



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 79 38 Fax : +91 431 252 07 19 Email : tvenkat@bheltry.co.in Web : www.bhel.com
NOTICE INVITING TENDER	

TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two Parts	2620900173	03.09.2009	20.10.2009

You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.

Please note that under any circumstances both **delayed offer** and **late offers** will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of **tender opening**.

Item	Description	Quantity
10	Pneumatically Operated Tube Insert Scarfer as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	6 Nos.
20	Pneumatically Operated Tube End Scarfer as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	9 Nos.

Important points to be taken care during submission of offer

1. Delivery required 12 months from the date of purchase order.
2. Grace period of 2 months beyond the above delivery period will be considered.
3. Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.

BHEL's General guidelines / instructions (refer MM/CE/GT/001) including bank guarantee formats and list of consortium banks, commercial terms check-list can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference "2620900173".

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED Manager / Capital Equipment / MM
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PART A
PNEUMATIC TUBE END PREPARATION EQUIPMENT

SECTION – I : QUALIFYING CRITERIA

The BIDDER has to compulsorily meet the following requirements to get qualified for considering the technical offer:

S. No.	REQUIREMENTS	VENDOR's RESPONSE
1	<p>Only those vendors (OEMs), who have supplied and commissioned a minimum of TWO numbers of special purpose pneumatically operated portable metal working machines in the past ten years (from the date of opening of Tender) and such machine is presently working satisfactorily for more than one year after commissioning (from the date of opening of Tender) should quote.</p> <p>However, if such machine had already been supplied to BHEL, then that machine should be presently working satisfactorily for more than six months after it's commissioning and acceptance (from the date of opening of Tender).</p>	
	The vendor should submit following information where similar machine has been supplied for qualification of their offer.	
1.1	Name and postal address of the customer or company where similar machine is installed.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the machine.	
1.5	Application for which the machine is supplied	
1.6	Along with the Technical offer, the Vendor should submit one Performance certificate from the customer for the satisfactory performance of the machine supplied to them. For obtaining the Performance certificate, a suggestive format is provided in SECTION – IV .	
1.7	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	
2.0	<p>DELIVERY - The bidder shall quote the best possible delivery. However the delivery shall not exceed 12 months with an additional grace period of 2 months. The additional grace period will attract a penalty which is explained in the commercial terms of the enquiry.</p> <p>The delivery period shall be reckoned from date of purchase order to despatch from the vendor works.</p>	

3.0	The BIDDER / VENDOR (OEM) shall have a minimum of FIVE Years of Continuous Experience in the Design, Manufacture & Supply of Special Purpose / Custom Built Pneumatically operated portable machines for metalworking.	
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SECTION – I I

The BIDDER / VENDOR is requested to provide the following information:

S. No.	REQUIREMENTS	VENDOR's RESPONSE
4.0	The BIDDER/VENDOR to furnish Reference List of Customers, with full address, details of contact person, where Special Purpose / Custom Built Pneumatically operated portable machines for metalworking have been supplied in the past.	
5.0	Details of Special Purpose / Custom Built Pneumatically operated portable machines for metalworking supplied to other BHEL units, if any. (Year of commissioning, Application, Type)	
6.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Address of Agents / Service Centers in South India.	
7.0	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

SECTION – III

The BIDDER to note:

S. No.	PARTICULARS	VENDOR'S RESPONSE
8.0	The BIDDER / VENDOR shall submit the offer in TWO PARTS. 1. Technical Offer [with PART A & PART B] & commercial offer 2. Price Bid.	
9.0	The Technical Offer shall contain a comparative statement of Technical Specifications demanded by BHEL and Offer Details submitted by the Bidder , against each clause. A just 'CONFIRMED' or 'COMPLIED' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement where specific details are required may lead to disqualification of the Technical Offer.	
10.0	The Technical Offer shall be supported by product Catalogues & Data Sheets and also technical details of Bought-Out-Items with copies of Product Catalogue to the extent possible.	
11.0	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation.	

SECTION – IV

The performance certificate should be produced **on Customer's Letter Head.**

PERFORMANCE CERTIFICATE

1. Supplier of the machine		
2. Make & Model of the M/C		
3. Month & Year of Commissioning		
4. Application for which M/C is used		
5	a. Application b. Machining capability	
6. Performance of the Machine (Strike off whichever is not applicable)		Satisfactory / Good / Average / Not Satisfactory
7. After sales service (Strike off whichever is not applicable)		Satisfactory / Good / Average / Not Satisfactory
8. Any Other remarks		
<div style="display: flex; justify-content: space-between; align-items: flex-end; padding: 10px;"> <div>Date:</div> <div>Signature & Seal of the Authority Issuing the Performance Certificate</div> </div>		

INSERT-SCARFER TECHNICAL SPECIFICATIONS				6 pages
S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
1	PURPOSE/FUNCTION	The equipment is to be used for the edge preparation of rough flame-cut TUBE Ends (coming inside the openings created in Panels made of Tubes) for butt-joint fit-up and welding. The flame-cut ends will be hardened and irregular in the plane of cut.		
a	O.D.Chamfering	Outside Bevelling on the tubes to get a 37.5° and 45.0° angle and 'J' style edge preparation for 'U' seam welding. All the above styles shall have a land of 1.0 mm to 2.0 mm in the edge preparation.		
b	Facing	End Facing of Tubes. i.e., to get a square cut face with smooth finish.		
c	I.D.Boring	Internal Taper Turning in the I.D. of tubes to get a taper angle of 10 ° to 12 ° to the tube axis, and to a minimum depth of 30 mm from the tube end face.		
d	Machining Mode	The above three operations shall be possible to be done independently and in a single setting with proper tool holders.		

S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
2	JOB DETAILS			
a	Diameter Range of Tubes	28.6 mm to 76.1mm (Outside Diameter)		
b	Wall Thickness	Minimum - 3 mm ; Maximum - 12.5 mm		
c	Material	Carbon Steel, Alloy Steel, Stainless Steel		
2 d	Tube End Condition	The tube ends may either of loose/single tubes or flame-cut ends coming by way of making rectangular openings in panels made of tubes or part of tubes coming in tubular coils.		
e	Working Area	The size (length x width) of the slots / openings, where the equipment has to work is only 500mm x 38 mm. Vendor to specify the minimum width of the equipment.		
f	Accuracy of End Preparation Styles	Bevelling Roundness : +/- 0.1 mm Bevelling Angle : +/- 1.0 Degree		
3	MACHINE OPERATION	Pneumatically Operated and run on Compressed Air.		
a	Inlet Air Supply	4.5 -5.0 kg/sq.cm		
b	Filter, Regulator & Lubricator (FRL) Unit	A suitable Air Regulator, Filter & Lubricator unit with metallic casing shall be mounted on the equipment.		

S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
4	MACHINE CONFIGURATION	The equipment shall be of compact and robust construction with high output air-motor, to deliver a relatively high cutting torque for a continuous duty, to meet the specific job application of inserting into the openings created in tubular panels.		
a	Job/Tube Clamping	O.D. Clamping with a Locking Lever actuated by a pneumatic cylinder with speed controller for smooth operation. (suitable base ' V 'clamps for varying job diameter to be provided)		
b	Tube Clamping Force	a. Around 25 k N at an air inlet pressure of 4.5 kg/sq.cm.		
c	Air Motor Output Power	Not less than 4000 W at an air inlet pressure of 4.5 kg/sq.cm.		
d	Spindle Torque	Not less than 65 N m at an air inlet pressure of 4.5 kg/sq.cm.		
e	Noise Level	Not more than 85dB, at a distance of 1.0 Mtr. from the source of sound. Suitable SILENCERS are to be provided.		
f	Spindle Free Speed (at No Load)	Around 350 rpm at an air inlet pressure of 4.5 kg/sq.cm.		
g	Tool Feed	Manual - through a Hand Feed Wheel		
h	Spindle Stroke	Minimum 30 mm		
j	Tube Centering	To be ensured by pneumatic clamping system by means of suitably hardened clamp blocks. Harness level to be mentioned in the offer.		

