote location, our support staff can perform all the testing routines as if they were standing in front of the control such as:

- ◆ Review ladder logic
- ◆ Analyze past alarm messages that were generated
- ◆ Verify the part program
- ◆ Check hardware functionality at the board and component level
- ◆ Place remotely an oscilloscope on the respective servo drives to analyze their performance
- ◆ Remotely activate specific components such as valves to isolate and identify a faulty component

This diagnostic capability of the Arianna system translates into quick resolution of problems to reduce your downtime and to eliminate the time and cost after the warranty period to have a service technician visit your facility to diagnose a problem.

This service is without charge for as long as you own the Ficep product.

**PA STANDARD PAINTING**

The system is painted in the following standard colors:

- Light Grey RAL 7038
- Black Grey RAL 7021
- Yellow RAL 1028

**TD TECHNICAL DOCUMENTATION**

The system is supplied with the following technical documentation:

- Programming, maintenance, operator and instruction manual
- Electric schematics
- Pneumatic schematics

<b>SUPPLIED WITH FOLLOWING OPTIONS</b>
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**OWU- Automatic Web Probing**  
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Two web probes are provided to locate the underside location of the web so the flange hole patterns can be located automatically relative to the actual intersection of the web to the flange.

**OSU- Vertical Hold-Downs**  
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Two (2) vertical hold-downs for clamping of the section, one on each side of the blade.