

CNC Tube Bending Machine & its Software
(On Turn-key basis)

Code No. _____

Qty. – 03 Set

PURPOSE: CNC tube bending machine for bending of MS/Al/SS tubes.

SPECIFICATIONS:

SL. NO.	DESCRIPTION OF REQUIREMENT	REQUIRED
1	Scope	
1.1	Maximum tube size (D X t)	32 X 2 (mm) or more; Ferrous tubes
1.2	Minimum tube size (D)	8 mm or less
1.3	Maximum Bend radius	160 mm or more
1.4	Minimum Bend radius	1.5 D
1.5	Max. tube length for bending operation: At-least 3 meter	Vendor to confirm
1.6	Bend angle range	Up to 180°
1.7	Direction of bending	Left and Right
1.8	Pressure die operation	Electric
1.8.1	Motor Capacity	2 HP or more
1.9	Bending height	Min. 1000 mm
1.10	Offline programming (Bending, Drawing, Networking and Nesting) software for 3D graphic programming from offline computer with check for part feasibility and machine programme optimization	Vendor to confirm
1.11	Post-processor for 3D graphic programming on PC	Confirm
2	Tooling : Tool Set for MS/AL Tubes (including mandrel tie rods, dies and clamp brackets etc.) as per attached drawings for the bending parts	1 set each (Refer attached drawing)
2.1	MS Tube ERW-C1 (1 set)	17.08mm OD X 0.9 mm thk
2.2	MS Tube ERW-C1 (1 set)	19.05mm OD X 1 mm thk
2.3	MS Tube ERW-C1 (1 set)	22.23mm OD X 1.6 mm thk
2.4	MS Tube ERW-C1 (1 set)	25.4mm OD X 1.25 mm thk
2.5	MS Tube ERW-C1 (1 set)	25.4mm OD X 1.6 mm thk
2.6	MS Tube ERW-C1 (1 set)	28.6mm OD X 1.63 mm thk
2.7	ERW Steel tube STKM11A	19.5mm OD X 1 mm thk
2.8	ERW Steel tube STKM11A	25.4mm OD X 1 mm thk
2.9	Steel (JIS G3445) STKM11A	25.4mm OD X 1 mm thk
2.10	ERW Steel tube STKM11A	22.2mm OD X 1.4 mm thk
2.11	Aluminium 6061	25.4mm OD X 2 mm thk
2.12	Aluminium 6061	22.2mm OD X 2 mm thk
3	Axis controls (Ref. attached schematic)	
3.1	Carriage movement (X)	Min. 2000 mm
3.2	Bend angle (Y)	Min. 190°
3.3	Plane rotation of the tube (Z)	Up to ± 960°
3.4	Bend head rotation (R)	540°

3.5	Horizontal bend head movement (Q)	± 475 mm
3.6	Clamping right hand (W ₃)	Min. 165 mm
3.7	Clamping left hand (W ₅)	Min. 165 mm
3.8	Mandrel extraction (U ₂)	Max. 600 mm
3.9	Pressure die right hand (W ₄)	Min. 150 mm
3.10	Pressure die left hand (W ₆)	Min. 150 mm
3.11	Right follower die (U ₄)	Min. 120 mm
3.12	Left follower die (U ₅)	Min. 120 mm
4	Controller	
4.1	Control	Siemens SIMOTION / Fanuc / Equivalent OEM control (vendor to submit equivalency document)
4.2	Processor	Intel core i7 with min. 4 GB RAM, 32 GB solid state drive
4.3	Connection	Min. 2 Ethernet & 2 USB connections
4.4	Panel	Min. 12" colour monitor touch screen operator panel with keyboard
4.5	Digital drives	Siemens / Fanuc / ABB
5	Function which enables the automatic generation of bend compensation data including spring back compensation for specific material as per attached drawings	Confirm
6	Machine Speed, accuracy and stroke	
6.1	Maximum tube displacement axis speed (X)	At-least 1400 mm/sec
6.2	Displacement axis speed tolerance	± 0.05 mm
6.3	Maximum bending axis speed (Y)	At-least 300 ⁰ /sec
6.4	bending axis speed tolerance	± 0.05 ⁰
6.5	Maximum tube rotation axis speed (Z)	At-least 400 ⁰ /sec
6.6	tube rotation axis speed tolerance	± 0.05 ⁰
6.7	Maximum head horizontal displacement axis speed (Q)	At-least 800 mm/sec
6.8	head horizontal displacement axis speed tolerance	± 0.1 mm
6.9	Maximum head rotation axis speed (R)	At-least 120 ⁰ /sec
6.10	head rotation axis speed tolerance	± 0.05 ⁰
7	Other features	
7.1	Automatic Tube loading/ Unloading Station	Capacity 4 Ton or more
7.2	Ability to detect seam, hole slot and re-orient the bending line as per requirement	Confirm
7.3	Remote diagnostic capability (Machine should be capable of remotely connecting to OEM server and troubleshooting the problems to that)	Confirm
7.4	In-line tube punching up to 6 mm hole	Confirm
8	Detail of Necessary Lubrication and safety devices	Vendor to specify and confirm
8.1	Lubrication tank capacity	Min. 6 ltr.
9	Automatic die changing for bending of two different radius of same components and its accessories	Confirm
10	Following necessary accessories/spares for successful operation of machine, should be provided by vendor	Confirm