S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
4 k	Construction	The Machine Body has to be so constructed that the machine can be inserted into tubular panel openings for tube edge preparation.		
I	Location of Parts	Location of Air Motor, Silencer, FRL Unit, etc. shall be such that they do not interfere with the job surface, when the equipment is inserted in the panel openings.		
m	Machine Component	Material /Make		
	Machine Body-Steel	Bidder to Specify		
	Gears: metallic	Bidder to Specify		
	Worm Wheel : metallic	Bidder to Specify		
	Worm : metallic	Bidder to Specify		
	Bolts : high tensile strength	Bidder to Specify		
	Bearings	SKF/TIMKEN make		
	Machine Spindle: hardened & ground	Bidder to Specify		
	Tool Holder-As per drawing 10-T-48-15163	Bidder to Specify		
	All pneumatic components	FESTO , NORGREN or any reputed make acceptable to BHEL.		
	Spindle/Valve Handle: 4 way hand operated type for motor rotation and clamping	Bidder to Specify		
	Machine Painting	Poly Urethane – Apple Green Colour, RAL 6011		
	All air pipings, fittings and other accessories : metallic	supplier to specify		

S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
4	n Lifting Hook	A suitably designed Lifting Hook shall be provided at the top of the machine, for handling by EOT Crane and ensure equilibrium of machine geometry.		
	o Air Couplings	Two sets of Quick Dis-Connect Couplings (size - 3/4 inch) are to be provided with the equipment, for air hose connection.		
	p Weight	Around 200 kgs.		
5	TOOLINGS			
	a O D Clamping Bases (to clamp on to the outer diameter of tubes)	The machine shall be capable of clamping tubes with OD 21.3/31.8/33.7/ 38 / 44.5 / 51.0/ 57.0/60.3/63.5 /76.1mm.(10 sizes)		
	b Cutting Tool	HSS Tool Bits (HSS with COBALT inclusion)		
	c Cutters and Tool Bits	1) 37.5° and 45.0° for O.D.Beveling 2) Facing 3) 10 ° and 12° for I.D.Taper Boring 4) 'J' style for 'U' Seam Weld EP		
6	SPARES			
	a Main Equipment	Complete List of Spares including Air Motor Bearings, Seals, Bushes, set of gears, Spindle, Air Cylinder, Air Valve for Clamp & Revolution, etc. to be LISTED ITEMWISE with quantity.		
	b Cutting Tools	Cutting Heads to hold tool bits, Tool Bits for Cutting Operations mentioned under 5 c to be LISTED ITEMWISE with quantity.		

S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
7	MANUALS			
a	No of Copies	3 (Three) for Each Machine		
b	Language	English		
7 c	O & M Manual Details :	Manual shall contain BLOW-UP details on assembly / dismantling, part numbers with part description for Maintenance, Safety Instructions while using, Operating Sequence for using the equipment for Beveling, Trouble Shooting Chart.		
8	GENERAL			
a	Cost Details	Price break-up shall be given separately for main equipment, accessories, cutting tools, spares, etc.		
b	Inspection/Testing	The equipment shall be offered for inspection by BHEL for performance evaluation, prior to despatch. Test Certificate shall be submitted.		
c	Commissioning	Supplier's representative shall be deputed for commissioning and performance prove-out of the equipment at BHEL works, free of cost.		
d	Guarantee	The equipment shall be guaranteed for a minimum of twenty-four months from the date of commissioning.		
e	Technical Data	The offer shall be accompanied with appropriate technical drawings/leaflets, showing the capability to supply the offered equipment.		

S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
f	Incomplete Offer	The offer without point to point specification confirmation, unpriced price-bid, technical data, list of spares, etc. shall be liable for disqualification, without notice.		

