



# BHARAT HEAVY ELECTRICALS LIMITED

( A Government of India Undertaking )  
HIGH PRESSURE BOILER PLANT  
PURCHASE DEPARTMENT - FOSSIL BOILERS  
THIRUCHIRAPALLI - 620014  
TAMILNADU (INDIA)

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GRAMS : BHARATELEC  
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E-mail: srchandran@bheltry.co.in  
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429-002/A

	<b>Enquiry No</b>	<b>Enquiry Date</b>	<b>Due Date for Quotation</b>
	2661400765 - 55	20.10.2014	17.11.2014
Please quote Enquiry No, Date and due date in all correspondences. This is only a request for quotation and not an order			

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	7512A2301100 Hydraulic Cylinder as per Drg. 4M-12A-23-29238. Specifications: Type: Double Acting Hyd Cylinder - welded construction, Cylinder Bore dia.: 40 mm, Piston Rod dia. 28 mm, Stroke: 120 mm, Mounting and over all dimensions As per drawing No. 4M-12A-23-29238, Maximum operating pressure: 320 Bar. Common Specifications for Sl.No. 10, 30, 50, 70, 90, 110, 130, 150, 170, 190, 210, 230: 1.Piston rod should be hard chrome plated to 55 HRC (min) and 40 microns thick (min), 2.Seal arrangement should follow as: Double acting piston seal (Step seal)- with Back-up ring and guide strips on both sides. Rod Seals in Gland Nuts, along with Wiper seal. Common Specifications for Sl.No. 10, 20, 40 to 160, 180 to 230: Seal Kit arrangement should follow as: Double acting piston seal (Step seal)- with Back-up ring and guide strips on both sides. Rod Seals in Gland Nuts, along with Wiper seal. NOTE FOR SL.NO. 10 to 240: (1)The successful vendor should provide the detailed drawings, cross sectional assembly drawing of cylinders with its complete dimensions ,material of construction, mean cushioning pressure to be specified by the offerer (if required for that cylinder) and standard wear resistant sealing arrangements and bill of materials with Makes and Part number to BHEL for approval before manufacturing. Bore Inner diameter shall be standard size suitable to seals which shall be designed by supplier and shall get necessary approval from BHEL engineers before manufacturing. (2)Both Rear and front end cushioning, air	NO	2.000	2.00	17.01.15

The offers should reach us 30 minutes before the time of opening of tenders.  
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening.Late and delayed offers are liable to be rejected.

Yours faithfully,  
For **BHARAT HEAVY ELECTRICALS LIMITED**  
  
MANAGER / PURCHASE  
(FOSSIL BOILERS)  
Yours faithfully,



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bleeding ports (if required), Breakaway pressure shall be included in the cylinder based on its application while quoting itself for technical evaluation.

(3)Cylinder bore to be honed to a surface finish not less than 20 micro inches (or) Ra 0.6 to Ra 0.4, Piston rod should be hard chrome plated to 40 microns (min) and 55 HRC (min) hardness.

(4)Latest wear resistant sealing arrangement and only standard size seals of Bushak Shamban / Merkel / Parker / Simrit Freudenberg / Hunger/ Hallite / James Walker makes only acceptable other makes are liable for rejection.

(5)Test certificates for hydraulic pressure testing, material, hardness and thickness of chrome plating to be submitted during Pre-dispatch inspection.

(6)Warranty shall be provided for 12 months from the date of installation or 18 months from the date of supply, whichever is earlier.

(7)Standard: NFPA/JIC/ISO standards only acceptable and standard to be mentioned by the offerer while quoting.

(8)Materials for construction for all the components are as follows(OR ITS EQUIVALENT ACCEPTABLE TO BHEL ENGINEERS)

CYLINDER TUBE (SEAMLESS) : ST52  
PISTON ROD OR RAM : ST52  
PISTON : ST52  
LOCK NUT : EN 24  
END COVERS/FLANGES : EN 8/EN 24  
FASTENERS HIGH TENSILE GRADE: 10.9/12.8  
STANDARD SEALS :  
PU/PTFE/VITON OR ITS COMBINATION IN THE  
Makes as per SI.No: 4.

(9)Supplier may visit the site to get acquaintance about the machine and its operation before quoting.

(10)All formed threads shall be ensured with standard GO and NO GO gauges, Ring gauges so as to match in the existing arrangement in machine (if required). The same has to be ensured by the supplier in pre dispatch inspection.

(11)The cylinder assembly to be tested to a pressure of 1.5 times working (max) pressure as specified under each item at supplier's works for a holding time of minimum 3 minutes at both ends and intermediate position for leak free sealing. The supplier should provide all the

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facilities for testing at suppliers work to BHEL engineer for pre-dispatch inspection.

(12)Point by point confirmation is required for technical evaluation.

(13)Offer shall be submitted in Two Part bid system.

#### VENDOR QUALIFYING CRITERIA

1.,,The vendor should have minimum TWO years experience in Manufacturing of Double acting Hydraulic cylinders.

2.,,The vendor should submit relevant documents like purchase order copies and performance certificate for trouble free working of minimum one year with details of contact person of customer for previous orders executed.

3.,,The vendor should have experience in manufacturing of Double acting Hydraulic cylinders with working pressure not less than: 320 bar and Test pressure : 700 bar. Vendor to provide sample details of Hydraulic cylinder supplied recently.

4.,,Vendor should have well established manufacturing plant with testing facility for manufacturing of hydraulic cylinders of specified capacity

5.,,Guarantee certificate for minimum 12 months of trouble free performance from the date of acceptance to be confirmed by the vendor.

6.,,Bhel reserves the right to visit the vendor's works at any time for verifying the manufacturing facilities and any other credential furnished by the vendor in case the information furnished with the offers found to be false /incorrect, the offer shall be rejected.

20	7512A2301200	SET	3.000	3.00	17.01.15
Seal kit suitable for cylinder bore 40 mm as per Drg: 4M-12A-23-29238. One Set consisting of Piston seal 1 set and Rod seal 1 set for gland nut. NOTE: FOR ITEM.NO. 10 AND 20 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.					
30	7512A2301300	NO	2.000	2.00	17.01.15
Hydraulic Cylinder as per Drg. 3M-12A-23-14879. Specification: Type: Double end Piston rod Hyd Cylinder, Cylinder Bore dia.: 250mm, Piston Rod dia. 140 and 170 mm, Stroke: 100					

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mm, Mounting and over all dimensions As per drawing No. 3M-12A-23-14879, Maximum operating pressure: 320 Bar, Seal Kit arrangement should follow as: Double acting piston seal (Step seal)- with Back-up ring and guide strips on both sides. Rod Seals on both ends, along with guide strips and Wiper seals.  
NOTE: FOR ITEM.NO. 30 AND 40 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.

40	7512A2301400	SET	4.000	4.00	17.01.15
Seal kit suitable for cylinder bore 250 mm as per Drg: 3M-12A-23-14879. One Set consisting of Piston sealkit 1 set and 2 sets of Rod sealkits for 140 and 170mm rod ends.					
50	7512A2301500	NO	2.000	2.00	17.01.15
Hydraulic Cylinder as per Drg. 4M-12A-23-29236. Specification: Type: Double Acting Hyd Cylinder- welded construction, Cylinder Bore dia.: 50mm, Piston Rod dia.: 35mm, Stroke: 350 mm, Cushioning: On both ends, Mounting and over all dimensions As per drawing No. 4M-12A-23-29236, Maximum operating pressure: 210 Bar. NOTE: FOR ITEM. NO. 50 AND 60 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.					
60	7512A2301600	SET	3.000	3.00	17.01.15
Seal kit suitable for cylinder bore 50 mm as per Drg: 4M-12A23-29236. One Set consisting of Piston seal 1 set and Rod seal 1 set for gland nut.					
70	7512A2301700	NO	2.000	2.00	17.01.15
Hydraulic Cylinder as per Dwg. 4M-12A-23-29234-01. Specification: Type: Double Acting Hyd Cylinder- welded construction, Cylinder Bore dia.: 100mm, Piston Rod dia.: 70mm, Stroke: 360 mm, Cushioning: On both ends, Mounting and over all dimensions As per drawing No. 4 M-12A-23-29234-01, Maximum operating pressure: 210 Bar. NOTE: FOR ITEM.NO. 70 AND 80 ARE MATING					

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PARTS. HENCE THESE ITEMS SHOULD  
BE PROCURED FROM SINGLE SOURCE ONLY.

80	7512A2301800 Seal kit suitable for cylinder bore 100 mm as per Drg: 4M-12A-23-29234-01. One Set consisting of Piston seal 1 set and Rod seal 1 set for gland nut.	SET	3.000	3.00	17.01.15
90	7512A2301900 Hydraulic Cylinder as per Dwg. 4M-12A-23-29240-02. Specification: Type: Double Acting Hyd Cylinder- welded construction, Cylinder Bore dia.: 60mm, Piston Rod dia.: 40mm, Stroke: 335 mm, Mounting and over all dimensions As per drawing No. 4M-12A-23-29240-02, Maximum operating pressure: 210 Bar. NOTE: FOR ITEM.NO. 90 AND 100 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	2.000	2.00	17.01.15
100	7512A2302000 Seal kit suitable for cylinder bore 60 mm as per Drg: 4M-12A-23-29240- 02. One Set consisting of Piston seal 1 set and Rod seal 1 set for gland nut.	SET	3.000	3.00	17.01.15
110	7512A2302100 Hydraulic Cylinder as per Dwg. 4M-12A-23-29239. Specification: Type: Double Acting Hyd Cylinder- welded construction, Cylinder Bore dia.: 250mm, Piston Rod dia.: 140mm, Stroke: 190 mm, Mounting and over all dimensions As per drawing No. 4M-12A-23-29239, Maximum operating pressure: 320 Bar. NOTE: FOR ITEM. NO. 110 AND 120 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	1.000	1.00	17.01.15
120	7512A2302200 Seal kit suitable for cylinder bore 250 mm as per Drg: 4M-12A-23-29239. One Set consisting of Piston seal 1 set and Rod seal 1 set for gland nut.	SET	3.000	3.00	17.01.15

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Item No	Description	Unit	Quantity	Unit Price	Amount
130	<b>7512A2302300</b> Hydraulic Cylinder as per Dwg. 4M-12A-23-29246. Specification: Type: Double Acting Hyd Cylinder- welded construction, Cylinder Bore dia.: 200mm, Piston Rod dia.: 125mm, Stroke: 1275 mm, Mounting and over all dimensions As per drawing No. 4M-12A-23-29246, Maximum operating pressure: 210 Bar, Piston rod material: #20MnV6/St52 - 30/20mu nickel/hard chrome plated. NOTE: FOR ITEM. NO. 130 AND 140 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	1.000	17.01.15	17.01.15
140	<b>7512A2302400</b> Seal kit suitable for cylinder bore 200 mm as per Drg: 4M-12A-23-29246. One Set consisting of Piston seal 1 set and Rod seal 1 set for gland nut.	SET	2.000	17.01.15	17.01.15
150	<b>7512A2302500</b> Hydraulic Cylinder as per Dwg. 4M-12A-23-29241. Specification: Type: Double Acting Hyd Cylinder- welded construction, Cylinder Bore dia.: 50mm, Piston Rod dia.: 35mm, Stroke: 370 mm, Mounting and over all dimensions As per drawing No. 4M-12A-23-29241, For two cylinders - Hyd ports orientation as per Drg and for other two cylinders - Hyd ports orientation is at 90deg w.r.to Drg. Maximum operating pressure: 320 Bar. NOTE: FOR ITEM. NO. 150 AND 160 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	4.000	17.01.15	17.01.15
160	<b>7512A2302600</b> Seal kit suitable for cylinder bore 50 mm as per Drg: 4M-12A-23-29241. One Set consisting of Piston seal 1 set and Rod seal 1 set for gland nut.	SET	4.000	17.01.15	17.01.15
170	<b>7512A2302700</b> Hydraulic Cylinder as per Dwg. 4M-12A-23-29245. Specification: Type: Double Acting Hyd Cylinder- welded	NO	2.000	17.01.15	17.01.15

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BOOSTER CYLINDER ASSY. AS PER DRAWING  
NO. 3M-12A-02-7780 IN  
ASSEMBLED CONDITION. ( SUB ASSY DRG  
NO. BOOSTER CYLINDER = 3M-12a-02-  
7684, PISTON ROD = 4M-12a-02-19401,  
STUFFING BLOCK = 4M-12a-02-19178,  
PISTON = 4M-12a-02-19402, RETAINER =  
4M-12a-02-19403 ).

**General Note:**

GENERAL NOTE:PLEASE SUBMIT YOUR OFFER IN "TWO PART BID SYSTEM"AS PER THE  
ANNEXURES ENCLOSED.

ENCLOSURES:ANNEXURE II,III,IV,V,VI,VII.

**Enclosures:**

"LD clause has to be confirmed without fail."

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	Type: Double Acting Hyd Cylinder- welded construction, Cylinder Bore dia.: 80mm, Piston Rod dia.: 45mm, Stroke: 52 mm, Mounting and over all dimensions As per drawing No. 4M-12A-23-29242, Maximum operating pressure: 320 Bar. NOTE: FOR ITEM. NO. 210 AND 220 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.				
220	7512A2303200 Seal kit suitable for cylinder bore 80 mm as per Drg: 4M-12A-23-29242. One Set consisting of Piston sealkit 1 set and Rod sealkit 1 set for gland nut.	SET	4.000	4.00	17.01.15
230	7512A2303300 Hydraulic Cylinder as per Dwg. 4M-12A-23-29237. Specification: Type: Double Acting Hyd Cylinder- welded construction, Cylinder Bore dia.: 50mm, Piston Rod dia.: 28mm, Stroke: 70 mm, Mounting and over all dimensions As per drawing No. 4M-12A-23-29237, Maximum operating pressure: 210 Bar. NOTE: FOR ITEM. NO. 230 AND 240 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	4.000	4.00	17.01.15
240	7512A2303400 Seal kit suitable for cylinder bore 50 mm as per Drg: 4M-12A-23-29237. One Set consisting of Piston sealkit 1 set and Rod sealkit 1 set for gland nut.	SET	4.000	4.00	17.01.15
250	7512A0200500 HYDRAULIC JACK FOR CLAMPING DIE AS PER DRAWING NO. 2M-12a-02-0366 IN ASSEMBLED CONDITION. ( SUB ASSY DRG NO. CYLINDER = 3M-12a-02-0990, PISTON ROD = 4M-12a-02-17385, PISTON = 4M-12a-02-2387, STUFFING BLOCK = 4M-12a-02-2388, SEALING NUT = 4M-12a-02-2389, EYE PICE = 4M-12a-02-2390, BOSS = 4M-12a-02-2391, SEALING RING = 4M-12a-02-2399, "O" RINGS = 4M-12a-02-5345 ),	NO	2.000	2.00	17.01.15
260	7512A0201700	NO	1.000	1.00	17.01.15

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construction, Cylinder Bore  
dia.: 160 mm, Piston Rod dia.: 110 mm,  
Stroke: 450 mm, Mounting and  
over all dimensions As per drawing No.  
4M-12A-23-29245, Maximum  
operating pressure: 320 Bar, Piston rod should  
be hard chrome plated to  
55 HRC (min) and 40 microns thick (min) with  
Air Breather of 1/4" size.  
Seal Kit arrangement should follow as:  
Seals shall be of LOW FRICTION type. Double  
acting piston seal (Step  
seal)- with Back-up ring and guide strips on  
both sides. Rod Seals in  
Gland Nut, along with Wiper seal.  
NOTE: FOR ITEM. NO. 170 AND 180 ARE  
MATING PARTS. HENCE THESE ITEMS  
SHOULD BE PROCURED FROM SINGLE SOURCE  
ONLY.

