Less Than One-Year Old FICEP A 102 Angle Line

TECHNICAL DESCRIPTION

Size of the material to be processed

Angle capacity based upon		
A-36 material / Tensile 65-70 (yield 55 ksi)	minimum maximum	1-1/8” x 1-1/8” x 1/8” 4” x 4” x 3/8”
Maximum punching capacity		55 Tons
Maximum shearing capacity (standard)		55 Tons
Maximum shearing capacity (with single cut shear [OWU-05])		110 Tons
Diameters available for each leg of the angle		1
Maximum diameter with standard tooling		1-1/4”
Diameter through thickness in A-36 material		1-1/4” through 3/8”
Maximum speed of the angle		131 FPM
Gauge line positioning speed		23 FPM
Length of section to be processed	minimum	33-1/2”
CNC axes		3
Minimum programmable increment	X axis Y axis Z axis	± 0,01 mm ± 0,01 mm ± 0,01 mm
Positioning tolerance within (*)		
Holes of the same pattern		± 0,5 mm

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TECHNICAL DESCRIPTION (continued)

Within holes or hole pattern positioned at
L distance (**L** measured in **meters**) ± 0,3 + (L x 0,14)

L in meters and accuracy in millimeters

Accuracy between two holes at L distance = ± 0,3 + (L x 0,14)

Considering a 49 ft. bar: 49 ft. = 14,9 meters — we will consider 15 meters
Accuracy = ± 0,3 + (15 x 0,14) = 2,4 mm = 0.0944" = ± 1/10"

Considering a 61 ft. bar: 61 ft. = 18,59 meters — we will consider 19 meters
Accuracy = ± 0,3 + (19 x 0,14) = 2,96 mm = 0,12" = ± 1/8"

EXAMPLE

(*) The above accuracies apply only to properly adjusted machines with sharp and correctly fitted tools and do not consider possible distortions of the section occurred during the working operations.

MECHANICAL, ELECTRICAL, HYDRAULIC & PNEUMATIC GROUP DESCRIPTIONS

WU WORKING UNITS

WU-01 Main Base for Working Units

This base can hold the two punching units, the shearing unit and the optional marking unit or versa press unit.

WU-02 Punching Units

Two fixed mounted hydraulic punching units — one unit to punch the one leg of the angle and second unit to punch the second leg of the angle. Each unit is equipped with quick-change punching holders to permit a punch and die change in seconds.

The positioning of each punching tool is accomplished with a ball screw and a servomotor to achieve an infinite number of gauge lines by selection from the program. Each press is fixed mounted to the table for maximum rigidity. Only the inner c-frame that contains the punch and die is positioned to the programmed gauge line. Each punching unit is equipped with multiple hydraulic hold-downs and strippers to clamp the angle securely during punching.

Main specifications of each punch station:

►Capacity		55 Tons
►Throat depth		3-1/2”
►Stroke		1-1/8”
►Maximum diameter with standard tooling		1-1/4”
►Maximum thickness		3/8”
►Gauge line stroke with respect to the inside of the angle leg	minimum	+3/8”
	maximum	+3-1/2”

Each punching unit is provided with one punch and die for the maximum hole diameter within the machine capacity.

Gage Line Limitations with Standard Tool Holders

Angle Size Range	*Minimum Gage*
1-1/4” to 2”	.63” plus the angle leg thickness
2-3/8” to 4”	1.04” plus the angle leg thickness

Gage Line Limitations with Optional Tool Holders

Angle Size Range	*Minimum Gage*
1-1/4” to 2-3/8”	1/2 the punch diameter plus 1/32” for a maximum hole size not to exceed .82”
1-3/8” to 2-3/8”	.65” plus the leg thickness for hole sizes from .82” to 1-3/16”
2-3/4” to 4”	1.02” plus the angle leg thickness

This special close gage line tooling holder uses American Punch style APS-7564 punches and F317 dies.

OWU-05 ***Single Cut Shear***

The shearing unit is made of one hydraulic single cut shear complete with hydraulic hold-down. The shear is furnished with one set of angle blades.

Shearing capacity

►Maximum available shearing capacity 110 Tons

WU-04 ***Angle Positioning and Measuring System***

The longitudinal angle positioning system is CNC controlled and composed of two devices (one at the infeed side of the punch units; one at the infeed side of the shear). Each device adjusts automatically to the material according to its mill tolerance and consists of rolls to support and transfer the angle and vertical hold-downs to ensure the angle is clamped securely and is always a true 90 degrees when measured to ensure accuracy as angle material can vary significantly. The roller feed drive and measuring systems float both vertically and horizontally to accommodate rolling mill deviations that differs from one bundle of angle to the next. This engineered solution eliminates the need to calibrate the measuring system when changing from one bundle of material to the next which has different characteristics. A servomotor controls the movement of the positioning roll with encoder feedback from the measuring rolls.