END-SCARFER TECHNICAL SPECIFICATIONS**6 Pages**

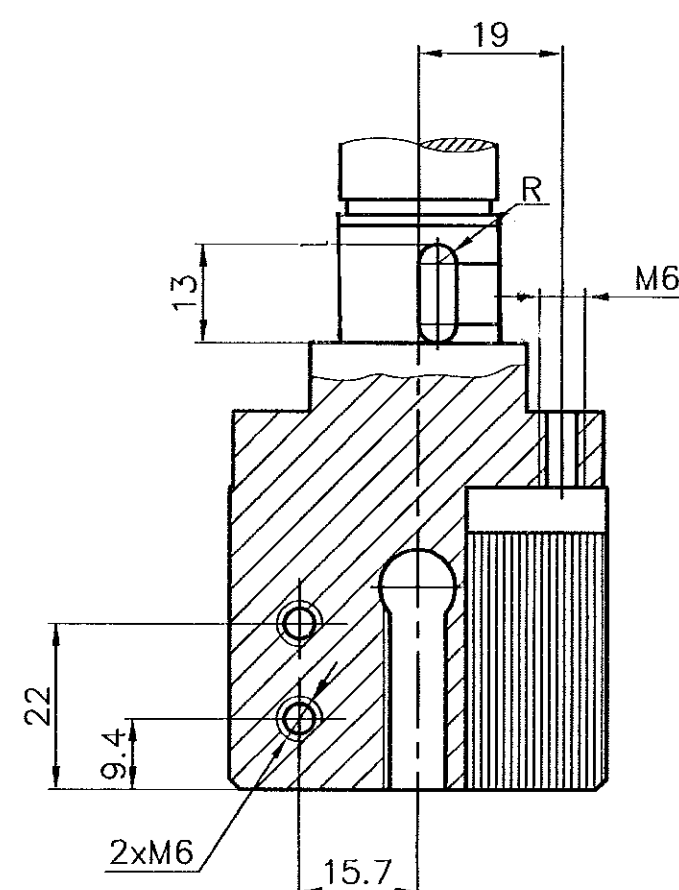
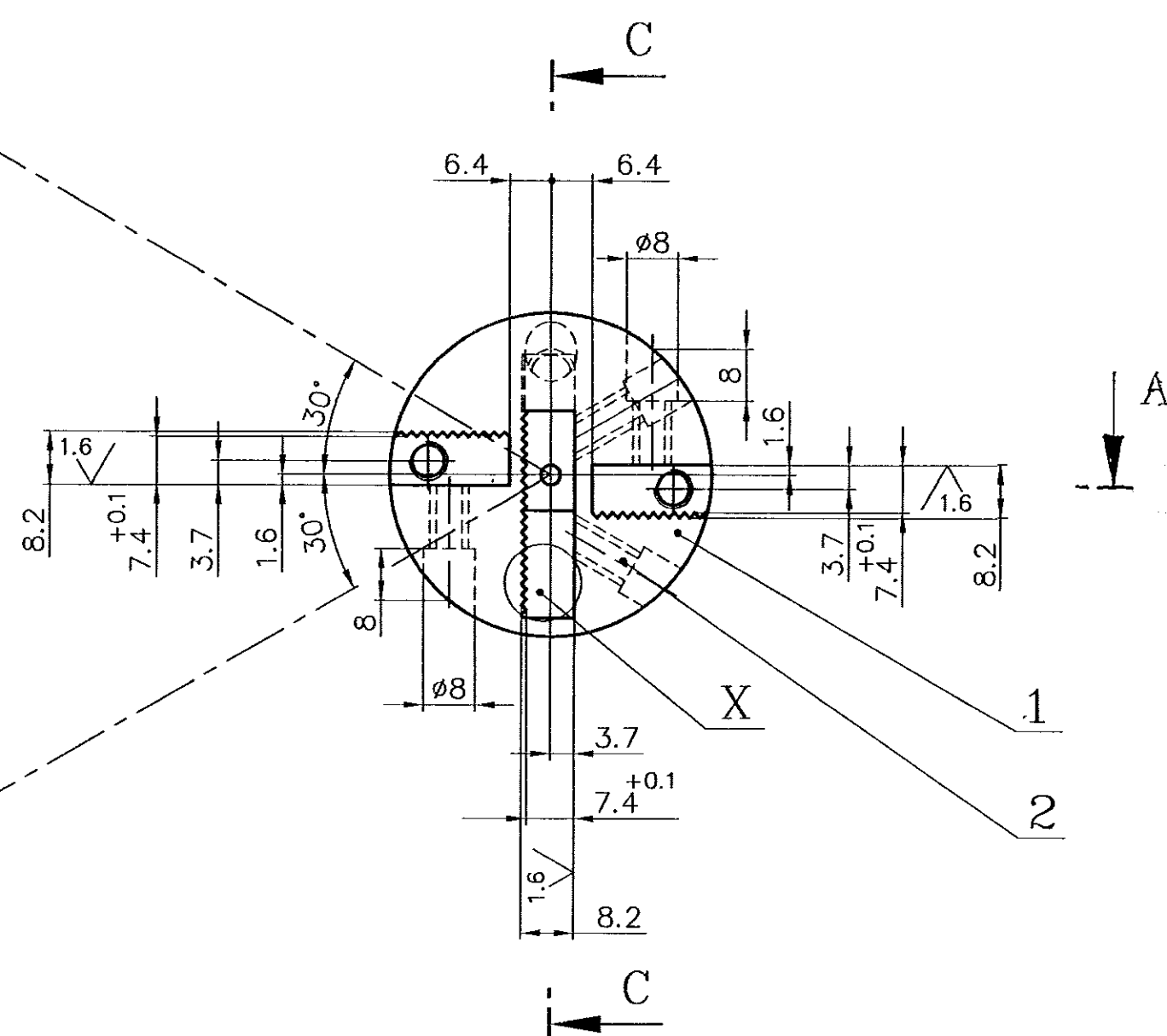
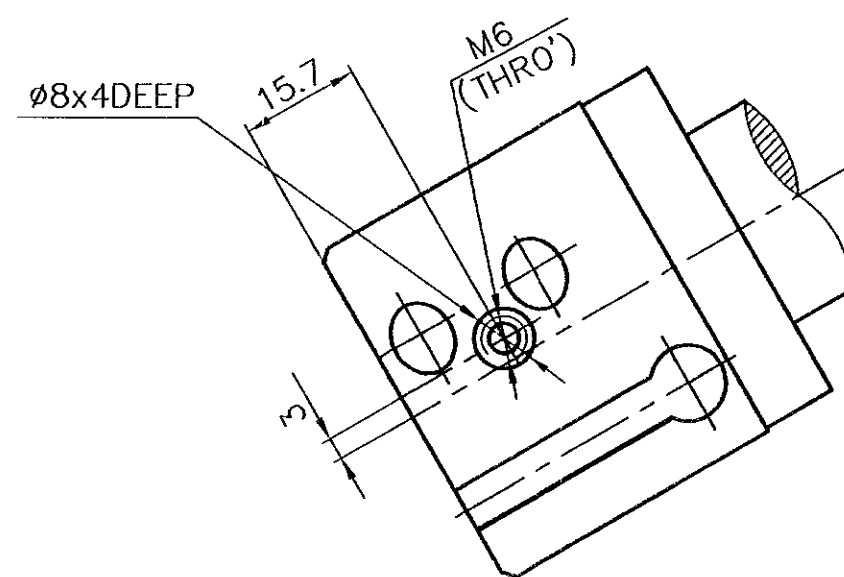
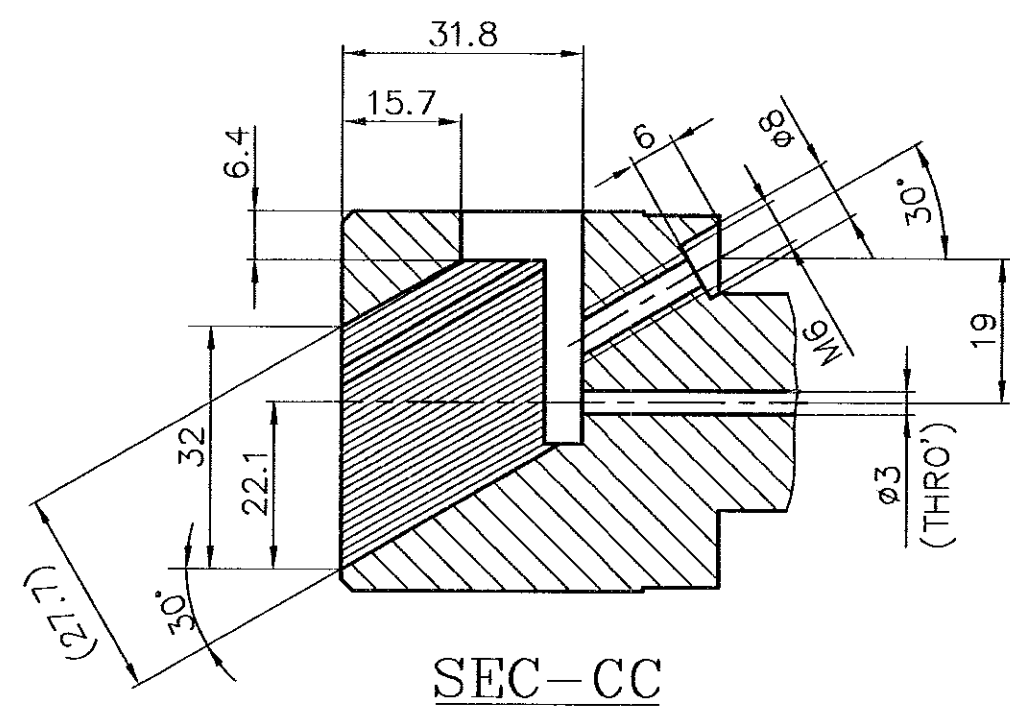
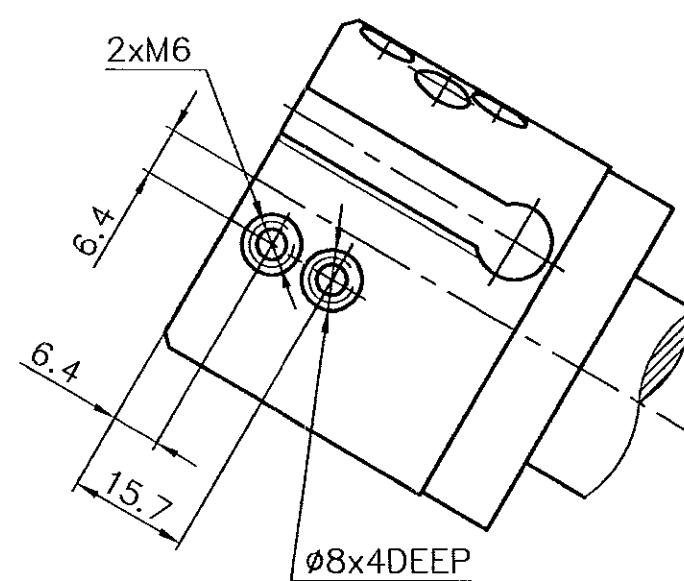
S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
1	PURPOSE/FUNCTION	The equipment is to be used for the edge preparation of rough flame-cut TUBE Ends (coming in High Pressure Boiler Applications) for butt-joint fit-up and welding. The flame-cut ends will be hardened and irregular in the plane of cut.		
a	O.D.Chamfering	Outside Bevelling on the tubes to get a 37.5° and 45.0° angle and 'J' style edge preparation for 'U' seam welding. All the above styles shall have a land of 1.0 mm to 2.0 mm in the edge preparation.		
b	Facing	End Facing of Tubes. i.e., to get a square cut face with smooth finish.		
c	I.D.Boring	Internal Taper Turning in the I.D. of tubes to get a taper angle of 10 ° to 12 ° to the tube axis, and to a minimum depth of 30 mm from the tube end face.		
d	Machining Mode	The above three operations shall be possible to be done independently and in a single setting with proper tool holders.		