180	7512A2302800 LOW FRICTION SEAL KIT, Seal kit suitable for cylinder bore 160 mm as per Drg: 4M-12A-23-29245. One Set consisting of Piston seal 1 set and Rod seal 1 set for gland nut.	SET	4.000	4.00	17.01.15
190	7512A2302900 Hydraulic Cylinder as per Dwg. 4M-12A-23-29243. Specification: Type: Double end piston rod Hyd Cylinder, Cylinder Bore dia.: 140mm, Piston Rod dia.: 100mm, Stroke: 350 mm, Mounting and over all dimensions As per drawing No. 4M-12A-23-29243, For two cylinders - Hyd ports orientation as per Drg and for other two cylinders - Hyd ports orientation is at 90deg w.r.to Drg. Maximum operating pressure: 320 Bar. NOTE: FOR ITEM. NO. 190 AND 200 ARE MATING PARTS. HENCE THESE ITEMS SHOULD BE PROCURED FROM SINGLE SOURCE ONLY.	NO	2.000	2.00	17.01.15
200	7512A2303000 Seal kit suitable for cylinder bore 140 mm as per Drg: 4M-12A-23-29243. One Set consisting of Piston sealkit 1 set and Rod sealkit 2 sets for gland nuts on both ends.	SET	4.000	4.00	17.01.15
210	7512A2303100 Hydraulic Cylinder as per Dwg. 4M-12A-23-29242. Specification:	NO	2.000	2.00	17.01.15

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For **BHARAT HEAVY ELECTRICALS LIMITED**

MANAGER / PURCHASE  
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**CAPITAL PURCHASE**  
**COMMERCIAL TERMS AND CONDITIONS**

**1.0 QUOTATIONS**

The Bidders shall submit the offer in **TWO INNER ENVELOPES** as indicated below which shall be sealed in one outer envelope.

**Envelope I** This sealed envelope should contain all the copies of technical bid together with un-priced commercial bid & annexure III. This envelope should be clearly marked **'Part I - Technical and commercial bid'**,

Indicating Enquiry No., Due Date and Address & Reference of the Bidder.

**Envelope II** This sealed envelope should contain **price as per Annexure-IV format**. This envelope should be clearly marked **"Part II - Price bid"**, indicating **Enquiry No., Due Date and Address & Reference of the Bidder**.

Both the envelopes (Part I & II) shall be put in one cover (**Envelope III**), duly sealed, superscribing as Part I and Part II of Enquiry No., due date of opening and the address and reference of the Bidder

The above offer should reach this office on or before the due date by 14.00 hours (IST). Late offers will not be considered.

Tender should not be addressed to any individual's name but only by designation to

**SENIOR MANAGER /PURCHASE/ CP & SP/ MM / MFG**  
**BHARAT HEAVY ELECTRICALS LIMITED**  
**HIGH PRESSURE BOILER PLANT**  
**TIRUCHIRAPALLI - 620 014**  
**TAMIL NADU**

Tenders should be free from **CORRECTION AND ERASURES**, Corrections if any, must be attested. All Amounts shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail.

Offers should be in **ENGLISH** and accompanied by detailed technical literature, catalogue and detailed dimensional drawings in **ENGLISH** or otherwise, the offers will not be considered.

**2.0 OPENING OF TENDERS**

The Part I - Technical & commercial bid alone would be opened on the Tender opening date.

The Part II - Price bid of technically suitable Bidders alone would be opened. The Technically Suitable Bidders would be informed about the tender opening date through e-mail.

Clarifications if any required by BHEL for Technical evaluation **would be** sought from Bidders before opening of Part II - price bid

**For any queries clarifications the bidders may contact us through our FAX NO. +91 431 2520719 or through e-mail <mmcpmfg1@bheltry.co.in >&< chells@bheltry.co.in>**

**Annexure For Techno Commercial Bid**

Check List - to be filled and submitted along with Technical Bid

BHEL Commercial Terms and Conditions for Indigenous Supplies	Vendor's Confirmation / Comments
Technical confirmation to BHEL's Specification as called for in BHEL Format shall be furnished. If needed additional sheets shall be used.	
Prices shall be <b>quoted item wise</b> only as per the model format enclosed	
Prices shall be quoted on " <b>FIRM PRICE</b> " basis only The prices should be only on <b>F.O.R / Despatching station</b> basis with <b>Packing &amp; Forwarding</b> charges if any. <b>Applicable % of ED &amp; Sales Tax, Freight &amp; Insurance, Installation &amp; Commissioning Charges should be clearly Indicated</b>	
<b>Validity of offer</b> shall be for a minimum period of 120 days from the date of Tender opening	
Delivery period from the date of Letter of Intent / Purchase order shall be clearly mentioned in the offer	
<b>Liquidated damages @ '0.5%</b> per week subject to a maximum of 10% of the order value shall be applicable for delay in deliveries <b>For Details Refer Annexure- v</b>	
<b>Following Risk Purchase clause</b> shall be applicable The purchaser at his option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated or if the same were not available, the best and the nearest available substitute therefore The supplier shall be liable for any loss which the Purchaser may sustain by reason of such risk purchases	
<b>Payment term for supply portion:</b> Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials <b>For details Refer Annexure- v</b>	
Erection / commissioning: (if applicable only) Erection / commissioning charges if any has been mentioned in the offer or else confirmation that Erection /commissioning shall be done at free of cost is available in the offer,	
The equipment shall be guaranteed for a period of 12 months from the date of commissioning	
Final inspection and acceptance of equipment will be after installation at BHEL, Trichy	
The vendor shall provide necessary drawings, Test Certificates and Operating Maintenance Manuals etc., as called for in the Technical Specification, in the required number of copies at no extra cost	
Any warranty replacement during warranty period shall be supplied free of charge on FOR BHEL, Trichy basis.	
Offers should be submitted only in <b>sealed cover super-scribing clearly the Enquiry reference and due date.</b>	
% of Excise Duty with cess	
% of TAX (CST/VAT)-(INGST with FORM-17 or CST with C-FORM)	
Packing & Forwarding Charges ( if any in % only)	
Percentage of Freight& transit insurance charges, if any Freight charges from Dispatching station to BHEL, Tiruchirappalli • Supplier should quote for F.O.R-BHEL Trichy Stores.	
As per Commercial terms and conditions, acceptance for participation in Reverse auction (RA).Yes/No to be indicated	
Name of the person for participating reverse auction	
Land Line Number	
Fax Number	
Mobile Number	
E-mail ID	

## NOTE:-

- It is confirmed that all the terms and conditions stipulated in the Enquiry have been fully understood by us and all clarifications & details have been obtained.
- Your offer should be indicating applicable if any P&F Charges, % of ED, Sales Tax -CST or VAT, Service Tax), Freight, Insurance and Installation and Commissioning Charges etc., as per our Price Format
- Your specific acceptance to our Payment terms, LD & Risk Purchase Clause are essential for consideration of your offer. Other wise your offer is liable for rejection.
- No row shall be left blank. Please indicate NA, in case the item is "not applicable"



<b>Payment Term (Indigenous)</b>	
<b>If materials are receivable at Stores/Trichy <u>without</u> PBG</b>	Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials.
<b>If materials are receivable at Stores/Trichy <u>with</u> PBG</b>	Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials and against 10% PBG valid for the warranty period.
Any deviation in the above payment term will attract loading as mentioned below. “Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.	

Payment through Bank is not preferred. In case of Payment through Bank is opted by Supplier, BHEL prefers documents submission through bank with copy of LR and door delivery of Goods to Site/Stores with Consignee copy attached. In this case Loading will be 3% on the offered value.

Offers of indigenous Suppliers with payment terms as LC/Advance Payment are liable for rejection.

#### **Liquidated Damages / Penalty -**

Liquidated damages shall be 0.5% of the total order value per week or part thereof subject to a maximum of 10% of the total order value.

For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value.

Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value).

#### **Guarantee / Warranty Period – (if applicable)**

Normally No deviation permitted and the deviated offers are liable for rejection.

#### **Ranking-**

BHEL will consider the ranking after the loading is applied as referred above wherever deviations are observed.

#### **Performance Bank Guarantee – (if applicable)**

Normally No deviation permitted and the deviated offers are liable for rejection.

#### **NOTE:-**

1. If the due date of tender opening happens to be a holiday, the tenders will be opened on the next working day.
2. BHEL reserves the right to go for a reverse auction (RA) instead of opening the submitted sealed bid which will be decided after technical evaluation. Information and general terms and conditions covering RA are given in commercial terms and conditions.
3. Corrigendum if any, with respect to this tender will be hosted only in the website <http://www.bhel.com> or <http://tenders.gov.in>. You are requested to visit the website regularly for updates.

**Special Provisions for Micro and Small Enterprises (MSE)**

1. 20% of the tendered quantity is earmarked for MSE suppliers in this tender.
2. Out of the 20% tendered quantity reserved for MSE suppliers, 4% shall be earmarked for procurement from MSE owned by SC/ST entrepreneurs.
3. In case MSE vendor participating in the tender quotes within the price band of L1+15%, they will be allowed to supply the portion of the requirement subject to acceptance of L1 price by MSE vendor. In case of more than one such MSE, the supply shall be shared proportionately.
4. "MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed at Annexure -VII where deemed validity of EM II certificate of five Years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer."

**Certificate by Chartered Accountant on letter head**

This is to Certify that MIS .....  
(hereinafter referred to as 'company') having its registered office at  
..... is registered under MSMED Act 2006, (Entrepreneur  
Memorandum No (Part—II) dtd. ....  
Category: .....,....., ..... (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company  
as per the latest audited financial year as per MSMED Act 2006 is as follows:

For Manufacturing enterprises: Investment in plant and machinery (i,e original cost  
excluding land and building and the items specified by the Ministry of Small Scale Industries vide its  
notification No.S.0,1722(E) dated October 6. 2006:

Rs... ..... Lacs

2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and  
furniture, fittings and other items not directly related to the service rendered Or as may be notified under the  
MSMED Act, 2006.

Rs..... Lacs

(Strike off whichever is not applicable)

The above investment of Rs ..... Lacs is within permissible limit of  
Rs..... Lacs for ..... Micro I Small (Strike off which is not applicable)  
Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/ Small) (Strike off which is not  
applicable) and the date of graduation of such enterprise from its original category is .....  
(dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such  
enterprise from its original category as notified vide S.D. No. 3322(E) dated 01.11.2013  
published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

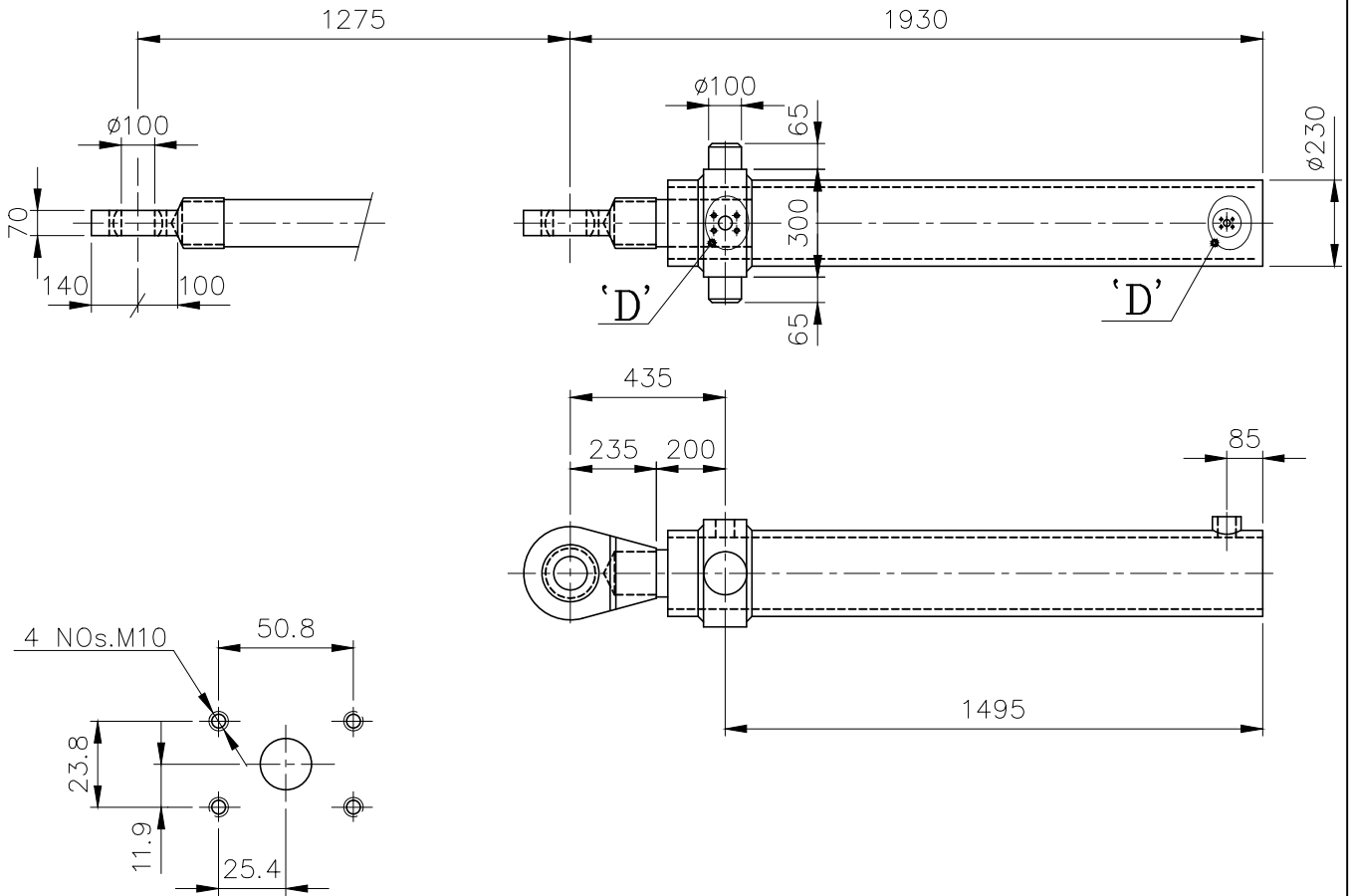
(Signature)

Name -

Membership number -

Seal of Chartered Accountant

ALL DIMENSIONS ARE IN MM



**DETAIL- 'D'**

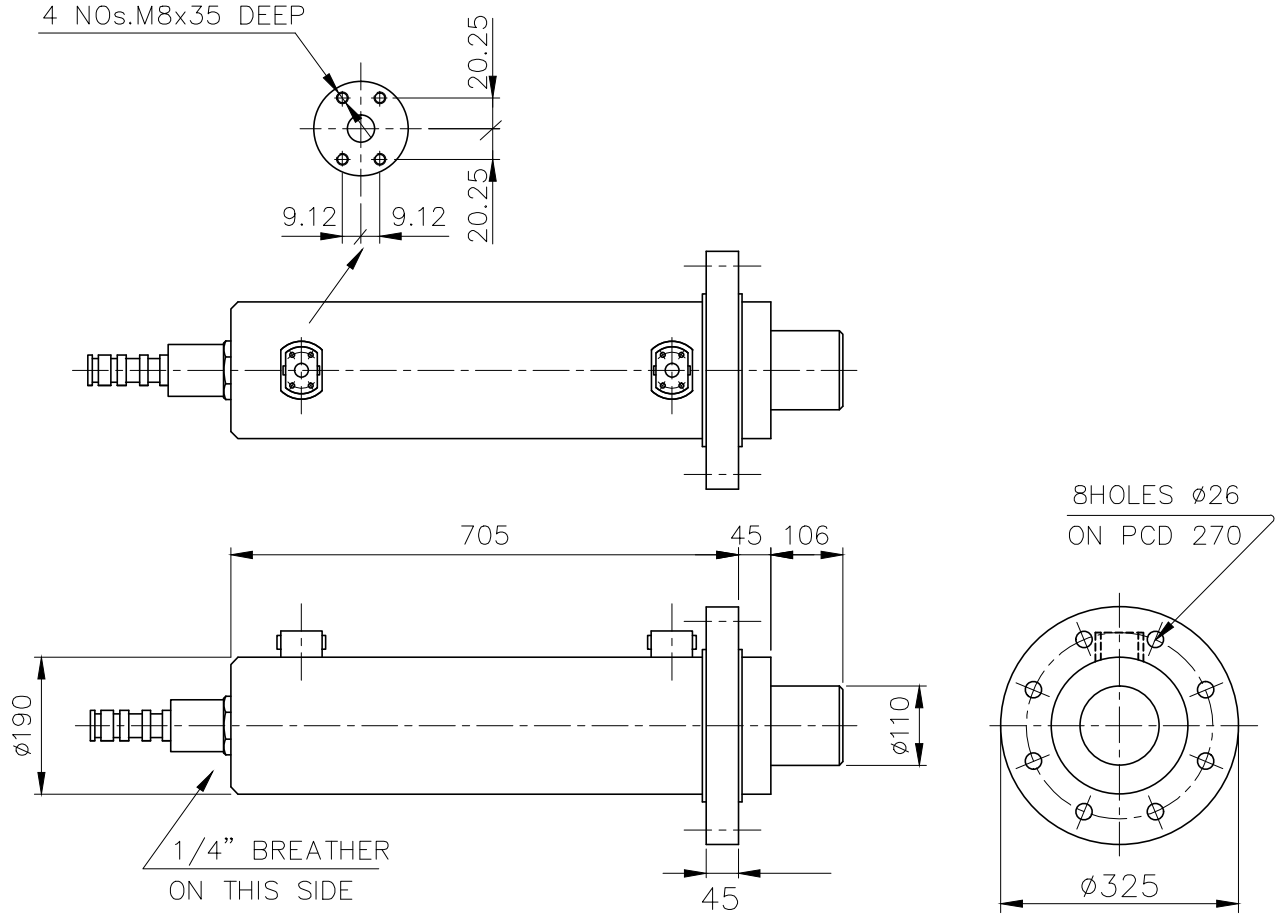
FOR SAE FLANGE  
3/4"-6000 PSI  
CYLINDER TYPE: -ZDH 200-125-1275-B0  
ZD-TRUNION MOUNTING

