

## Specification of Strip Locking Device (IMM Range)

Deptt: IMM  
Item No. :  
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- 1. Introduction:** The Strip Locking device consists of two main sub systems (i ) Strip locking device (ii) Umbrella press. The machine is required for locking of strips in the stator core of the electric motors. The stator core is built from laminations which are assembled together and pressed. After pressing and consolidation, the strips are pressed into the slot on the OD of the Stator core and strips are locked finally. This results into consolidation of the stator punchings and stator core is prepared.  
For the purpose of the pressing of strip, a roller is used to press the strip. The roller is pushed onto the strips by a hand wheel and lead screw. The block containing the roller also travels vertically, thus locking the strip fully. After this the strip pressing unit is indexed to the next strip slot. All along this operation, the umbrella press is keeping the stack pressed.

The vertical motion of the strip pressing roller is effected by motorised screw & nut system.

The rotation/ indexing of the strip locking column on the circular bearing is effected by hand wheel which rotates the gears under the rotary table and thus effects the motion of rotary table.

The umbrella press consists of a large capacity hydraulic cylinder with a long ram and a hydraulic power pack. The ram has got a rectangular slot through which the cotter is pushed. The cotter exercises pressure on the pressure plate which distributes the force on all over top face surface area.

Since the slot width is changing, the front roller should be interchangeable.

- 2. Job size**
  - (a) Max job OD – 1250 mm
  - (b) Max job ht- 1700 mm
  - (c) Max slot width- 30 mm
  - (d) Min slot width – 25 mm

### 3. Tech specs of the machine/equipment

- |  |  |
|--|--|
| (a) Force exerted by ram of umbrella press     | - 150 Tonnes   |
| (b) Stroke of ram of umbrella press            | - 800 mm   |
| (c) Stroke of horizontal lead screw            | - suitable to cater to the range of diameters                                |
| (d) Force to be exerted by the Hor. Lead screw | - 4000 Kgs approx.   |
| (e) Column ht                                  | - suitable   |
| (f) Vertical stroke of hor. Pressing unit      | - suitable for height of job + 50 mm on lower side and 50 mm on higher side. |
| (g) Upward velocity of the ram                 | - 500 mm/min or suitable   |
| (h) Downward velocity of the ram               | - 120 mm/min or suitable   |
| (i) Piston Rod dia.                            | - supplier to specify.   |
| (j) Base of Ram Cylinder                       | - Supplier to specify.   |
| (k) Max Working Pressure                       | - 250 Bar approx/suitable  |
| (l) Motor Rating                               | - Supplier to specify.   |

Note : Upward and downward, high speed operation should be possible for initial travel.

### 4. Accuracy :

- |   |                  |
|---|------------------|
| (a) Hor motion of pressing cylinder               | - within 0.2 mm  |
| (b) Perpendicularity of column w.r to press table | - 0.4 mm total   |
| (c) Circular Guide way Table                      | - ONE nO         |
| (d) Vertical straightness of the column           | - within 0.2 mm  |
| (e) Roller edge straightness                      | - within 0.03 mm |

### 5. Safety :

- (a) Suitable safety arrangement for the safe operation of various components should be made in the press
- (b) Suitable safety arrangement for the working persons around must be kept in the system

### 6. Electrical supply :

- (a) 415 VAC, 3 phase, 3 wire, No neutral (+/- 10 %)
- (b) 50 Hz +/- 3 % Frequency

## **7. Scope of supply**

- (a) Umbrella press- one No
- (b) Column – one No.
- (c) Table - one No.
- (d) Hyd. Control desk with suitable electrics – One No
- (e) Hydraulic power pack – One No
- (f) Any other item reqd. to make system complete – One set.

## **8. Predespatch inspection & duration:**

Predespatch inspection shall be done for a period of 4 days to test various functions , workmanship etc of the equipment

9. **Transport** : suitable transporter to be arranged by the Supplier for door delivery of the machine. Transport cost to be quoted separately.

10. **Incoming inspection at BHEL Bhopal** : Supplier to depute his representative for incoming inspection of the material when it is received in BHEL Bhopal works

## **11. Erection/ installation/ Commissioning and start up/ Job proving :**

Supplier to do complete erection and commissioning of the equipment at our works and prove the equipment for desired performance.

## **12. Civil foundation :**

Civil foundation design shall be given by the supplier giving all reinforcement details. BHEL's civil department shall make the foundation as per the civil foundation design.

## **13. Experience/ qualifying criteria**

Supplier should have experience in mfg hyd umbrella presses/ presses to the force rating specified and one such equipment must be working in the field for the period of one year after commissioning and also must have mechanical design engineers for the design of the system.

## **14. Hydraulic/ Penumatics/ Compressed air**

The hydraulic items shall be M/s Bosch , M/s Yuken, M/s Vickers, M/s Rexroth make only. Compressed air system should be from Shavo Norgren, Martonair. Oil sump must be of suitable capacity to avoid heating of the oil (else suitable cooler to be incorporated)

Hydraulic power pack should have two independent pumps for providing fast and slow speed operations. The power pack should have sufficient quantity of oil and should have all necessary components such as (a) Air breather cum filter (b) inlet filter (c) outlet filter (d) pressure relief valve (e) pressure setting valve (f) pressure gage (g) isolation valve (h) Direction control valves (i) flow control valves (j) non return valves etc . Cooler, if required may be incorporated.

Existing operation and equipment may please be studied.

All electrical items should be from Siemens.

15. **Control Panel:** Suitable controls should be incorporated in the system.

- (a) on/off of hydraulic power pack
- (b) setting of pressure for main ram
- (c) setting of flow controls (forward and reverse for ram)
- (d) setting of flow controls (forward and reverse for ram)
- (e) push button for upwards motion of the pressing cylinder (inch, hold type)
- (f) push button for downwards motion of the pressing cylinder (inch, hold type)
- (g) up motion of ram (inching, Hold type)
- (h) down motion of ram (inching, Hold type)

16. **Design Approval :** Supplier to present the design drawing to BHEL after placement of the order for concurrence.

17. **Guarantee :** 24 months guarantee after commissioning is required.