S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
2	JOB DETAILS			
a	Diameter Range of Tubes	28.6 mm to 76.1mm (Outside Diameter)		
b	Wall Thickness	Minimum - 3 mm ; Maximum - 14 mm		
c	Material	Carbon Steel, Alloy Steel, Stainless Steel		
d	Tube End Condition	The tube ends may either of loose/single tubes or flame-cut ends coming at the end of panels made of tubes or part of tubes coming in tubular coils.		
e	Accuracy of End Preparation Styles	Bevelling Roundness : +/- 0.1 mm Bevelling Angle : +/- 1.0 Degree		
3	MACHINE OPERATION	Pneumatically Operated and run on Compressed Air.		
a	Inlet Air Supply	4.5 -5.0 kg/sq.cm		
b	Filter, Regulator & Lubricator (FRL) Unit	A suitable Air Regulator, Filter & Lubricator unit with metallic casing shall be mounted on the equipment.		
4	MACHINE CONFIGURATION	The equipment shall be of compact and robust construction with high output air-motor, to deliver a relatively high cutting torque for a continuous duty, to meet the specific job application. The following parameters are only for design guidance.		
a	Job/Tube Clamping	O.D. Clamping with a Locking Lever actuated by a pneumatic cylinder with speed controller for smooth operation.(suitable base ' V 'clamps for varying job diameter to be provided)		

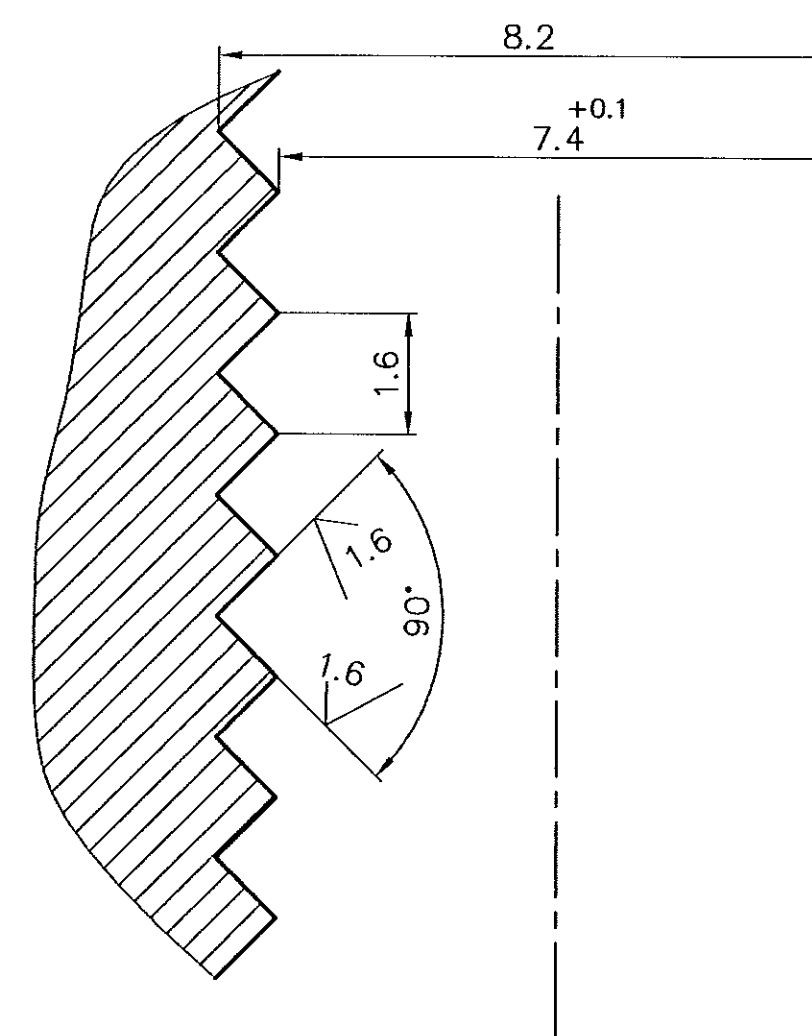
S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
4 b	Tube Clamping Force	Not less than 28 k N at an air inlet pressure of 4.5 kg/sq.cm.		
c	Air Motor Output Power	Not less than 4.2 k W at an air inlet pressure of 4.5 kg/sq.cm.		
d	Spindle Output Toque	Bidder to SPECIFY but NOT less than 68 Nm at an air inlet pressure of 5 kg/sq.cm.		
e	Noise Level	Not more than 85dB, at a distance of 1.0 Mtr. from the source. Suitable SILENCERS are to be provided.		
f	Spindle Free Speed (at No Load)	Not less than 350 rpm at an air inlet pressure of 4.5 kg/sq.cm.		
g	Tool Feed	Manual - through a Hand Feed Wheel		
h	Tube Centering	To be ensured by pneumatic clamping system by means of suitably hardened clamp blocks. Harness level to be mentioned in the offer.		
j	Spindle Stroke	Minimum 30 mm		
k	Machine Component	Material /Make		
	Machine Body-Steel	Bidder to Specify		
	Gears: metallic	Bidder to Specify		
	Worm Wheel : metallic	Bidder to Specify		
	Worm : metallic	Bidder to Specify		
	Bolts : high tensile strength	Bidder to Specify		
	Bearings	SKF/TIMKEN make		
	Machine Spindle: hardened & ground	Bidder to Specify		
	Tool Holder- As per drawing 10-T-48-15152	Bidder to Specify		
	All pneumatic components	FESTO , NORGREN or any reputed make acceptable to BHEL.		