MAX.OIL PRESSURE :  
BORE : 200  
STROKE : 1275 mm.  
ROD : 125

No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE: COJAFEX BV 75.11.0201/4		ALTERATIONS:	DCN REF	DATE	SIGN.
SCALE	DRN. P.Albert Ross					
1:5	CHD. G.Govinda raj					
	APP. K.Ramanan					
	DATE 15-09-12					
MACHINE: INCREMENTAL PIPE BENDER			TYPE: CNC PB 600			
TITLE: <b>HYDRAULIC CYLINDER</b> (PUSHER CLAMP ROTATION)			DRAWING No:			REV.
			4M12A2329246			
			Sheet No:			No. of Sheets:

PURPOSE WITHOUT THE WRITTEN PERMISSION  
PURPOSE WITHOUT THE WRITTEN PERMISSION  
OF BHARAT HEAVY ELECTRICALS LIMITED

ALL DIMENSIONS ARE IN MM





CYLINDER TYPE: -V32-160-110-450/FD-XX-DW-3-A-2-K

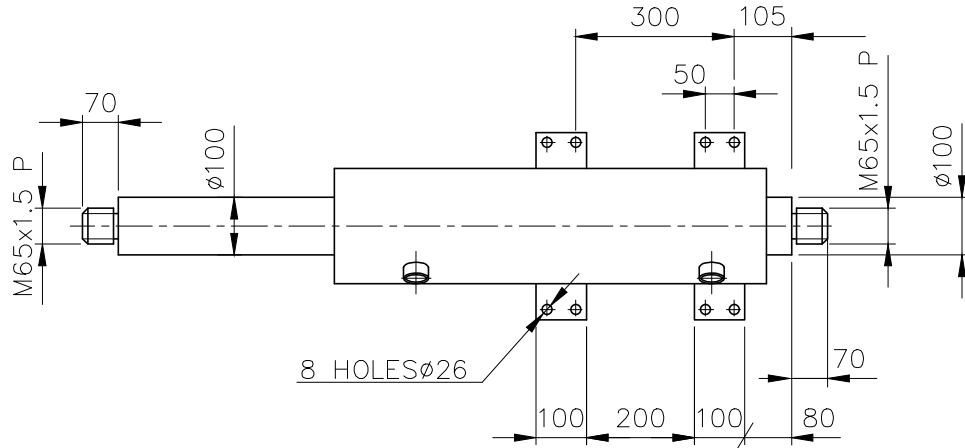
MAX.OIL PRESSURE :320 BAR  
BORE :160.  
ROD :110  
STROKE :450 mm.

FD-FRONT FLANGE MOUNTING  
XX-  
DW-DOUBLE ACTING  
3-LOW FRICTION  
A-20 Mn. V6/St. 52-25 Mu. HARD CHROME PLATE  
2-SPECIAL  
K-NO CUSHIONING

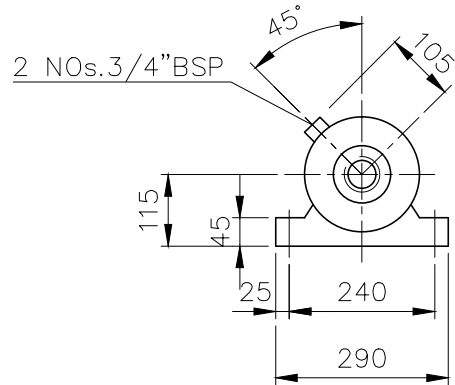
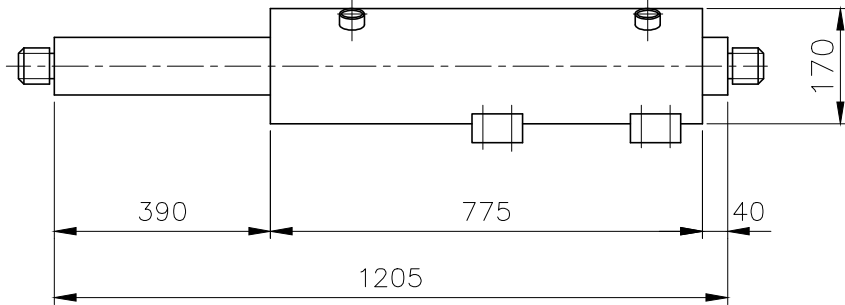
01.BALLUFF BTL5-E10-M0475-B-S32  
02.SPECIAL PISTON ROD

No.of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE: COJAFEX BV 75.09.0205/4		ALTERATIONS:	DCN REF	DATE	SIGN.
SCALE 1:10	DRN. P.Albert Ross					
	CHD. G.Govinda raj					
	APP. K.Ramanan					
	DATE 15-09-12					
	MACHINE: INCREMENTAL PIPE BENDER	TYPE: CNC PB 600				REV.
	TITLE: <b>HYDRAULIC CYLINDER</b> (M/C. UP-DOWN-2)	DRAWING No: <b>4M12A2329245</b>				
		Sheet No: No.of Sheets:				

ALL DIMENSIONS ARE IN MM



A →



VIEW- 'A'

TYPE: -V32-140-100-350/VD-DS-DD-1-A-2-K

MAX.OIL PRESSURE : 320 BAR

BORE :  $\phi 140$ .

ROD :  $\phi 100$

STROKE : 350 mm.

VD-FOOT MOUNTING

DS-THREAD MOUNTING

DD-DOUBLE ACTING WITH DOUBLE PISTON ROD

1-STANDARD

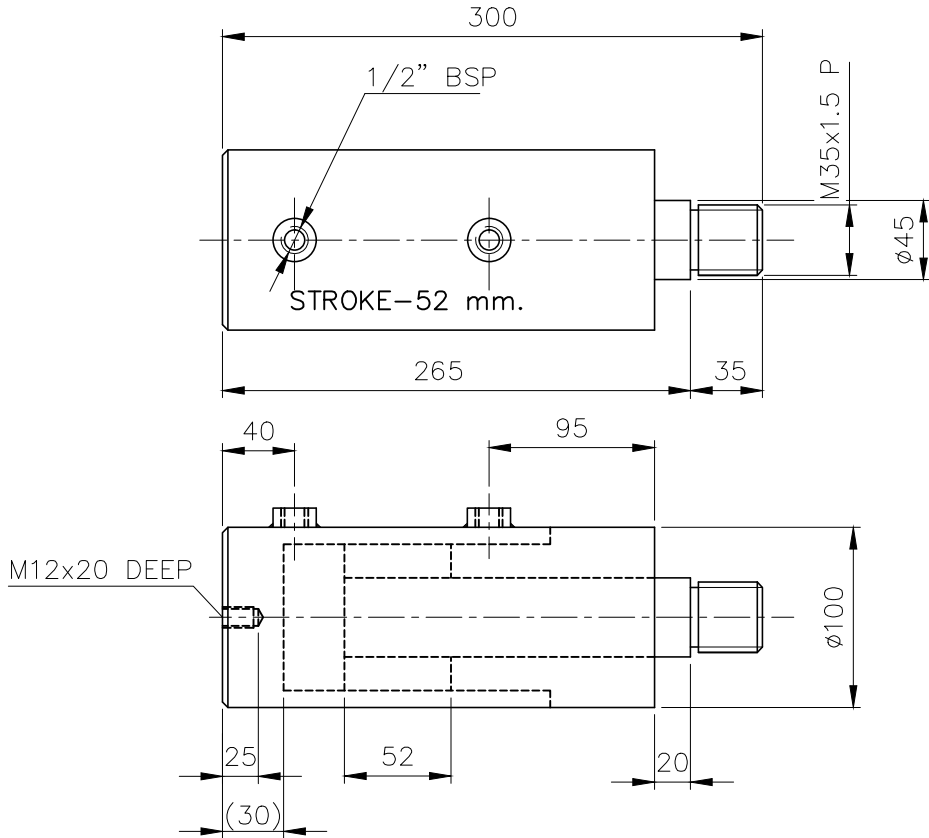
A-20 Mn. V6/St. 52-25 Mu. HARD CHROME STEEL.

2-SPECIAL

K-NO CUSHIONING

No.of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.		ITEM No.
	REFERENCE: COJAFEX BV 75.18.0214/4		ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
SCALE 1: 2.5	DRN. P.Albert Ross						
	CHD. G.Govinda raj						
	APP. K.Ramanan						
	DATE 15-09-12						
	MACHINE: INCREMENTAL PIPE BENDER	TYPE: CNC PB 600					
	TITLE: <b>HYDRAULIC CYLINDER</b> (LIFT ROLL UP-DOWN-1)	DRAWING No:		REV.			
		4M12A2329243					
	Sheet No:			No.of Sheets:			

ALL DIMENSIONS ARE IN MM



TYPE: -V32-80-45-52/AD-DS-DW-1-A-2-K

MAX.OIL PRESSURE : 320 BAR  
 BORE : 80  
 STROKE : 52 mm.  
 ROD : 45

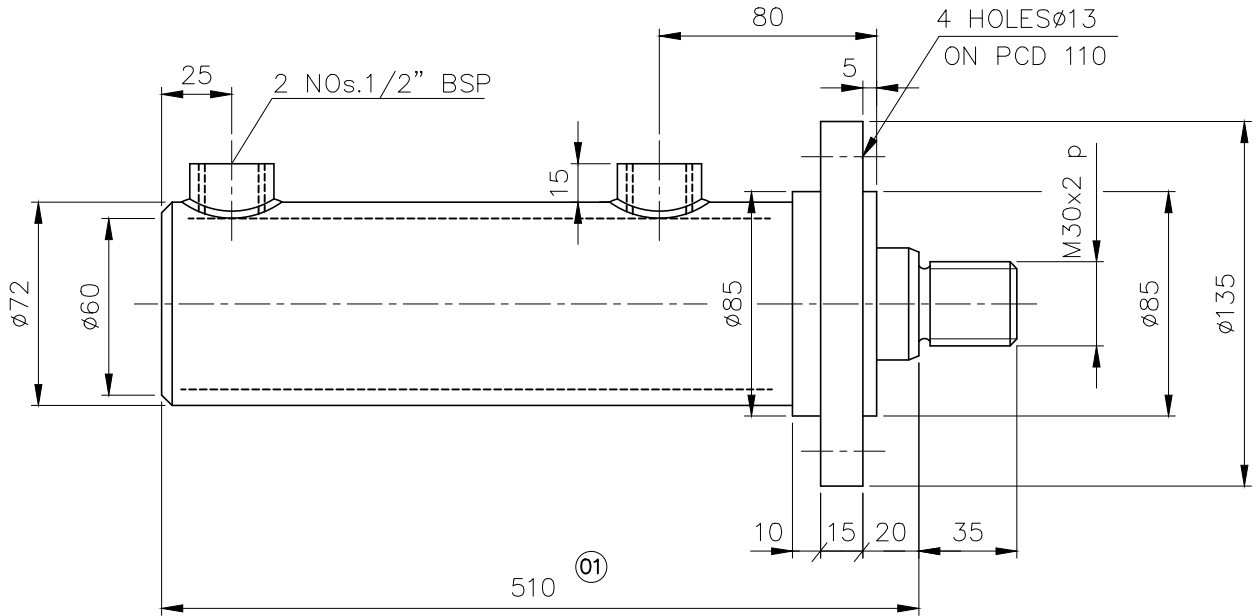
AS-BASIC DESIGN  
 DS-THREAD MOUNTING  
 DW-DOUBLE ACTING  
 1-STANDARD  
 A-20 Mn. V6/St. 52-25 Mu. HARD CHROME STEEL.  
 2-SPECIAL  
 K-NO CUSHIONING

No.of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.		ITEM No.
	REFERENCE: COJAFEX BV 75.05.0202/4		ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
SCALE 1:5	DRN. P.Albert Ross						
	CHD. G.Govinda raj						
	APP. K.Ramanan						
	DATE 15-09-12						
	MACHINE: INCREMENTAL PIPE BENDER	TYPE: CNC PB 600		DRAWING No:		REV.	
	TITLE: <b>HYDRAULIC CYLINDER</b> (LIFT ROLL ROTATION)	4M12A2329242		Sheet No:		No.of Sheets:	



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OF BHARAT HEAVY ELECTRICALS LIMITED

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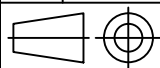

TYPE FDS: 60/40

STROKE : 335 (02)

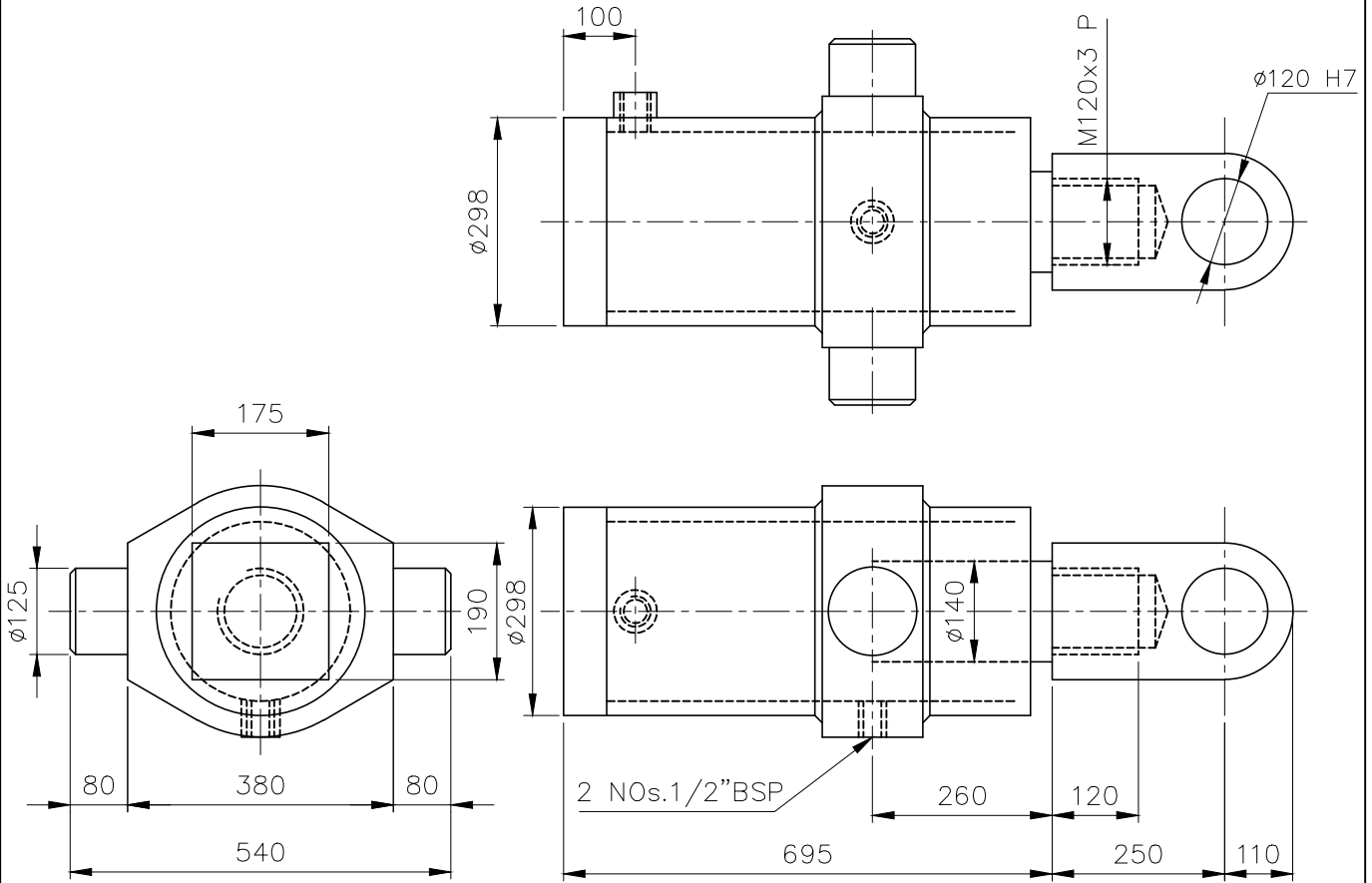
BORE : 60

ROD : 40

FD-FRONT FLANGE MOUNTING

No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.		
	REFERENCE:	ALTERATIONS:		DCN REF	DATE	SIGN.	INDEX	
	COJAFEX BV 75.04.0208/4	DIMN.855 REMOVED			01.08.13	K.R	(01)	
SCALE	DRN.	P.Albert Ross	DIMN.335 WAS 680			31.08.13	K.R	(02)
	CHD.	G.Govinda raj						
	APP.	K.Ramanan						
	DATE	15-09-12						
	MACHINE: INCREMENTAL PIPE BENDER			TYPE: CNC PB 600				
	TITLE:			DRAWING No:			REV.	
	HYDRAULIC CYLINDER (SLIDE ROLL)			4M12A232924002				
			Sheet No:			No. of Sheets:		