10.1	Proximities & Limit switches	02 Sets
10.2	CNC Panel Keys	02 Sets
10.3	Oil seals (all sizes)	01 Set
10.4	O rings	01 set
10.5	Timing belt	01 Set
10.6	Wiper dies	01 Set
10.7	Pressure dies	01 Set
10.8	Fuses	01 Set
10.9	Ferrules	01 set
11	Machine compliance with EC norms	Confirm
B	OTHER CONDITION	
12	Electrical System to be designed for	
12.1	3 Phase, 415V (\pm 10%)	Confirm
12.2	Frequency: 50 Hz (\pm 3%)	Confirm
12.3	Protection level	IP54 or better
13	Complete electrical system with tropicalization for Indian condition +5°C to +50°C temp and RH 100%	Confirm
14	Service: The authorized Service Partners (Name & Address) must be certified by manufacturer and shown in the quotation	Confirm
15	Machine to have capability to handle voltage and current fluctuation and power backup required for min 5 mins. for CNC control system	Confirm
16	Separate list of consumable.	Vendor to provide list along with cost
17	Supplier shall be undertaking of machine spares up to minimum 10 years.	Confirm
18	Vendor to Submit the detail layout of machine	Vendor to submit along with technical details
19	Documentation: Following documents (3 sets of hard copy and 1 set of soft copy) along with delivery will be required	Confirm
19.1	Operating instruction	Confirm
19.2	Installation and Commissioning instructions	Confirm
19.3	Quality Test records	Confirm
19.5	Preventive maintenance instructions	Confirm
19.6	Lubrication chart & parameter list	Confirm
19.7	Lifting instruction mentioned in packing list.	Confirm
19.8	Detailed invoice and packing list of all items and all other accessories enclosed in respective boxes	Confirm
20	Training at site	
20.1	Operation and Programming	1 Week
20.2	Preventive maintenance training	2 Days
21	Prove-out:	
11.1	Vendor to perform complete trial run and prove out	Confirm
11.2	Vendor has to prove-out on 5 complete sets at ALIMCO premises after installation and commissioning (Refer attached tender drawings).	Confirm
11.3	Vendor has to give cycle time of each component / drawing in writing	Confirm
12	Delivery period including installation and commissioning	6 months
13	Vendor to deliver machine at "ALIMCO Kanpur site"	Confirm

14	Packaging and Transportation is in scope of vendor	Confirm
15	Installation and Commissioning should be done within 21 days on receipt of machine at site by the vendor. All necessary calibrations shall be done by vendor before handover the machine.	Confirm

DELIVERY PERIOD INCLUDING INSTALLATION & COMMISSIONING:

The delivery period including installation & commissioning of the machines at the destination mentioned in Para 1 on page no. 02 of the tender documents will be 06 months from the date of placement of Purchase Order/work contract.

WARRANTY:

The machine inclusive of all system/accessories should be covered under warranty for a period of 24 months from the date of commissioning.