S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
	Spindle/Valve Handle: 4 way hand operated type for motor rotation and clamping	Bidder to Specify		
	Machine Painting	Poly Urethane – Apple Green Colour, RAL 6011		
	All air pipings, fittings and other accessories : metallic	supplier to specify		
l	Base of Machine	Suitable for placing the machine on floor (standing steady due to self-weight) for loose tube end machining.		
m	Lifting Hook	A suitably designed Lifting Hook shall be provided at the top of the machine, for handling by EOT Crane and shall ensure equilibrium while holding.		
n	Air Couplings	Two sets of Quick Dis-Connect Couplings (size - 3/4 inch) are to be provided with the equipment, for air hose connection.		
p	Weight	Vendor to Specify-Around 225 kgs.		
5	TOOLINGS			
a	O D Clamping Bases (to clamp on to the outer diameter of tubes)	The machine shall be capable of clamping tubes with OD 21.3/31.8/33.7/ 38 / 44.5 / 51.0/ 57.0/60.3/63.5 /76.1mm.(10 sizes)		
b	Cutting Tool	HSS Tool Bits (HSS with COBALT inclusion)		
c	Cutters and Tool Bits	1) 37.5° and 45.0° for O.D.Beveling 2) Facing 3) 10 ° and 12° for I.D.Taper Boring 4) 'J' style for 'U' Seam Weld EP		

SEC-BB

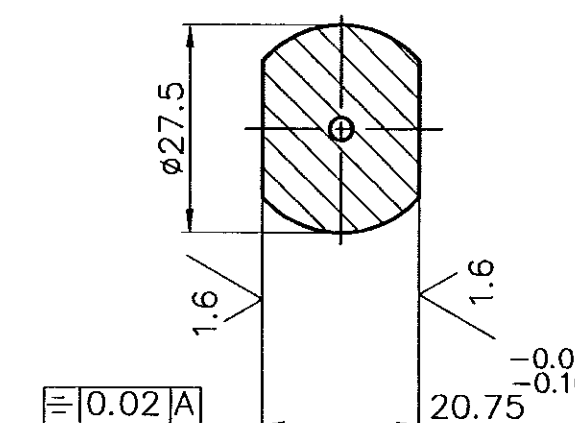
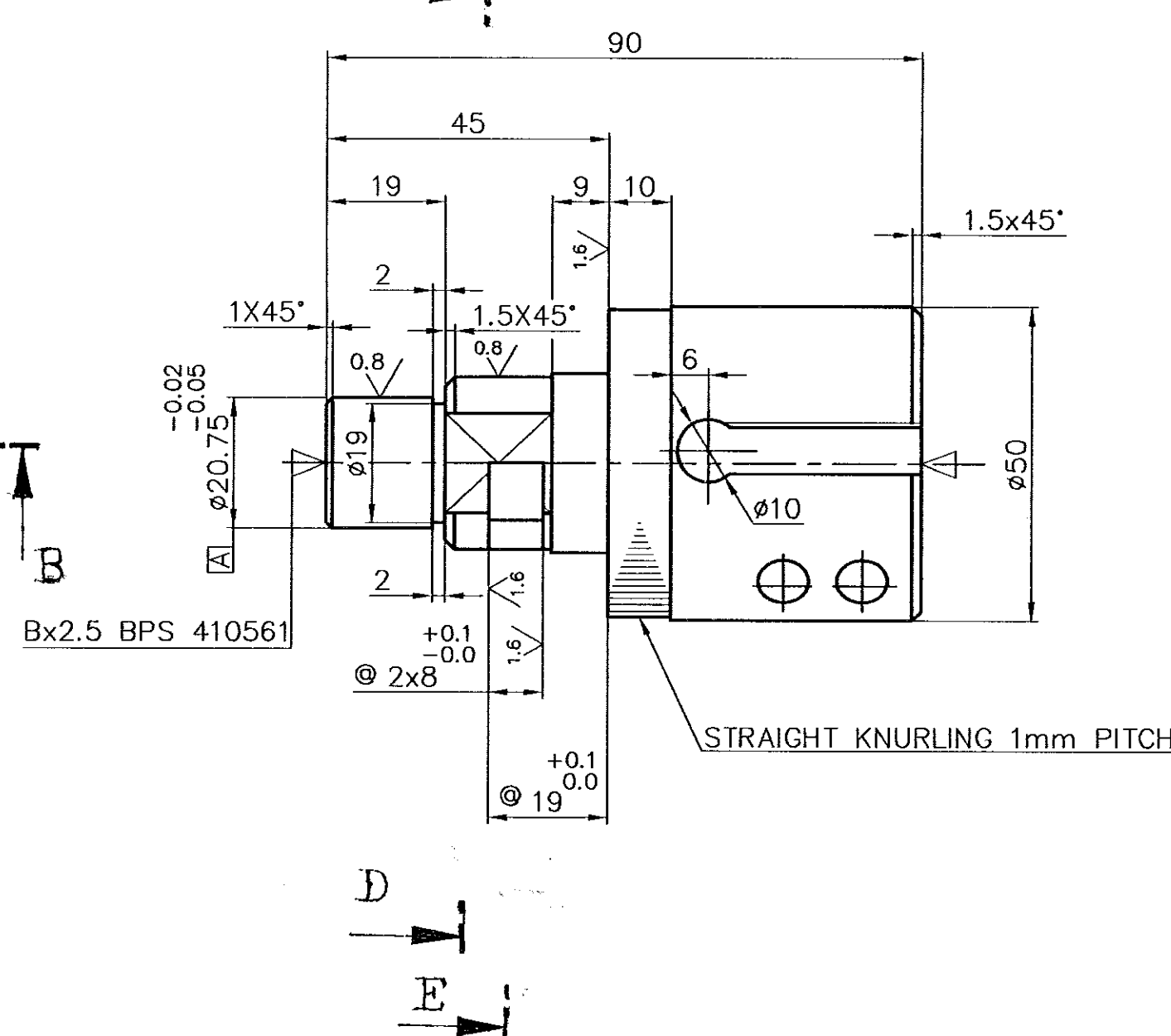


SEC- AA

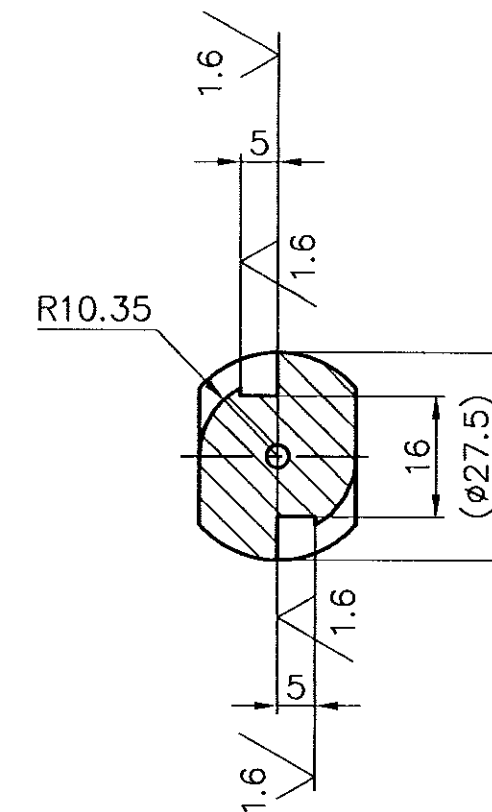


DETAIL 'X' SERRATIONS

SCALE: -10:1



SEC- DD



SEC-EE


3.2 1.6 0.8

TOLERANCE FOR UNTOLERANCED DIMENSIONS

UPTO 6 MM	= ±0.1 MM
> 6 UPTO 120 MM	= ±0.2 MM
MORE THAN 120 MM	= ±0.5 MM
ANGULAR TOLERANCE	= ±0.5 Deg
CHAMFER	= ±0.5 Dec

10	ALLEN GRUB SCR M6x20	(IS-6094-A-45H-CD)							2
1	HOLDER Ø50x90		IS: 570 13 Ni 3Cr 80	0.93					1
NO. OF PIECES	DESCRIPTION	SEM. PRG/SEQ. NO.	INT. MAT/SEQ. NO.	FINAL MATERIAL	GROUP SORT	NET WT.(KG)	GROSS WT.(KG)	DRAWING NO	ITEM NO
COMP. DRG. NO.	-		TOOL NO :- 48-14114-00 RANGE: Ø4.5 TO Ø51						
COMP. DESC.	TUBES								
GROUP:	06.231	W.C: - 5991							

BHARAT HEAVY ELECTRICALS LTD.,
BOILER PLANT UNIT, TIRUCHIRAPALLI-14

FIRST ANGLE.	SCALE 1:1 10:1	DRAWN R.VINOTH KUMAR	TOTAL NET WT.KG	0.93
		CHECKED <i>[Signature]</i>	TYPE	
		APPROVED <i>[Signature]</i>		
ALL DIMENSIONS IN MILLIMETRES.		DATE 19.05.05.	NEW/OLD DRG NO.	