ALL DIMENSIONS ARE IN MM



CYLINDER TYPE : ZDH 250-140-190- (VO)

ZD-TURNNION MOUNTING

BORE : 250

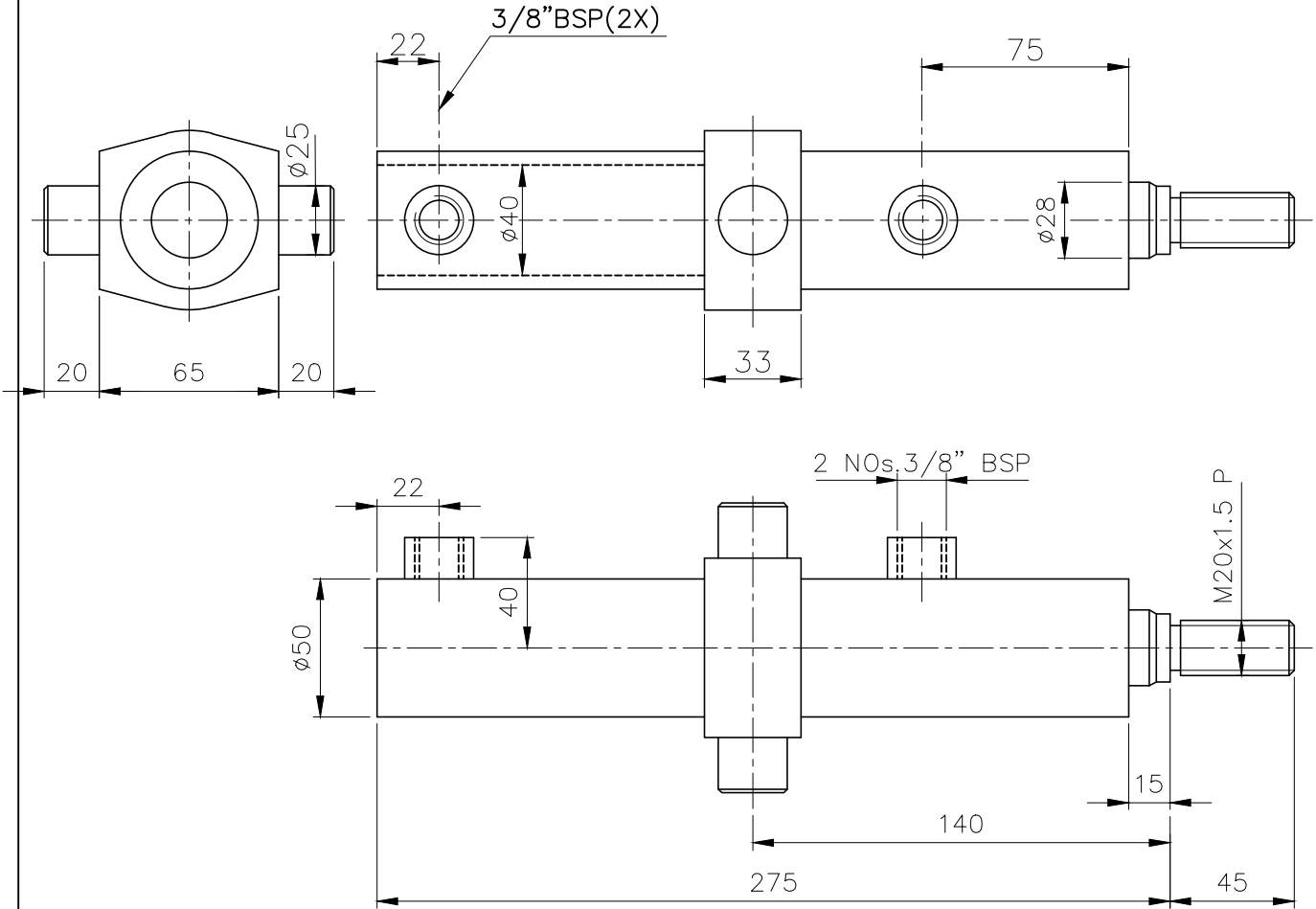
STROKE : 190 mm.

ROD : 140

No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT. IN KGS.	DRAWING No.		ITEM No.
	REFERENCE: COJAFEX BV 75.13.0202/4		ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
SCALE 1:5	DRN.	P. Albert Ross					
	CHD.	G. Govinda raj					
	APP.	K. Ramanan					
	DATE	15-09-12					
	MACHINE: INCREMENTAL PIPE BENDER	TYPE: CNC PB 600				REV.	
	TITLE: <b>HYDRAULIC CYLINDER</b> (PUSHER CLAMP)	DRAWING No:		4M12A2329239			
		Sheet No:		No. of Sheets:			

PURPOSE WITHOUT THE WRITTEN PERMISSION  
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OF BHARAT HEAVY ELECTRICALS LIMITED

ALL DIMENSIONS ARE IN MM



MAX.OIL PR. : 320 BAR

BORE :  $\phi 40$

STROKE : 120 mm.

ROD :  $\phi 28$

TYPE: -V21-40-28-120/ZD-DS-DW-1-A-1-K

ZD-(TRUNNION MOUNTING)DS-(SPHERICAL EYE -SCREW MOUNTING),DW-(DOUBLE ACTING)

1-STANDARD A-20 Mn. V6/St.52-25 Mu.HARD CROME PLATE

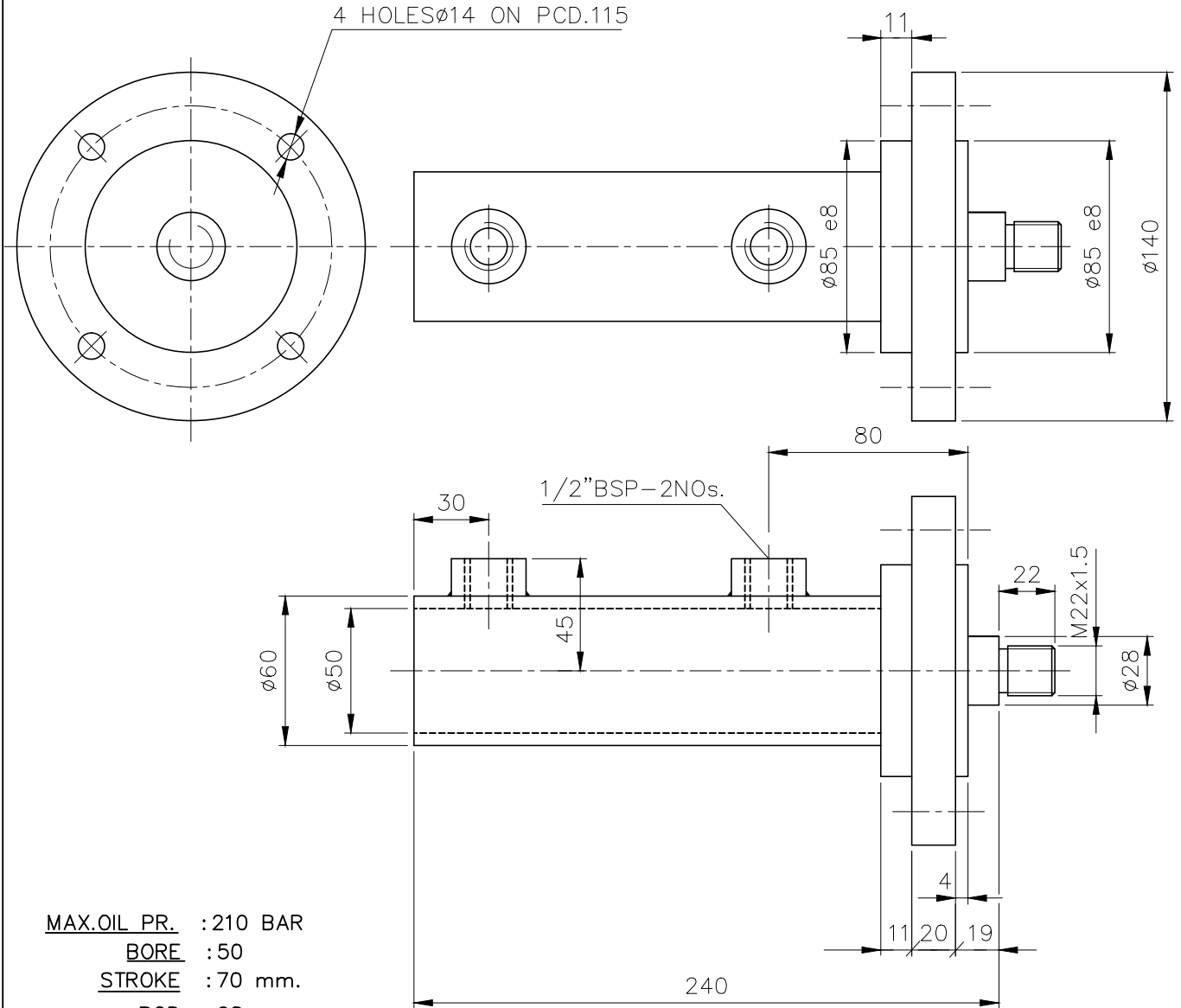
1-STANDARD

K-NO CUSHING

No.of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.		ITEM No.
	REFERENCE: COJAFEX BV 75.02.0207/4		ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
SCALE 1:2.5	DRN.	P.Albert Ross					
	CHD.	G.Govinda raj					
	APP.	K.Ramanan					
	DATE	15-09-12					
	MACHINE: INCREMENTAL PIPE BENDER			TYPE: CNC PB 600			
	TITLE: HYDRAULIC CYLINDER (PULL ROD ROTATION.)			DRAWING No:			REV.
				4M12A2329238			
			Sheet No:			No.of Sheets:	

PURPOSE WITHOUT THE WRITTEN PERMISSION  
PURPOSE WITHOUT THE WRITTEN PERMISSION  
OF BHARAT HEAVY ELECTRICALS LIMITED

ALL DIMENSIONS ARE IN MM



MAX.OIL PR. : 210 BAR

BORE : 50

STROKE : 70 mm.

ROD : 28

TYPE: -V21-50-28-70/FD-DS-DW-1-A-1-K/SPECIAL FLANGE

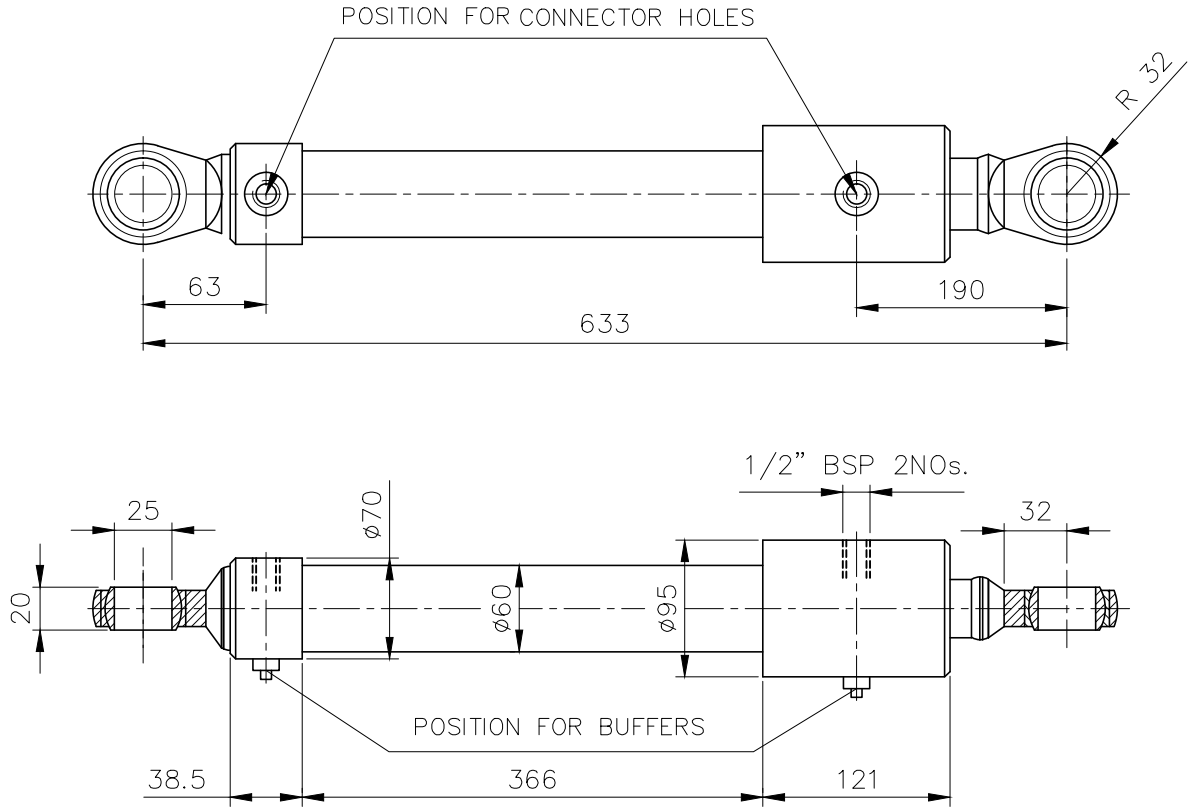
FD-(FRONT FLANGE MOUNTING); DS-(THREAD MOUNTING); DW-(DOUBLE ACTING)

1-STANDED

A-20 Mn. V6/St.52-25 Mu. HARD CHROME PLATE; 1-STANDARD;K-NO CUSHING

No.of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.		ITEM No.
	REFERENCE: COJAFEX BV 75.03.0202/4		ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
SCALE 1:5	DRN.	P.Albert Ross					
	CHD.	G.Govinda raj					
	APP.	K.Ramanan					
	DATE	15-09-12					
	MACHINE: INCREMENTAL PIPE BENDER	TYPE: CNC PB 600		DRAWING No:		REV.	
	TITLE: <b>HYDRAULIC CYLINDER</b> (POSITION M/C.)	4M12A2329237		Sheet No:		No.of Sheets:	

ALL DIMENSIONS ARE IN MM



GL-(SPHERICAL EYE MOUNTING), DW-(DOUBLE ACTING)

1-STANDARD, A-20 Mn. V6/St.52-25 Mu. HARD CHROME PLATE)

1-STANDARD

L-CUSHING ON BOTH SIDES

TYPE: -V21-50-35-350/GL-GL-DW-1-A-1-L/SPECIAL EXECUTION

MAX.OIL PR. : 210 BAR

BORE : 50

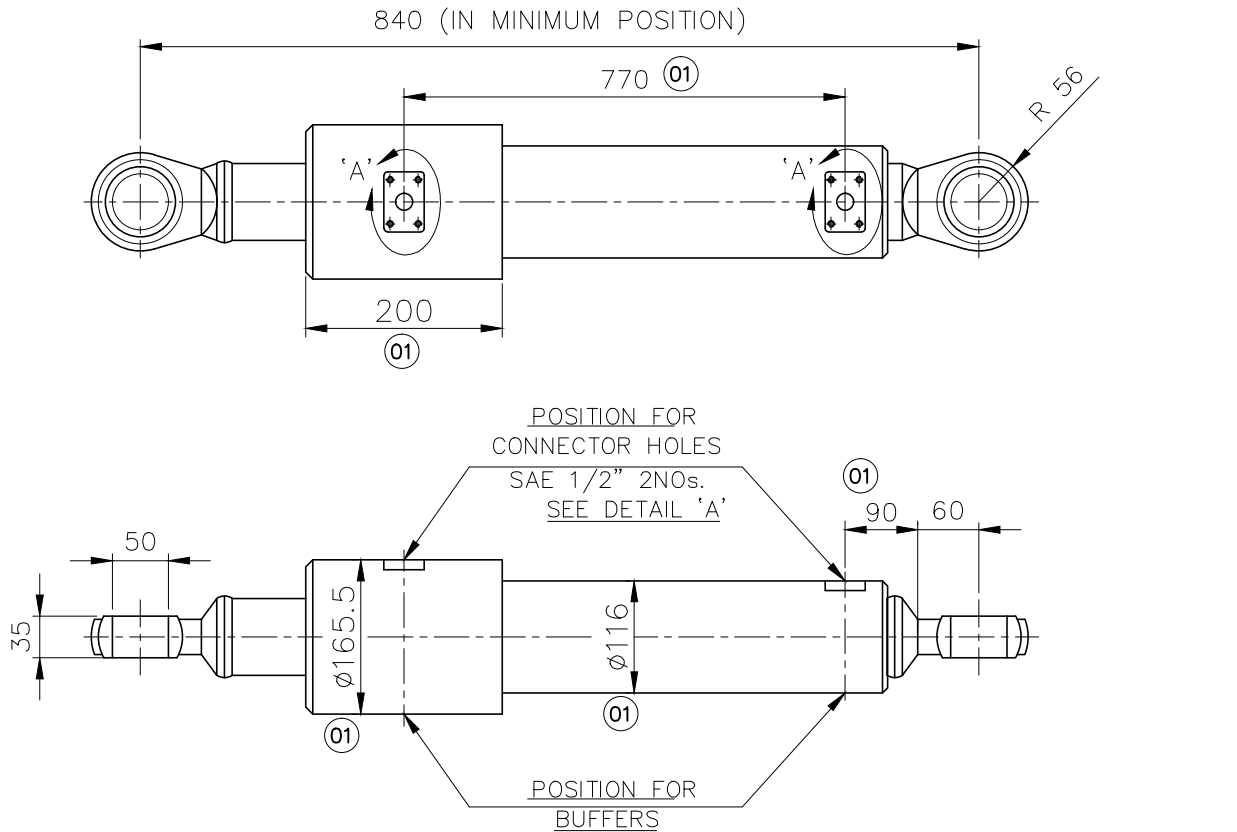
STROKE : 350 mm.