OC MATERIAL HANDLING

OOC-01/x Idler Infeed Table for 61 ft. Long Angles

Idler infeed table for the manual conveying of angles having a maximum length of 61 ft. The conveyor assemblies are complete with leveling screws for simple adjustment and installation. No field welding is required.

HY HYDRAULIC AND PNEUMATIC SYSTEM

HY-01 Hydraulic Power Pack

The system includes:

- Hydraulic power pack to generate the high and low pressure for the press cylinders and for the auxiliary circuitries.
- Hoses and connections.
- Cooling system with air/oil heat exchanger.
- Hydraulic system complete with solenoid valves and required hoses.

►Working Pressure (high)	2465 PSI
►Working Pressure (low)	725 PSI

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 **480 V – 60 HZ – 3 Phases.**

Note: Our equipment as quoted complies with the CE electrical code which is required for European manufactured machine tools. In the event that you require compliance with a special local electrical code, please provide the specifications so we can respond accordingly.

CN FICEP PEGASO CONTROL SYSTEM

The new generation control unit, with seven 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 - optoisolated)
- digital outputs (24V – protected transistors)
- analog inputs, analog outputs

The control system is an industrial PC that hosts the CNC, the PLC and the HMI. The power supply and the three CUPs (HMI, realtime and CANbus) are all mounted on a single board. Mass storage relies on solid state technology (flash memory) and the operating system image is write-protected against voltage dips or power losses.

Specifications:

HMI section (Human Machine Interface)

- 1.6 Ghz CPU dual core
- 2 GB DDR3 RAM with 512 kB x 2 L2 cache
- 8 GB compact flash
- 6 USB ports
- Touch screen color video LCD TFT 15”
- 10/100/1000 Mbit/s RJ45 Ethernet port
- Serial port RS232
- WINDOWS 7 embedded operative system

Realtime section

- Processor 800 Mhz ARM RISC 32 bit
- 1 MB PC dual port memory
- 128 kB CANbus dual port memory
- 128 MB RAM DDR2 memory

CANbus section

- Fujitsu processor with 3 CANbus controllers
- 1 MB flash memory

Programming

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

Processing

- Tool position tracking
- Automatic system offset
- Quantity tracking

Execution

- Automatic cycle stop for setup, modification and on-screen indication of the tools to be changed

3D Graphics

- Display of the piece in 2D
- Display of the piece in 3D. With this modality, operations such as pan and zoom are possible.

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 Pegaso 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 via the internet 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 Pegaso 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 7035
●Black Grey	RAL 7021
●Yellow	RAL 1028

TD TECHNICAL DOCUMENTATION

The system is supplied with the following technical documentation:

●Programming, maintenance, operator and instruction manuals

●Electric schematics

●Pneumatic schematics

SP SAFETY PROTECTIONS

SP-1 Protections on the Machine (Included)

SP-2 Outside Protections

Proper protection barriers, suitable to prevent the access of people to the working and material handling areas must surround the system. Such barriers need to be determined according to the system location inside your plant. Once you have determined what perimeter guarding would be desired, we are prepared to render an appropriate quotation.

ADDITIONAL FEATURES

OWU-03 Two (2) Quick Change Punch & Die Holders

An additional quick-change tool holder for the punch and corresponding die can be furnished as an option. The use of additional holders gives the operator the opportunity to change tooling in the holder with the line running. In competitive angle lines the buyer must decide when the line is ordered what type punch presses will be furnished. The decision is either to have the presses machined to accept a larger maximum hole size but with a larger minimum gage. The alternative is to have the presses machined to achieve tighter gage lines but at the sacrifice of a smaller maximum hole size.

The exclusive “Quick Change Punch and Die Holder” by FICEP gives the user total flexibility. If after the line is installed and the requirement for some tight gage line processing surfaces a second punch and die holder can be furnished. This die holder would be able to achieve extremely tight gage lines while sacrificing the maximum hole size capability, but just in this holder. When the tight gage line application is completed the tool holder is changed in seconds back to the original unit to now achieve a larger hole size capability.

OCN-03 Air Conditioner Units for Electrical Equipment

Two air conditioner units – one for electrical drive cabinet; one for CNC control. This accessory is necessary to use the system in extremely hot and humid climates.