CAUTION

[illegible]

TOOL HOLDER (INSERT SCARFING M/C)	
DRAWING NO.	REVISION

10-T-48-15163 A

A	DATE	ALTERED SSP	
	7.12.84	CHECKED	BKR
ZONE	+0.1	+0.1	
Q	19 ^{+0.0}	& 2x8 ^{+0.0}	WERE
	19 ^{+0.01}	& 2x8 ^{+0.05}	

S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
6	SPARES			
a	Main Equipment	Complete List of Spares including Air Motor Bearings, Seals, Bushes, set of gears, Spindle, Air Cylinder, Air Valve for Clamp & Revolution, etc. to be LISTED ITEMWISE with quantity.		
b	Cutting Tools	Cutting Heads to hold tool bits, Tool Bits for Cutting Operations mentioned under 5.c to be LISTED ITEMWISE with quantity.		
7	MANUALS			
a	No of Copies	3 (Three) for Each Machine		
b	Language	English		
c	O & M Manual Details :	Manual shall contain BLOW-UP details on assembly / dismantling, part numbers with part description for Maintenance, Safety Instructions while using, Operating Sequence for using the equipment for Beveling, Trouble Shooting Chart.		

CABS-12N- Pneumatic Tube Insert Scarfer and End scrafer-Part-B

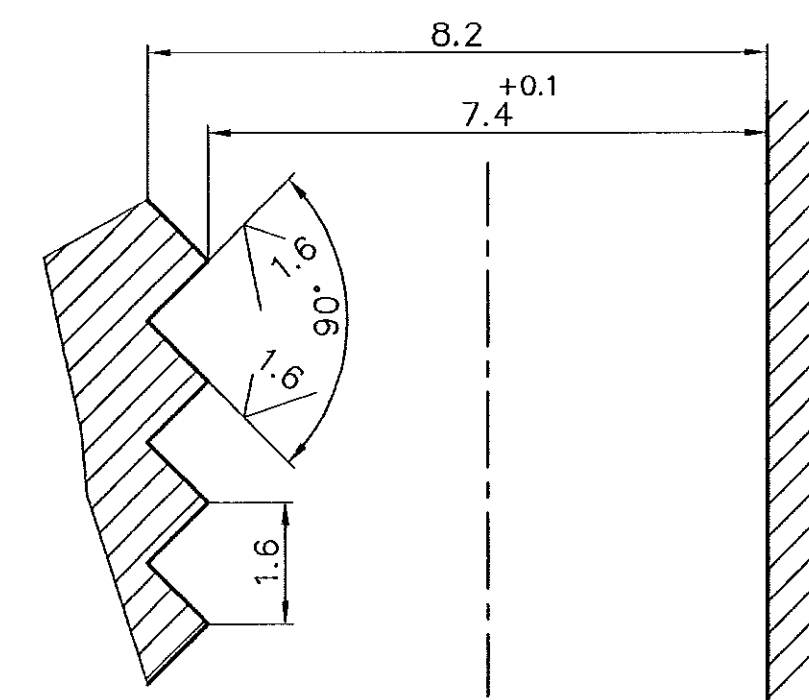
S.No.	EQUIPMENT FEATURES	BHEL SPECIFICATION	SUPPLIER'S SPECIFICATION	DEVIATIONS
8	GENERAL			
a	Cost Details	Price break-up shall be given separately for main equipment, accessories, cutting tools, spares, etc.		
b	Inspection/Testing	The equipment shall be offered for inspection by BHEL for performance evaluation, prior to despatch. Test Certificate shall be submitted.		
c	Commissioning	Supplier's representative shall be deputed for commissioning and performance prove-out of the equipment at BHEL works, free of cost.		
d	Guarantee	The equipment shall be guaranteed for a minimum of twenty-four months from the date of commissioning.		
e	Technical Data	The offer shall be accompanied with appropriate technical drawings / leaflets, showing the capability to supply the offered equipment.		

CARBO NITRIDE TO 0.65mm DEPTH HARDEN
& TEMPER TO 55 TO 58 HRc.

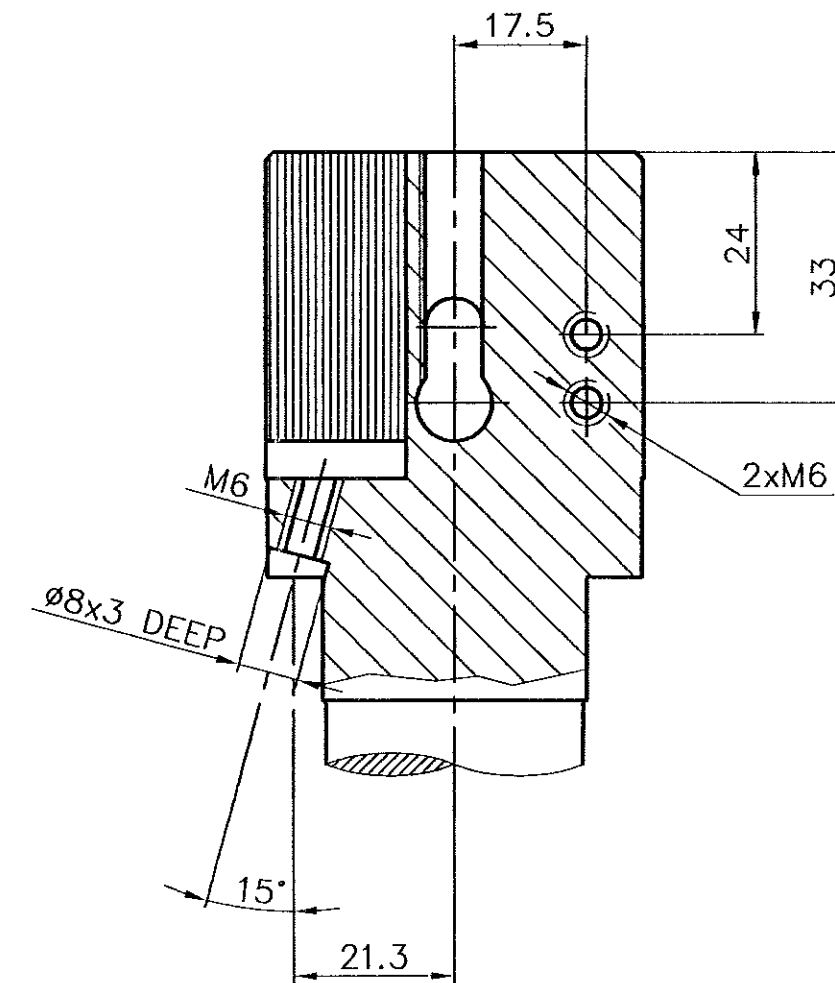
CHAMFER ALL SHARP EDGES.