ROD : 35

No. of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE: COJAFEX BV 75.03.0204/4		ALTERATIONS:	DCN REF	DATE	SIGN.
SCALE 1:5	DRN.	P.Albert Ross				
	CHD.	G.Govinda raj				
	APP.	K.Ramanan				
	DATE	15-09-12				
MACHINE: INCREMENTAL PIPE BENDER			TYPE: CNC PB 600			
TITLE: <b>HYDRAULIC CYLINDER</b> (BOOSTER BEND ARM CLAMP LID)			DRAWING No:			REV.
			4M12A2329236			
			Sheet No:			No. of Sheets:

PURPOSE WITHOUT THE WRITTEN PERMISSION OF BHARAT HEAVY ELECTRICALS LIMITED

ALL DIMENSIONS ARE IN MM



GL-SPHERICAL EYE WELDED

DW-DOUBLE ACTING

1-STANDARD (20 Mn.V6/St.52-25 Mu.HARD CROME PLATE)

-SPECIAL-CUSHING ON BOTH SIDES.

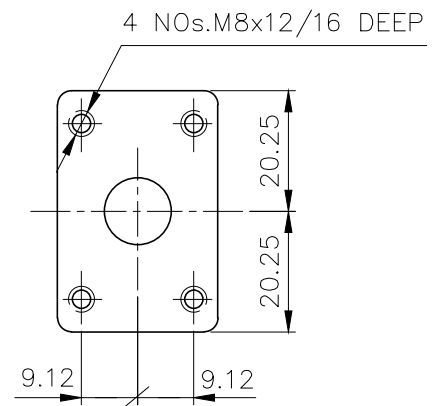
TYPE: -V21-100-70-360/GL-DW-1-A-2-L

MAX.OIL PRESSURE : 210 BAR

BORE :  $\phi 100$  (01)

STROKE : 360 mm.

ROD : 70



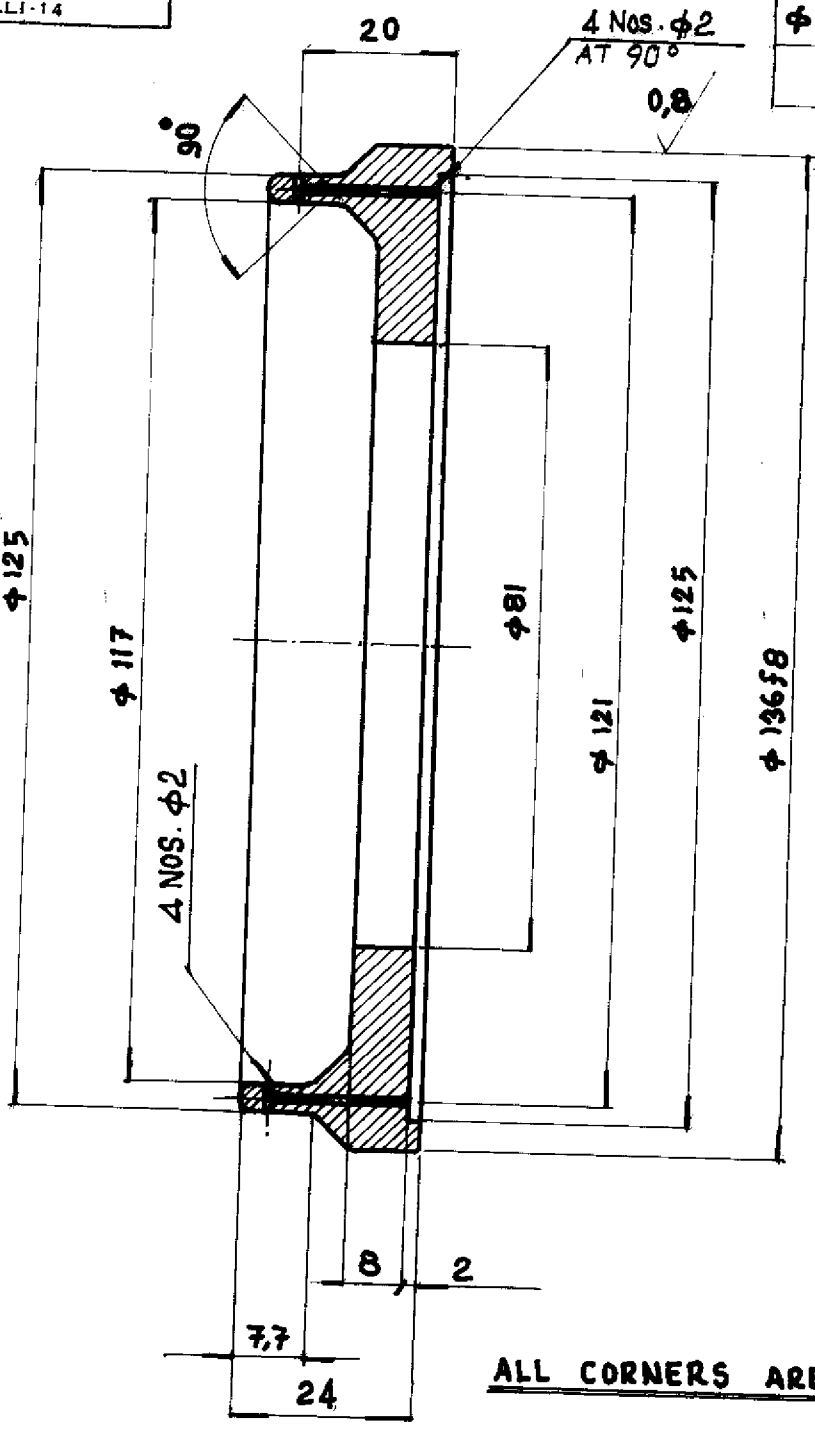
DETAIL-'A'

No.of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.		ITEM No.
	REFERENCE:	COJAFEX BV 75.06.0203/4	ALTERATIONS:	DCN REF	DATE	SIGN.	INDEX
			DIMN. $\phi 100$ WAS $\phi 250$ NEW DIMNS.ADDED		20.06.13	K.R	(01)
SCALE	DRN.	P.Albert Ross					
	CHD.	G.Govindaraj					
	APP.	K.Ramanan					
	DATE	15-09-12					
	MACHINE: INCREMENTAL PIPE BENDER		TYPE: CNC PB 600				
	TITLE:		DRAWING No:				REV.
	HYDRAULIC CYLINDER (BEND ARM CLAMP ROTATION)		4M12A232923401				
		Sheet No:		No.of Sheets:			

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**BHARAT HEAVY ELECTRICALS LTD.,**  
**TIRUCHIRAPALLI-14**

32/	0,8/
φ 136 f 8	-0,043
	-0,106



**ALL CORNERS ARE 1MM RADIUS**

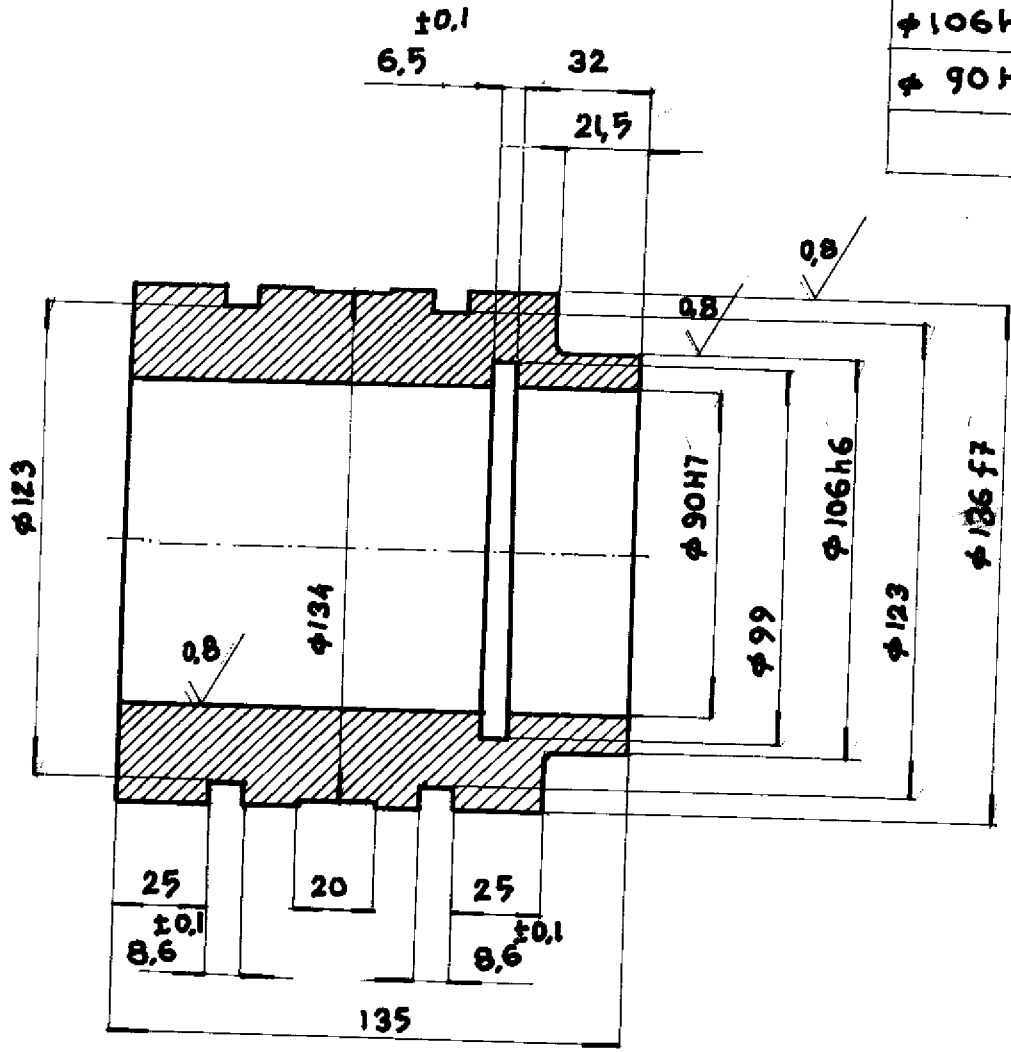
		C 30 IS: 2073					3-M.12d-7780		5	
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt(kg)	GROSS Wt(kg)	DRAWING NO.	ITEM NO.	
REMARKS				TOTAL NET Wt (kg)						
SCALE 1:1	DRAWN	<i>V. Jayaraman</i>		REFERENCE		ALTERATIONS		DATE	SIGNATURE	INDEX
	CHECKED	<i>S. Srinivasan</i>								
	APPROVED	<i>K. Srinivasan</i>								
	STDS. OFFICER									
DATE	25.2.80									
MACHINE		PIPE BENDING.			TYPE:		CH 6		INV. NO.	
TITLE:		<b>RETAINER</b> [BOOSTER CYLINDER]			DRAWING NO.		4.M.12d.19403 <sup>02</sup>			
NO. OF SHEETS		SHEET NO.								



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 TIRUCHIRAPALLI-14

	3,2	0,8
φ136 f7	-0,043	-0,083
φ106 h6	-0,000	-0,022
φ 90 H7	+0,035	+0,000



		C. I GR. 20 IS: 210				3.M.12a.7700 4	
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (kg)	GROSS WT (kg)
REMARKS				TOTAL NET WT (kg)			
SCALE	DRAWN	REFERENCE		ALTERATIONS		DATE	SIGNATURE
1:2,5	<i>V. Sangeromas</i>						
	CHECKED						
	APPROVED						
	STDS. OFFICER						
	DATE	25.2.80					
MACHINE		PIPE BENDING		TYPE:		CH 6	
TITLE:		PISTON		DRAWING NO.		INV. NO.	
[BOOSTER CYL]				4.M.12a.19402			
NO. OF SHEETS				SHEET NO.			



**CAUTION**

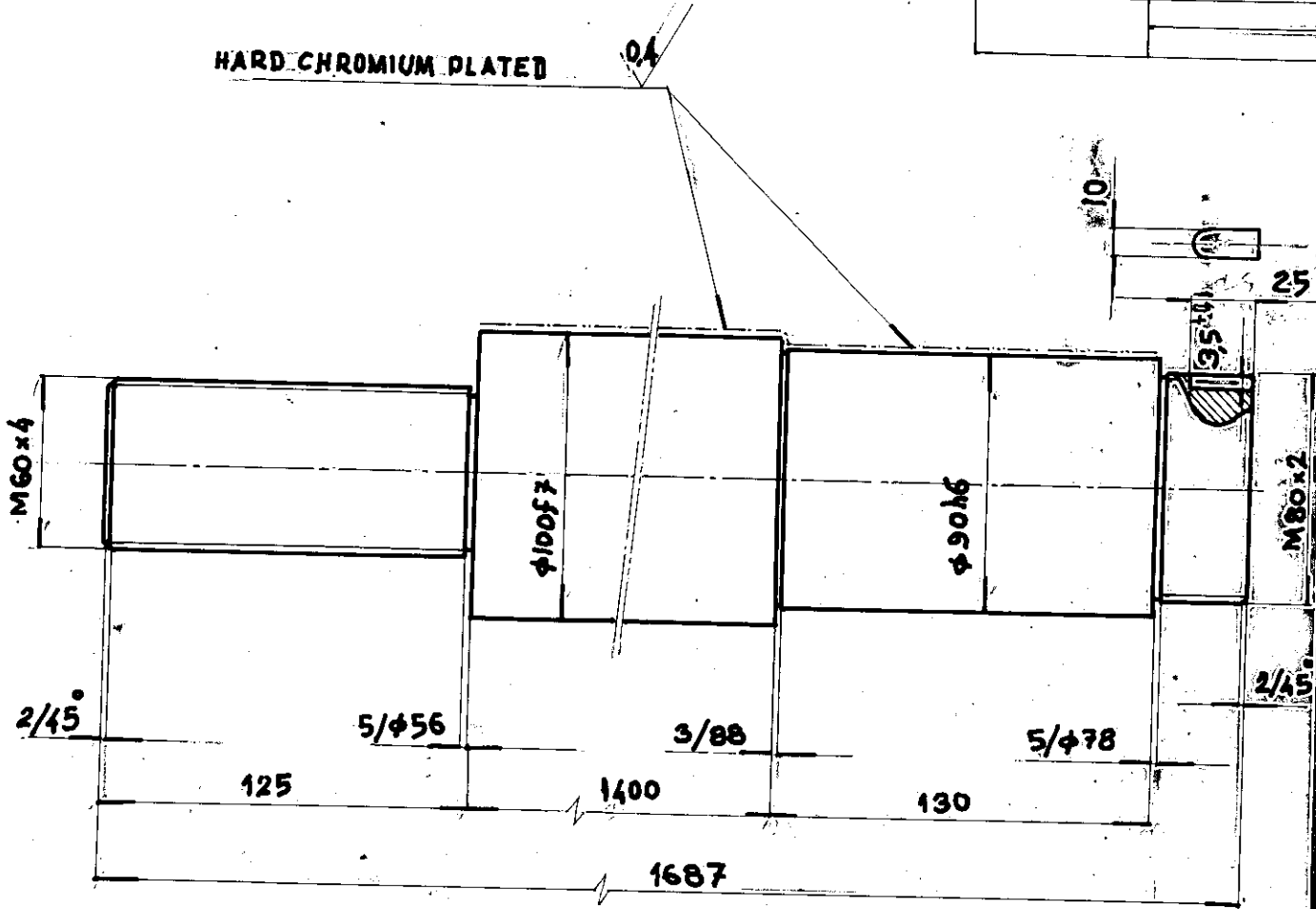
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**BHARAT HEAVY ELECTRICALS LTD.,**  
**TIRUCHIRAPALLI-14**

32 / 0.4

φ100f7	= 0.036
	= 0.071
φ90h6	= 0.000
	= 0.022

**HARD CHROMIUM PLATED**

0.4



		C:55 Mn:75				3M:12α-1780		2	
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT(KG)	GROSS WT(KG)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET WT(KG)					
SCALE	DRAWN	REFERENCE		ALTERATIONS		DATE	SIGNATURE	INDEX	
1:25	<i>V. Jayaraman</i>								
	CHECKED								
	APPROVED								
	STDS. OFFICER								
	DATE	25.2.80							
MACHINE		PIPE BENDING		TYPE		CH6		INV. NO.	
TITLE		PISTON ROD		DRAWING NO.		4.M.12α <sup>02</sup> .19401			
		[BOOSTER CYLINDER]		NO. OF SHEETS		SHEET NO.			

