

SPECIFICATION FOR HYDRAULICALLY OPERATED TROLLEY FOR CNC CROPPING LINE IN BLOCK 2 ½ FOR TCB GROUP

Specification No.: MTD-TRM-59-10-316

1. GENERAL

The CNC Cropping line has been commissioned in Block 2 ½. A hydraulically operated trolley is required for loading CRGO coils on the CNC Cropping line, used for slitting CRGO steel lamination of the transformer cores. The slit coils will be kept on the wooden lined 'V' block of this trolley. This 'V' block will be moved up and down to align the center line of the coil with that of the mandrel. Then the trolley is moved forward so as to insert the core on the mandrel. The V block is then retracted and trolley returned to its original position.

2. CONFIGURATION

The hydraulically operated trolley is to be generally in line with our General arrangement Drawing no.: 3-MTD-06-2376 & 2381 enclosed. The V block shall have included angle of 150° and would have PU/wooden platens for supporting the job. The V block would have hydraulic cylinder mounted underneath on a frame and four guide pillars attached to it. The frame will have four wheels on two axles one of which will be driven by hydraulic motor. There will be four bushes on this frame which guide the four pillars attached to the V block. The cylinder would thus move V block up and down. A hydraulic power pack will be attached to the rear end of trolley. The pillar should be hardened and ground. The bushes should be made of phosphor bronze. The hydraulic cylinder should have sufficient capacity to support the weight of the V block and core. The structural frame and V block should be very rigid and made from elements such as channel plates, angles. Structure should be welded stress relieved and then machined to get correct alignment with the top four pillars. This trolley shall move on rails which will be embedded in concrete bed. The length of the rails should be around 7000 mm to get an stroke of around 6000 mm. Control panel & control pendant are to be mounted on the trolley itself. Cable reeling drum is to be fixed near the column and channel for guiding the cable to be embedded in the floor between the rails. Blinking light is to be provided on the trolley for safety purpose. TRM division will get the rail laid for the above project.

3. SPECIFICATION

- 1 Max. coil outside diameter-----1100 mm
- 2 Min. coil outside diameter-----450 mm
- 3 Max. Coil length -----1020 mm
- 4 Min. coil length ----- 100 mm
- 5 ID of coil (Min.) ----- 400 mm
- 6 OD of mandrel (min.) ----- 400 mm
- 7 OD of mandrel (max.) ----- 520 mm
- 8 Max. Coil weight -----5000 kg.
- 9 Up/down stroke -----450 mm
- 10 Max. travelling speed-----3000 mm/min.
- 11 Included angle of V block -----150°
- 12 Speed of vertical movement-----2000 mm/min.

13	Table traverse by-----	hydraulic motor/ Electrical geared motor
14	Power pack motor-----	5 HP, 1440 RPM
15	Types of cylinder -----	double acting
16	Cylinder bore -----	100 mm
17	Piston rod dia. -----	63 mm
18	Guide rod dia. -----	Min. 50 mm
19	Stroke of cylinder-----	~ 450 mm
20	Working pressure -----	~ 110 kg./cm ²
21	Max. working pressure-----	- 150 kg./cm ²
22	Distance between two rails -----	740 mm /Suitable
23	C.H of the mandrel from floor level -----	1600 mm
24	Capacity of oil tank -----	50 lts.

4. MAKE OF BOUGHT OUT ITEMS

- 1 Make of motors - Bharat Bijlee/ABB/Siemens only.
- 2 Make of pump - Dowty/Rexroth/Towler/Bosch only.
- 3 Make of Hyd. cylinder - Rexroth/Veljan/Wipro/Romheld/Parker/equivalent.
- 4 Make of Hyd. elements – Rexroth/ Bosch/Parker/Romheld/Towler only.
- 5 Make of Control elements - Siemens only.
- 6 Make of Limit switches - Siemens only.
- 7 Make of Cable reeling drum - Electromag only.
- 8 Make of gearbox - Bonfiglioli/Radicon/Elecon only.
- 9 Make of bearings - SKF/FAG only.

5. SCOPE OF SUPPLY

- 1 Hydraulic trolley with V block, cylinder, hydraulic motor, powerpack, cable reeling drum, etc as per our Specification No.: MTD-TRM-59-10-316. – 1 Lot
- 2 Control Panel & Pendant - 1No. Each
- 3 Mechanical kit comprising of Pipes, Hoses, Manifolds, Connectors, Valves, Brackets, fasteners, etc - 1 Lot
- 4 Electrical kit comprising of cables, conduit, ferrules, lugs, etc - 1 Lot
- 5 Operation and maintenance manual – 4 Sets.
- 6 Test & Guarantee certificates. – 4 Sets.
- 7 Spares for 2 years (Optional Ref. para 11) - 1 Lot

6. SCOPE OF WORK

- 1 Erection of trolley, cable reeling drum, panel etc.
- 2 Commissioning of hydraulic trolley
- 3 Proving of system

7. CONTROLS:-

All the power elements like contractors, relays, isolator switch, Induction lamps, etc are to be included in the control panel mounted at one end of the trolley.

Further, a separate control pendant is to be provided at the side of the trolley for enabling proper leveling & loading of coils. The pendant should have control ON/OFF,

FWD/REV & UP/DOWN, etc push buttons for the easy operation. Proper nomenclature & ferruling of the circuit is to be done & should be as per the circuits given.