3.2 1.6 0.8

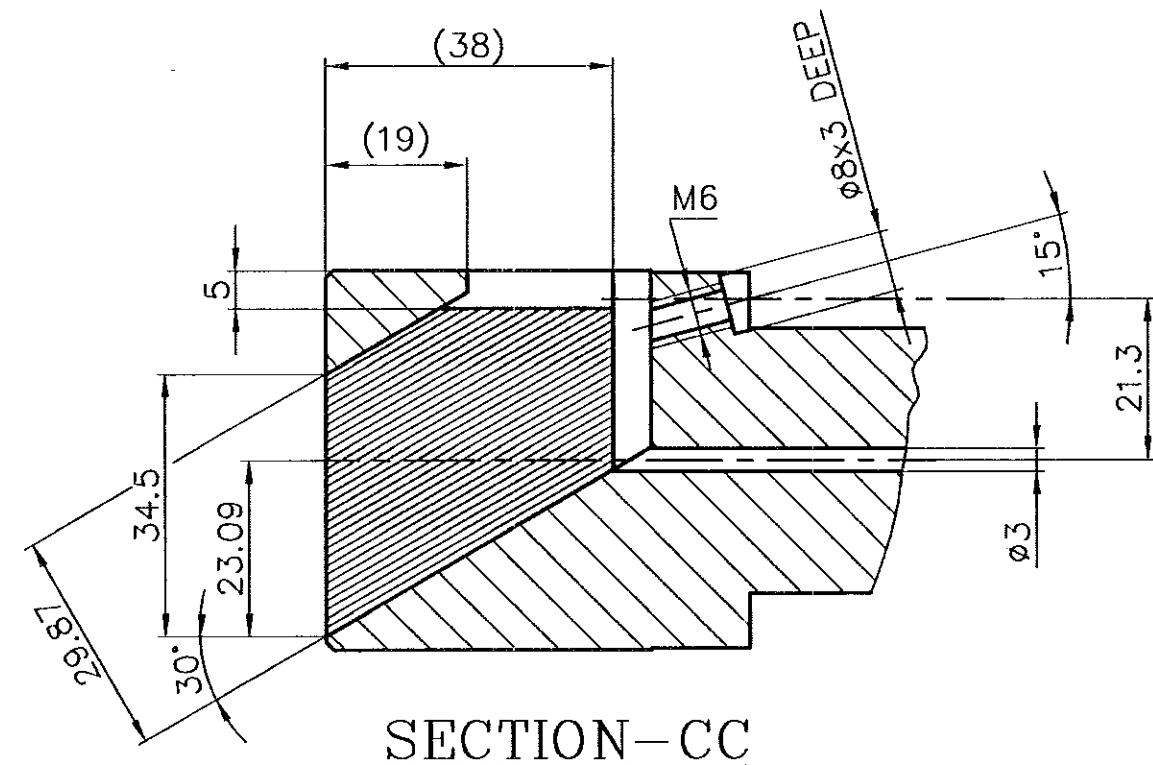
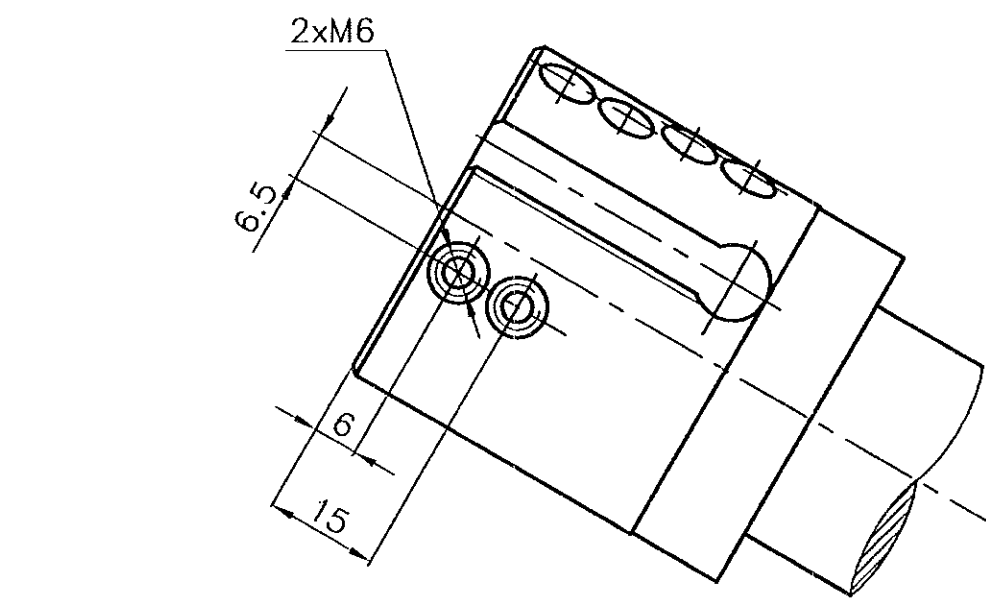
TOLERANCE FOR UNTOLERANCED DIMENSIONS	
UPTO 6 MM	= ± 0.1 MM
> 6 UPTO 120 MM	= ± 0.2 MM
MORE THAN 120 MM	= ± 0.5 MM
ANGULAR TOLERANCE	= ± 0.5 Deg
CHAMFER	= ± 0.5 Deg