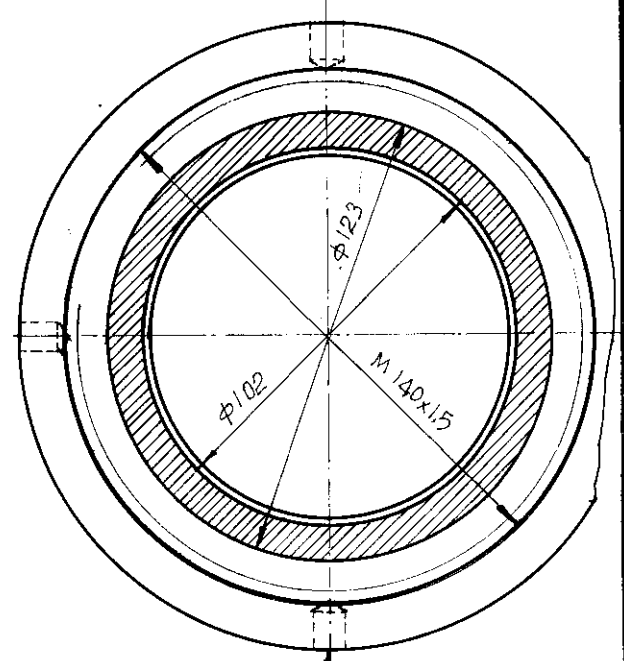
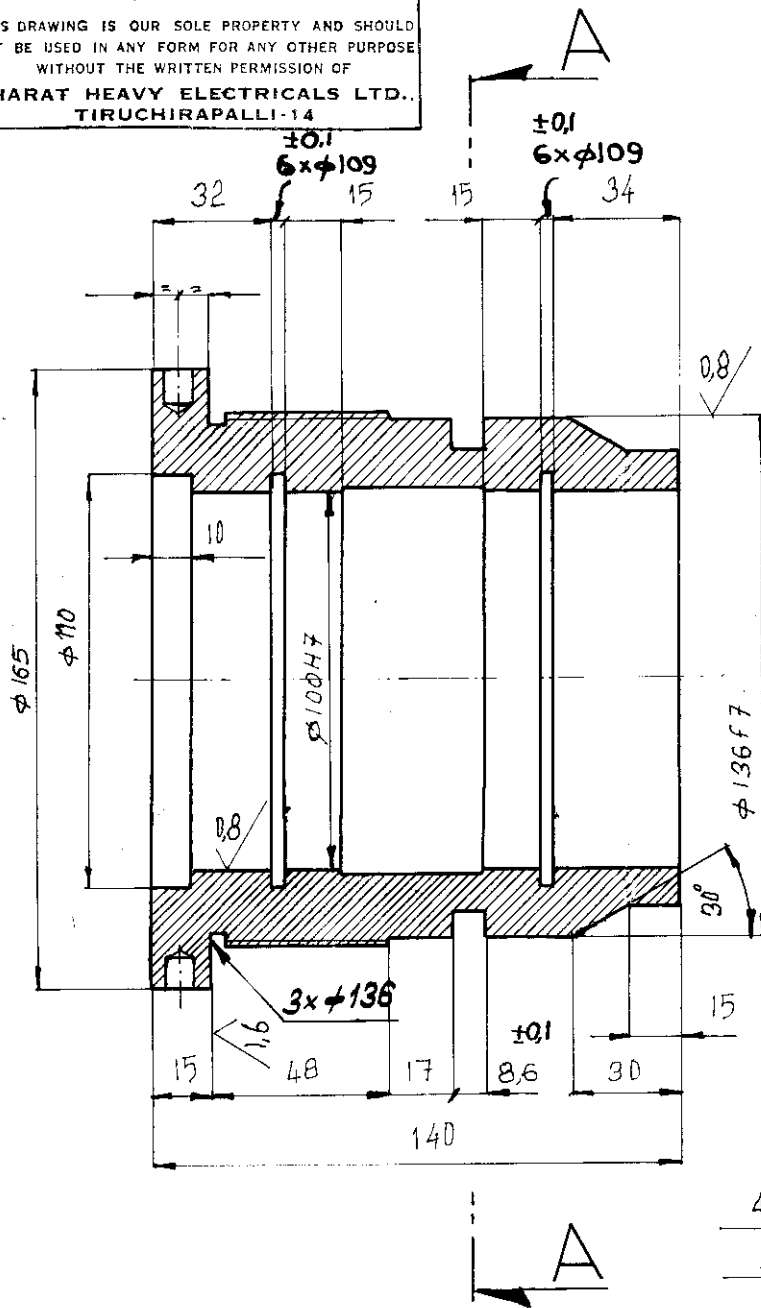
INDEX NO. 39 - 607

INDEX No. 39 - 607

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 TIRUCHIRAPALLI-14

32/16/08

φ136 f7	-0,043
	-0,083
φ100 H7	+0,035
	+0,000



4 NOS. φ 8  
 DEEP ID.

**SECTION.AA**

		CL GR-20 IS: 210		75		3-M-12a-7691 3			
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt(kg)	GROSS Wt(kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET Wt (kg)					
SCALE 1:2	DRAWN	<i>V. Jayaraman</i>		REFERENCE	ALTERATIONS		DATE	SIGNATURE	INDEX
	CHECKED	<i>S. J. ...</i>							
	APPROVED	<i>M. ...</i>							
	SYDS. OFFICER	<i>M. ...</i>							
DATE		26.11.79		TYPE: CH 6		INV. NO.			
MACHINE PIPE BENDING		TITLE: <b>STUFFING BLOCK</b> [BOOSTER CYL. ASSEMBLY]		DRAWING NO. <b>4.M.12a.19178</b> <sup>02</sup>					
NO. OF SHEETS		SHEET NO.							

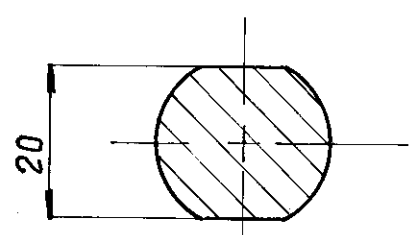


INDEX No. 39 - 607

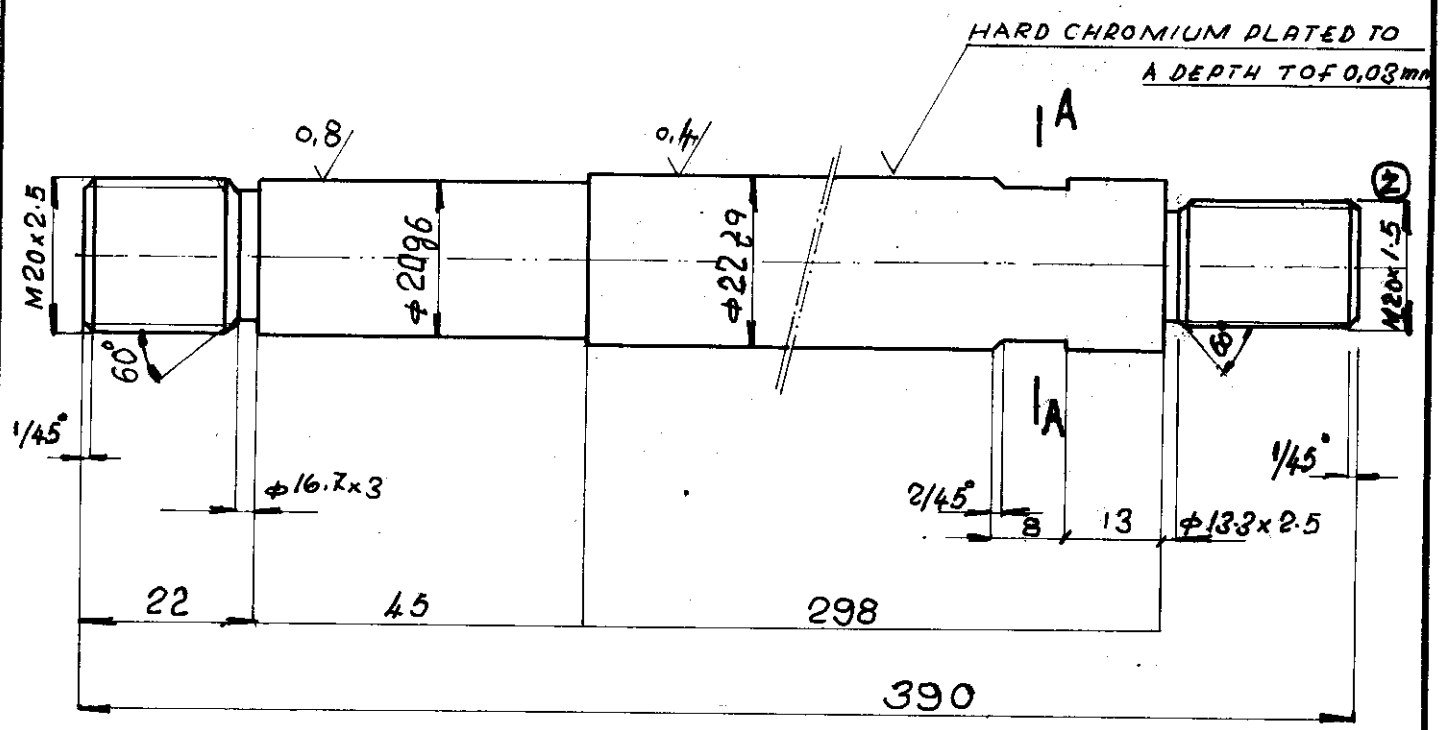
**CAUTION**  
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 TIRUCHIRAPALLI-14

3.2 / 0.8 / 0.4

φ20g6	-0,007
	-0,020
φ22g9	-0,020
	-0,072



SEC- A A



HARDNESS AT PLATED SURFACE 20HRC

FOR ORIGINAL DESIGN REFER DRG. NO. 4-M.12a-2386.

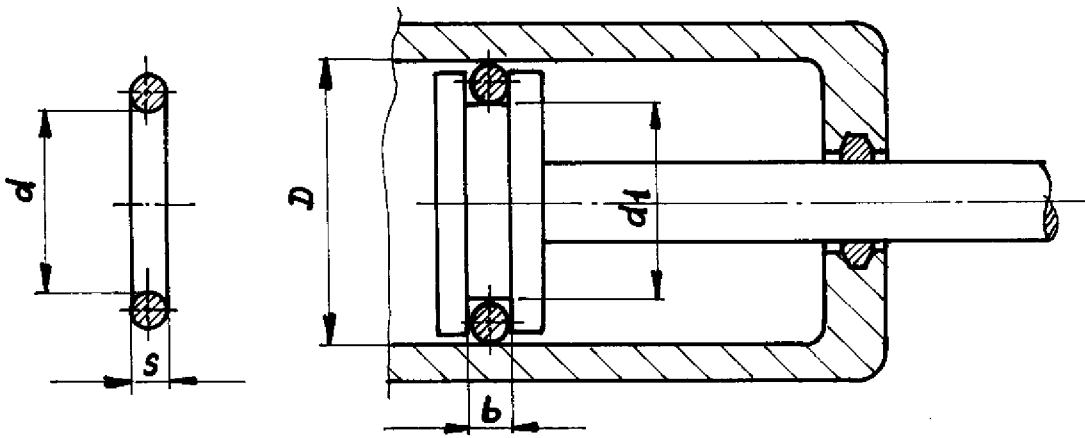
1			BM-C45	45 C8 IS:7283		1.16		2-M-12a-0366	2
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt(kg)	GROSS Wt(kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET Wt (kg) CC 00 EC 02					
SCALE	DRAWN	C. Lakshmanan		REFERENCE	ALTERATIONS		DATE	SIGNATURE	INDEX
	CHECKED				M20x1.5 WAS M16x1.5		29.11.77		
	APPROVED	M. Suresh Kumar							
	STDS. OFFICER								
	DATE	17.12.77							
MACHINE MIN-GORI PIPE BENDING				TYPE: CH-6-127F		INV. NO.			
TITLE: <b>PISTON ROD</b>				DRAWING NO. <b>4.M.12a.02 17385</b>					
				NO. OF SHEETS		SHEET NO.			

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*[Handwritten signature]*

39-607 A

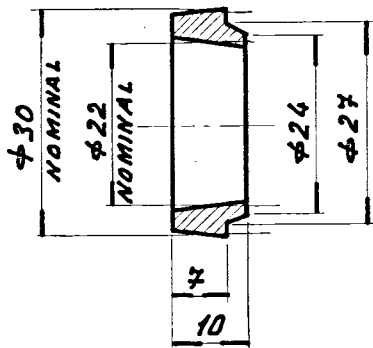


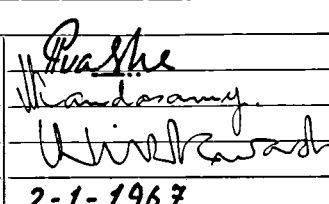

ITEM NO.	DIMENSIONS WHEN FREE				DIMENSIONS WHEN FITTED IN POSITION			
	$d$		$s$		$D$ HB/fB	$d_1$	$b$	
	NOMINAL DIMENSIONS	DEVIATION PERMITTED	NOMINAL DIMENSIONS	DEVIATION PERMITTED			NOMINAL DIMENSIONS	DEVIATION PERMITTED
9	37,5	$\pm 0,3$	5,6	$\pm 0,12$	48	38,4	6,5	$\pm 0,1$
10	21,3	$\pm 0,2$	3,4	$\pm 0,12$	28	22	4,6	$\pm 0,1$
11	19,3	$\pm 0,2$	3,4	$\pm 0,12$	26	20	4,0	$\pm 0,1$

SHORE HARDNESS A75-80

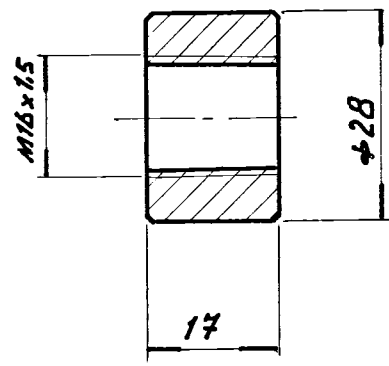
		NEOPRENE RUBBER				2-M-12a-0366		9 10 11	
No. of pcs.	DESCRIPTION	MATERIAL	STD/BPS	Net wt. (kg)	Gross wt. (kg)	DRAWING No.		Item No.	
REFERENCE:			ALTERATIONS			DATE	SIGN.	Index	
SCALE	DRAWN / TO	<i>[Signature]</i>							
	CHECKED								
	APPROVED								
	DATE	30-5-66 / 21-12-91							
MACHINE: MINIGORI PIPE BENDING		TYPE: CH6-127F		Total wt. (kg.)					
TITLE		DRAWING No.		REV.					
O RINGS		4-M-12a-5345		02					
No. of Sheets :		Sheet No.							