Note:

1. Machine shall be supplied with 3 sets of comprehensive operation and maintenance manual.
2. Breakdown calls to be attended within 72 hrs. Physically or through tele-diagnostic.
3. Civil foundation details and drawings with specifications to be provided by the tenderer.
4. Total power consumption (in kW) to be provided by the tenderer.
5. The BBT line for electricity has been provided at 8.5 meter height. Sufficient suitable cable, cable tray, Circuit breaker, fittings to connect the machine from power source is in Vendor's scope.
6. Compressed air pipeline is available in the work center, all necessary fittings, air dryer, air booster as per machine requirements, is in vendor scope.
7. Vendor to array any civil foundation work, if required, for the installation of machine.

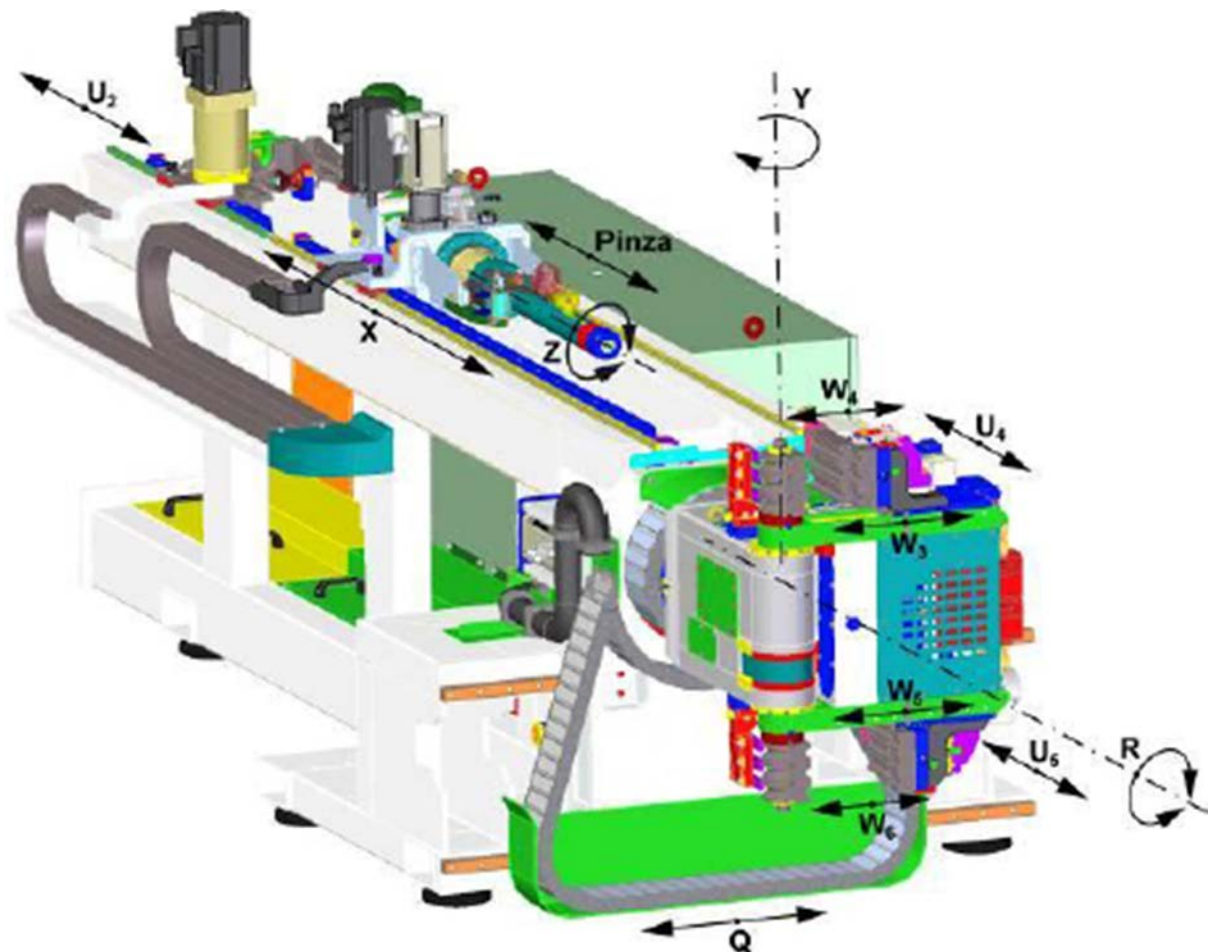


Fig.: Schematic of CNC Tube Bending Machine (for reference)