8. DESIGN:-

Design of the system should be according to the latest standards keeping latest trends and developments in mind. Manufacturer may examine the existing CNC cropping line and design the system after seeing the site conditions. Before taking up manufacturing, the manufacturer should get the G.A. Drawing of their proposed system duly concurred by us. However, the responsibility of proving the system on our actual jobs would lie with the manufacturer.

9. LUBRICATION:-

Suitable arrangement for lubrication is necessary. Provision is to be made for the above by providing nipples etc. at strategic places wherever required.

10. ELECTRICALS:-

All electricals should have suitable safety devices such as Thermal / Overload trip devices, Current limiting devices, Electronic shear pin, Fuses, etc. Electrical power supply available is 415 V, 3Ø, 3 wire only at 50 Hz. (No neutral is available). Hence, if there's any requirement of 220 / 110 Volts, suitable transformers may be incorporated.

All wiring to be suitably numbered / ferruled for easy maintenance. All electrical components should be of Siemens make only.

ICTP to be included in the Panel as the supply shall be given at this point. Cable from supply point to ICTP on Panel shall be in BHEL scope. All other cabling / wiring is to be done by the supplier.

11. SPARES:-

Necessary spares such as bearings, couplings, pinions, a set of worm & worm wheels and other items for successful running of system for at least 2 years should be quoted separately, as optional.

12. PAINTING:-

The trolley is to be painted after Red oxide primer with heat resistant paint of Yellow & Black Colour strips, as per IS Standards of industrial trolleys.

13. GUARANTEE:-

The system should be guaranteed for successful and reliable performance and for free replacement of faulty material or components / defective workmanship for a period of 12 months from the date of commissioning.

14. SAFETY:-

Structure should be stable and should not fall / collapse / bulge causing any harm to the surroundings. Wherever desirable edges should be strengthened and rounded to remove

sharpness. The system should be provided with suitable safety devices to guard the system from any damage and also for the safety of the operator. Relevant safety standards are to be followed. Testing of the system under test load is to be demonstrated during inspection.

15. INSPECTION & SYSTEM CHECKS:-

Inspection of the system will be carried out at the manufacturer's works prior to dispatch of the system for satisfactory performance of the system and for the accuracies mentioned in this specification. Broadly following items shall be checked before despatch:

(a) Scope of Supply. (b) Make / Rating of all BO components such as Motor / Gearbox / Chains etc. (c) Workmanship. (d) Ergonomics. (e) Structural Stability. (f) Joint Strength. (g) Maintainability. (h) Controller Layout / Components used / Tolerance level built-in. (i) Dimensional checks. (j) Load / No-load trials as far as possible.

16. LITERATURE:-

Four copies of Operation & Maintenance manuals, Test & Guarantee Certificates, General Arrangement drawings, Electrical circuit diagrams, Lubrication charts are to be supplied with the system.

17. INSTALLATION, COMMISSIONING AND PROVING FOR PERFORMANCE:-

The installation, commissioning and proving of the system for desired performance on our actual jobs is to be done by the supplier at our works. Supplier may quote charges for the above separately.

Manufacturer should comply with the following during Erection, Commissioning and Proving:-

- (a) Experienced & qualified team headed by a team leader fully conversant with the work scope should only be deputed. Labours, if required should be brought or arranged locally.
- (b) E & C work has to be completed in one go except where it is agreed with mutual consent.
- (c) Drawings related to civil work should be sent to BHEL atleast 8 weeks in advance.
- (d) Any help required from BHEL during E & C has to be indicated in the offer itself. Except where agreed, rest has to be organised by the manufacturer should arrange required hand tools etc.
- (e) Manufacturer's team is required to comply with general discipline, industrial safety rules and workshop norms while doing the work. Any work with safety hazards etc should not be done in any case. No work should be done without proper authorization or permission.

18. DETAILS TO BE INCLUDED WITH THE OFFER:-

Following details must be supplied with the offer:-

- a) Only parties having atleast one year of experience of supplying similar hydraulically operated trolley need to quote.
- b) Full technical details / specifications, general arrangement drawing, electrical schematics, etc.
- c) Control diagrams illustrating construction of the system / equipment.
- d) Material specifications which are used in the manufacturing of the equipment.
- e) Overall dimensions and space requirements.
- f) Power and compressed requirements.
- g) List of customers to whom similar / identical system / equipment have been supplied.

- h) Point wise reply to each & every point of our specification is a must. It not complied, your offer will not be considered.

19. OTHER UTILITIES AVAILABLE WITH BHEL-BHOPAL:-

Compressed air available at 4 Kg / Sq. cm (Max.) and regular water supply.

20. AMBIENT CONDITION & TROPICALISATION:-

All electronic components should be tropicalised to withstand environmental temperature variation from 4 ° C to 50° C and Relative Humidity variation from 5% to 95 %.

21. STRESS RELIEVING OF ALL FABRICATED ITEMS:-

All fabricated basketries are to be Stress relieved.

22. MATERIAL & HEAT TREATMENT FOR MAJOR COMPONENTS:-

All wear components (in motion) needs to be properly Heat treated for maximum durability.

23. TRAINING:-

Training should be imparted to our Operators and Maintenance people for 4 - 5 days so that they should be in a position to run / maintain the system, independently.