1			HARD RUBBER					2-M-12a-0366	B	
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.	
REMARKS				TOTAL NET wt (kg)						
SCALE	DRAWN	 P. S. Srinivasan 2-1-1967	REFERENCE	ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX			
1:1	CHECKED									
	APPROVED									
	STDS. OFFICER									
	DATE									
MACHINE: 'MIN GORI' PIPE BENDING M/L				TYPE: CH-6-127F		INV. NO.				
TITLE:				DRAWING NO:						
				4-M-12a- <sup>02</sup> -2399						
				NO. OF SHEETS		SHEET NO:				

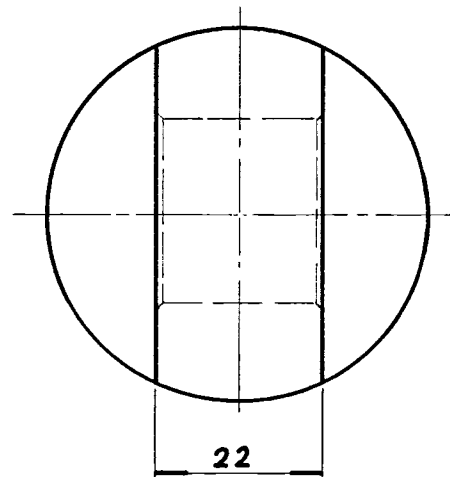
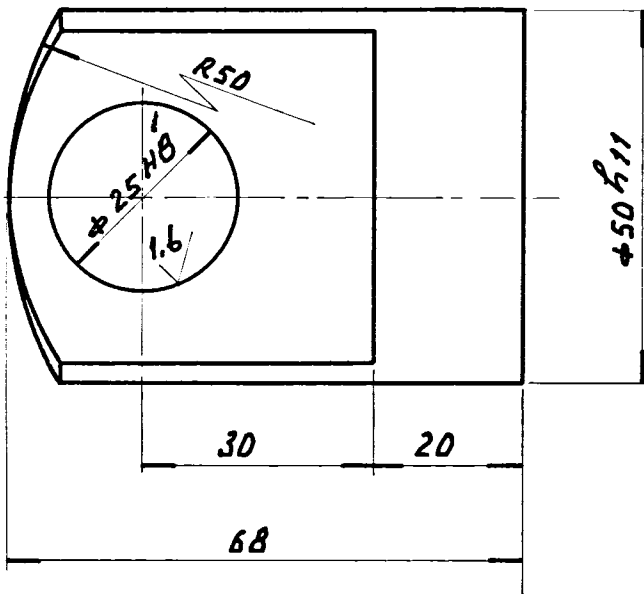
6.3



2			BM-C 30					2-M-12a-0366	7
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt	GROSS Wt	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET wt (kg)					
SCALE	DRAWN	 W. Wickens 1-1-1968	REFERENCE	ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX		
1:1	CHECKED								
	APPROVED								
	STDS. OFFICER								
	DATE								
				MACHINE: 'MINGDEI' PIPE BENDING		TYPE: CH-D-127 F		INV. NO.	
TITLE: BOSS				DRAWING NO: 4-M-12a-2391 <sup>02</sup>					
				NO. OF SHEETS		SHEET NO:			

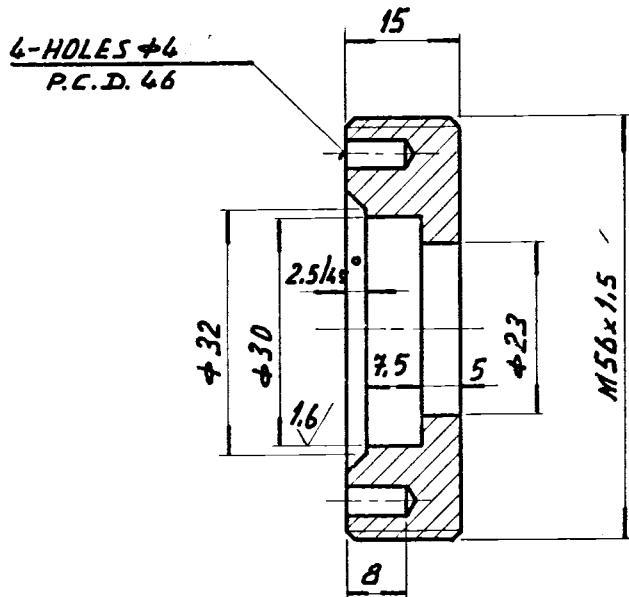
125 / 1.6

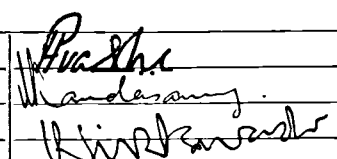
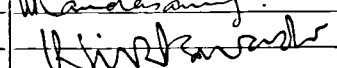

φ25H8	-0.033
	-0.000
φ50h11	-0.160
	-0.000



1			BM-L 30					2-M-12a-0366	6
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET wt (kg)					
SCALE	DRAWN		REFERENCE	ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX		
1:1	CHECKED								
	APPROVED								
	STDS. OFFICER								
	DATE	1-1-1968							
	MACHINE: 'MINGORI' PIPE BENDING			TYPE: CH-6-127 F		INV. NO.			
	TITLE: EYE PIECE			DRAWING NO: 4-M-12a-2390 <sup>02</sup>					
				NO. OF SHEETS		SHEET NO:			

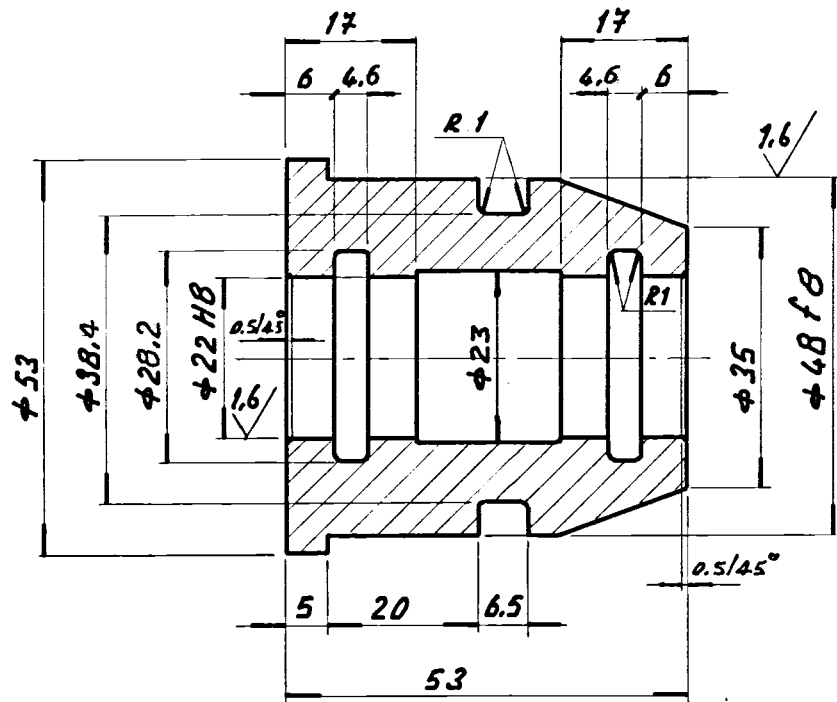
3.2 / 16



1			BM-L 30						2-M-12a-0366	5
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT		DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET wt (kg)						
SCALE	DRAWN	  1-1-1968	REFERENCE	ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX			
1:1	CHECKED									
	APPROVED									
	STDS. OFFICER									
	DATE									
	MACHINE: 'MINGORI' PIPE BENDING			TYPE: CH-6-127 F		INV. NO.				
	TITLE: SEALING NUT			DRAWING NO: 4-M-12a-2389 <sup>02</sup>						
				NO. OF SHEETS		SHEET NO:				

3.2 / 1.6

φ22HB	+0,033
	+0,000
φ48f8	-0,025
	-0,064



1			C.I. Gr.20 1S: 210					2-M-12a-0366	4
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET wt (kg)					
SCALE	DRAWN	REFERENCE	ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX			
1:1	CHECKED								
	APPROVED								
	STDS. OFFICER								
	DATE	1-1-1968							
MACHINE: 'MINGDRI' PIPE BENDING			TYPE: CH-6-12 F		INV. NO.				
TITLE: <b>STUFFING BLOCK</b>			DRAWING NO: <b>4-M-12a-2388</b>		02				
NO. OF SHEETS			SHEET NO:						

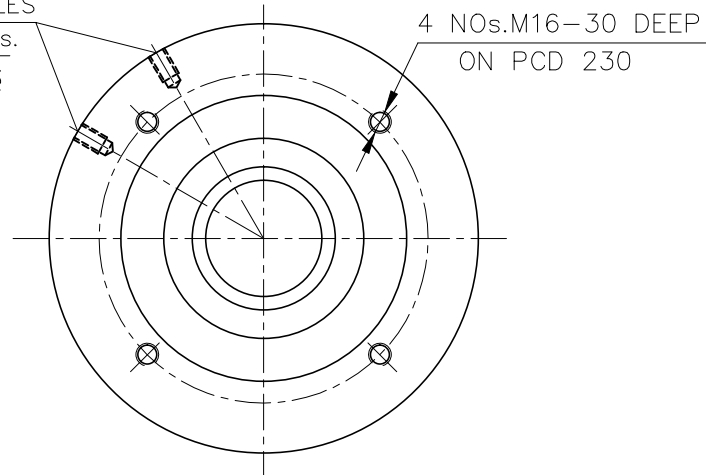




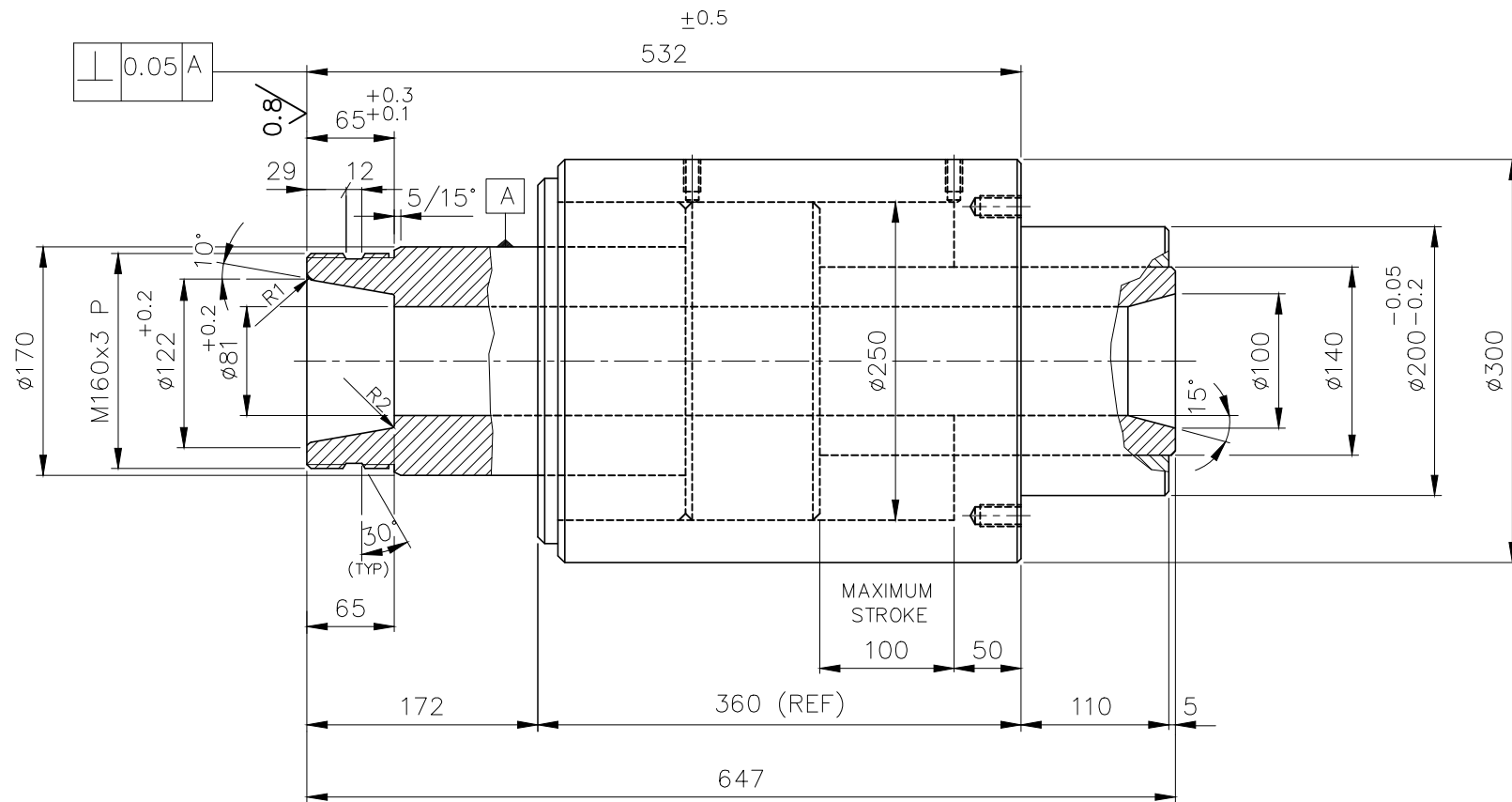
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ALL DIMENSIONS ARE IN MM

POSITION OF CONNECTOR HOLES  
 1/2"BSW-4 NOS.  
 BLOCK 2 PORTS  
 WITH PLUG



4 NOS.M16-30 DEEP ON PCD 230



NOTE: -

ALL THREADED HOLE  $\varnothing 0.2$   
 REMOVE SHARP EDGES

PISTON RODS  $\varnothing 140$  &  $\varnothing 170$  HARD CHROMIUM PLATED

MAX. OIL PR. : 320 BARS

BORE : 250

DD= DOULE ACTING WITH DOUBLE PISTON ROD

STANDARD- (20 Mn. V6/St 52-25 Mu.HARD CROME PLATE)

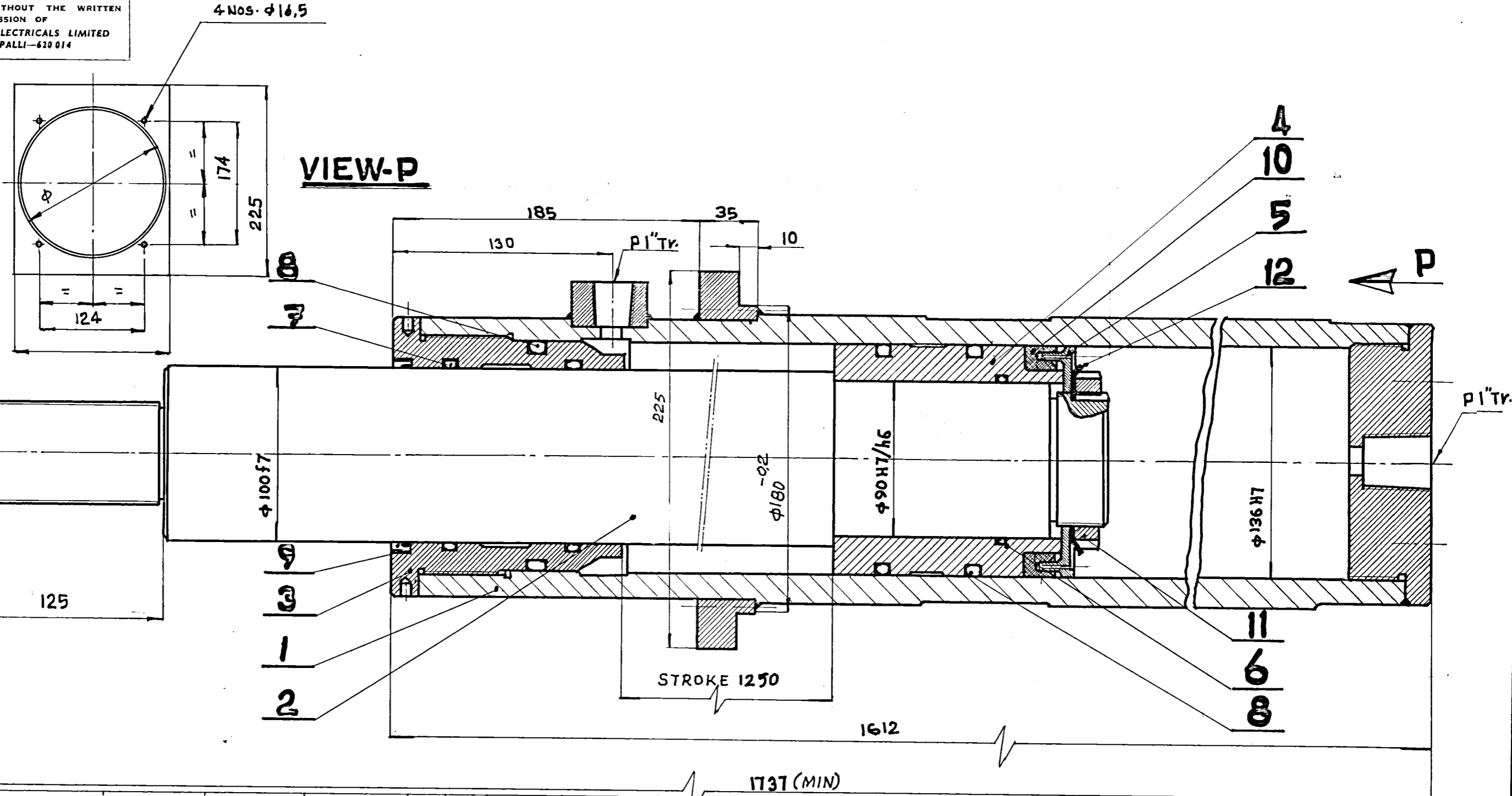
-SPECIAL-NO CASHINING.

HYDR. CYLINDER TYPE V32-250-170/140-100/DD-1-A-2-K SPECIAL EXECUTION.

No.of Pieces	DESCRIPTION	MATERIAL	STANDARD	NET.WT.IN KGS.	DRAWING No.	ITEM No.
	REFERENCE: COJAFEX BV 75.19.0203/3		ALTERATIONS:	DCN REF	DATE	SIGN.
SCALE	DRN.TCD	P.Albert ross				
	CHD.	G.Govinda raj				
1:5	APP.	K.Ramanan				
	DATE	15-09-12				
MACHINE: INCREMENTAL PIPE BENDER			TYPE: CNC PB 600			
TITLE: HYDRAULIC CYLINDER (BEND ARM CLAMP)			DRAWING No:		REV.	
			3M12A2314879			
			Sheet No:		No.of Sheets:	

INDEX No 39-603

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 TIRUCHIRAPALLI-620 014



1	LOCK-WASHER MB 16										12
1	NUT- KM 16 M80 x 2										11
1	LAMINATED-U-CUP 136 x 106 x 19										10
1	SPRING LOADED OIL SEAL φ 110 x φ 100 x 10										9
3	O'RING φ 123 x φ 136										8
2	O'RING φ 100 x φ 109										7
1	O'RING φ 90 x 99										6
1	RETAINER	C 30- IS: 2073		4-M.12a-19403							5
1	PISTON	CI-GR.20- IS: 210		4-M.12a-19402							4
1	STUFFING BLOCK	CI-GR.20- IS: 210		4-M.12a-19178							3
1	PISTON ROD	C 55 Mn 75 IS: 5517		4-M.12a-19401							2
1	CYLINDER	BS:3602 / 62 HFS 27		3-M.12a.7684							1

1737 (MIN)  
 FOR ORIGINAL DESIGN REFER DRG NO. 3.M.12a-7691

NO. OF PIECES		DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (KG.)	GROSS WT (KG.)	DRAWING NO.		ITEM NO.
REMARKS									TOTAL NET WT. (KG.)		
SCALE	DRAWN	V. Jayaraman		REFERENCE	ALTERATIONS			DATE	SIGNATURE	INDEX	
1:25	CHECKED	S. Srinivasan									
1:5	APPROVED	K. Sankaranarayanan									
	STDS. OFFICER	K. Sankaranarayanan									
	DATE	25.2.80									
MACHINE		PIPE BENDING			TYPE:		CH6				
TITLE		BOOSTER CYLINDER ASSY.			DRAWING NO.		3.M.12a.7780 <sup>02</sup>				
[VD-B-136 1250-100F]					No. OF SHEETS.		SHEET No.:				

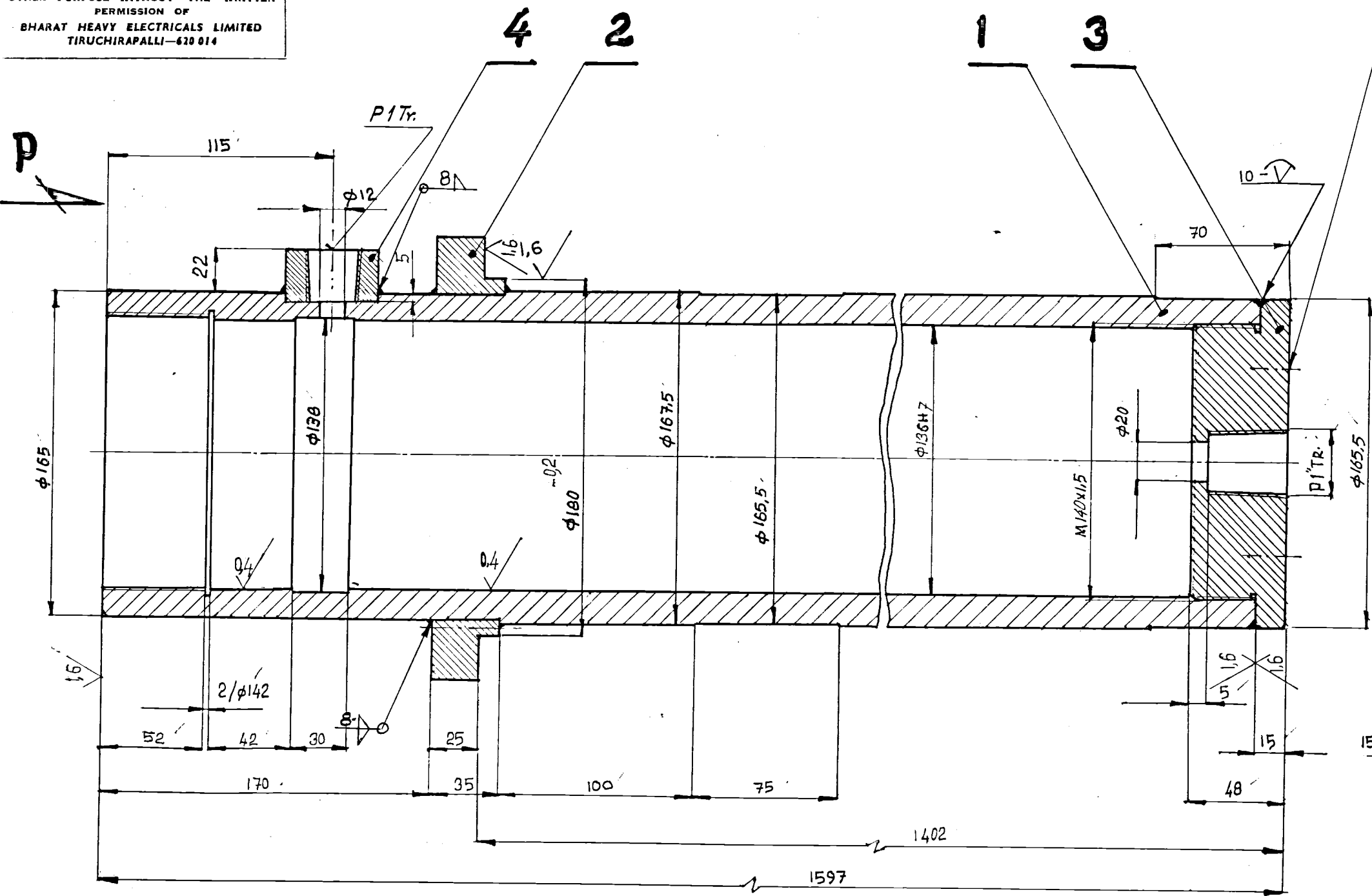
O.M.12a-0205 42



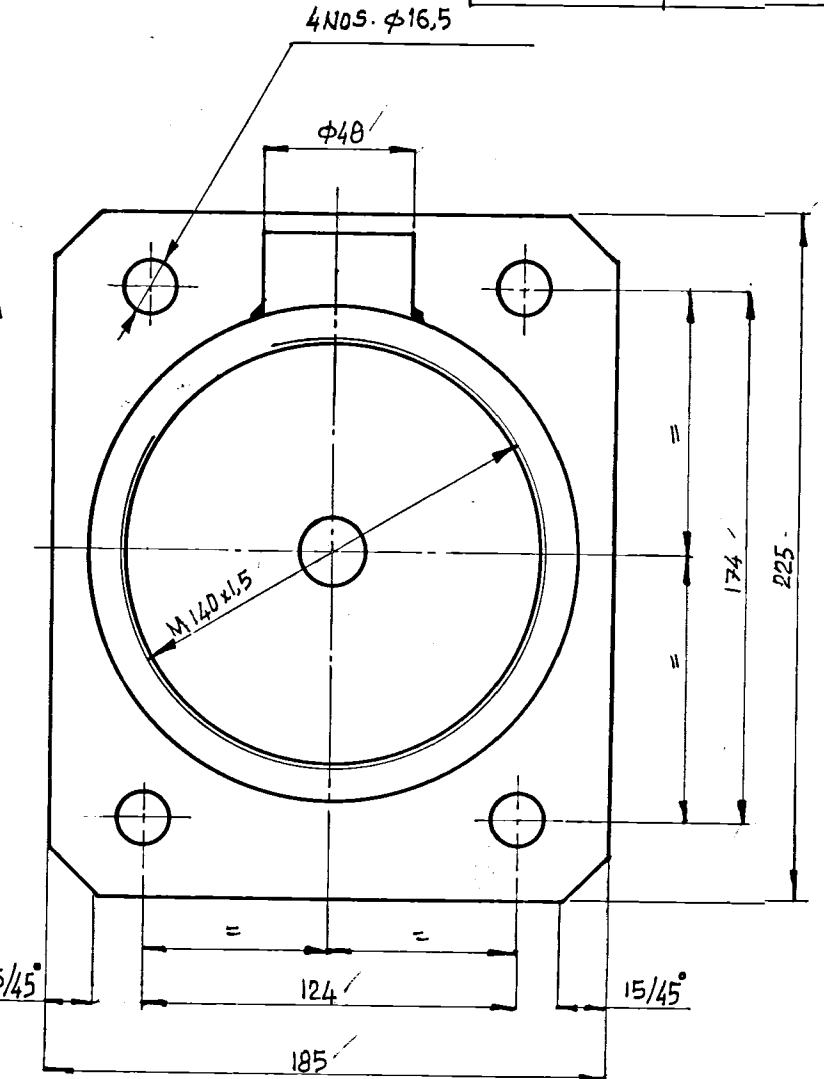
INDEX No 39-608

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 TIRUCHIRAPALLI-620 014

02	1,6	0,4
φ 136H7	+0,040	+0,000



4 NOS. φ6 ON PCD 100  
 DEEP 10.



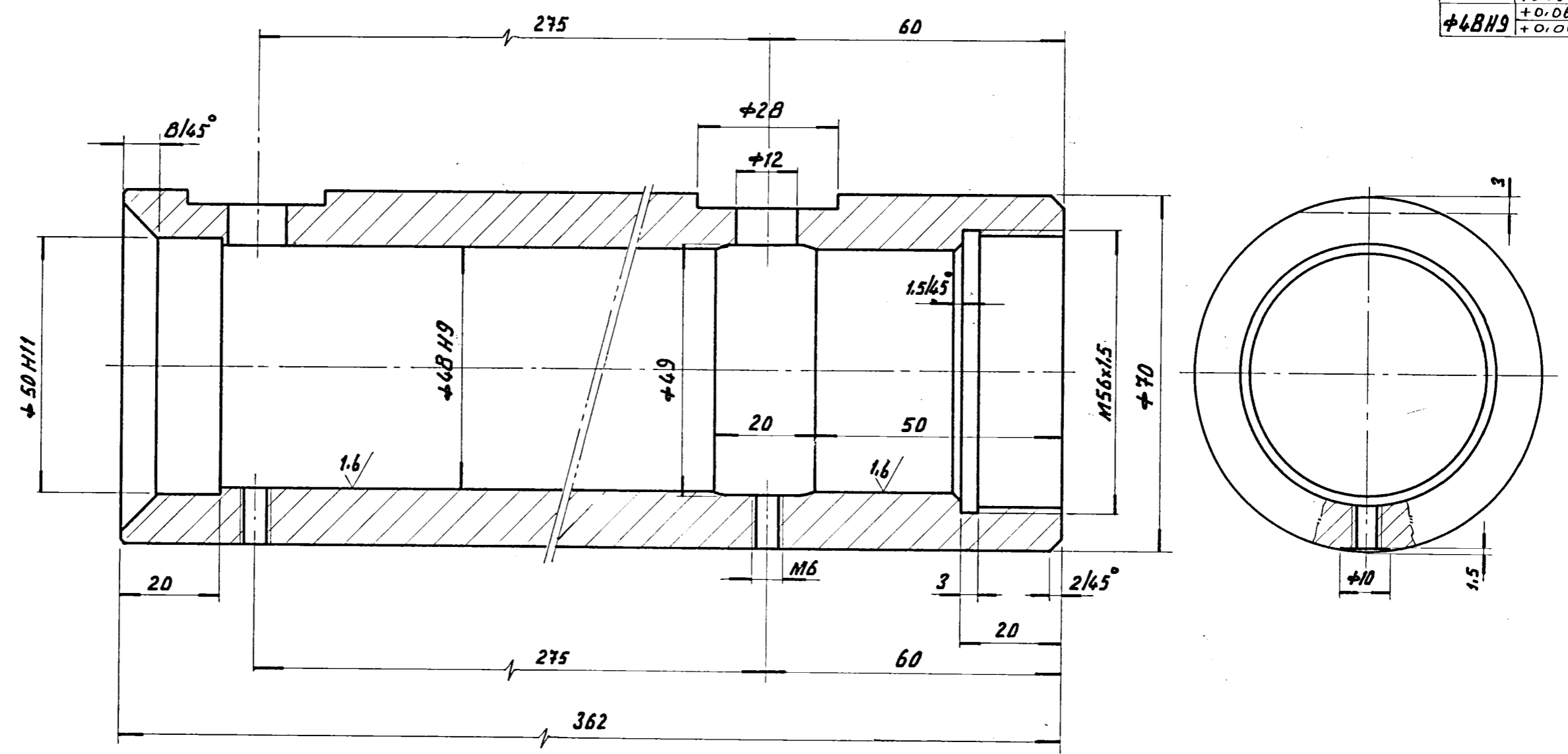
**VIEW-P**

1	STUB	C20-18:2073							
1	END COVER	C20-19:2073							
1	FLANGE	C20-19:2073							

1	PIPE φ 168,3 x 20t - 1582 L.	BS:3602/62 HFS 27						3.M.12a-7691	1
NO. OF PIECES	DESCRIPTION	SEMI-PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT (KG.)	GROSS WT (KG.)	DRAWING NO.	ITEM NO.
REMARKS								TOTAL NET WT. (KG.)	3-M-12a-7691
SCALE	DRAWN	CHECKED	APPROVED	STDS. OFFICER	DATE	REFERENCE	ALTERATIONS	DATE	SIGNATURE
1:25					26.11.79				
	MACHINE	PIPE PENDING		TITLE:		TYPE: CH 6		DRAWING NO.	
				<b>BOOSTER CYL.</b>		3.M.12a-7684		02.	
				[VD-B-136 1250 -100F]		No. OF SHEETS.		SHEET No.:	

125 / 1.6

φ50H11	+0.160
	+0.000
φ48H9	+0.062
	+0.000



1			BM-LQ20 PART III					2-M-12a-0366	1
NO. OF PIECES	DESCRIPTION	SEMI PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET WT	GROSS WT	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET wt (kg)					
SCALE	DRAWN	REFERENCE		ALTERATIONS	DATE	SIGNA- TURE	ALTERATION INDEX		
1:1	CHECKED								
	APPROVED								
	STDS. OFFICER								
	DATE	1-1-1968							
MACHINE: 'MINGORI' PIPE BENDING M/c			TYPE: CH6-127F			INV. NO.			
TITLE: <b>CYLINDER</b>			DRAWING NO: <b>3-M-12a<sup>02</sup>-0990</b>						
NO. OF SHEETS:			SHEET NO:						