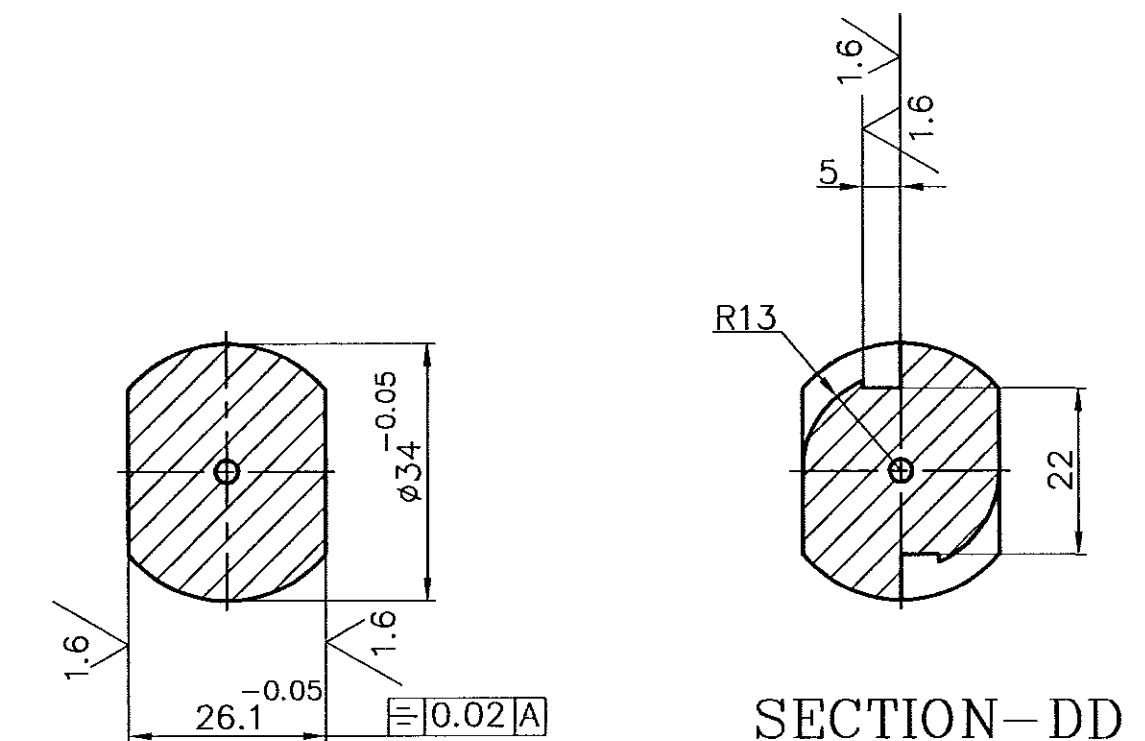
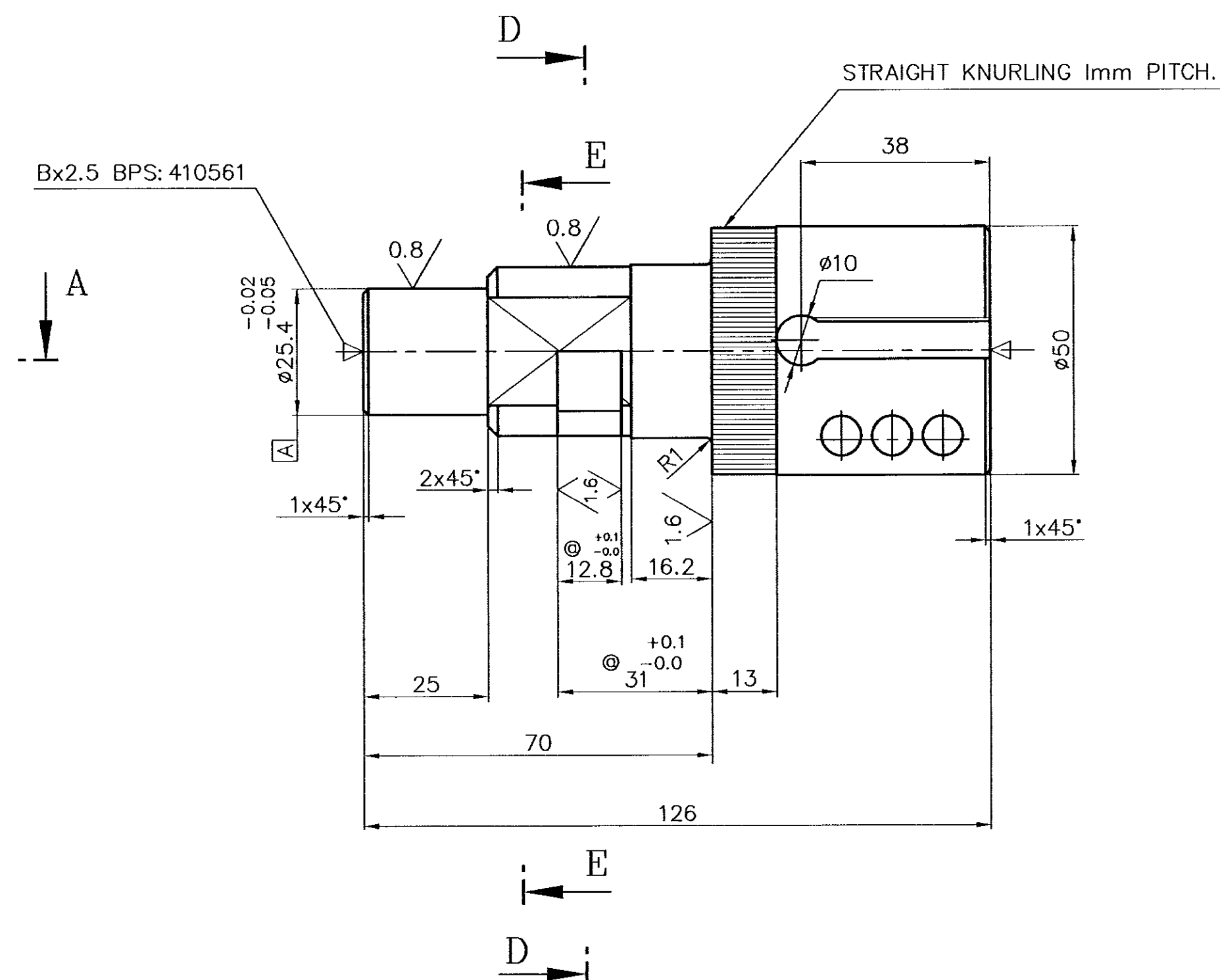
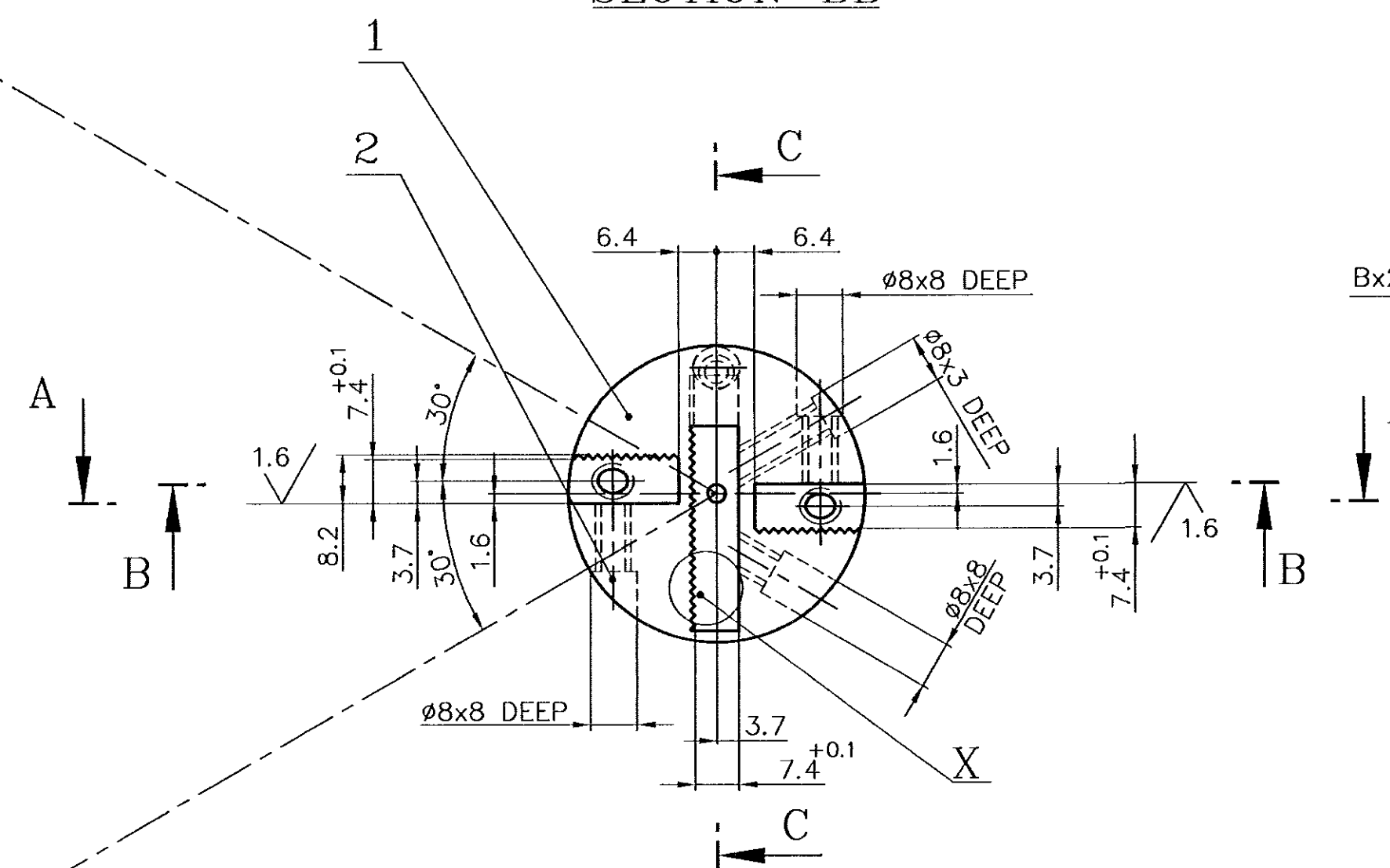
DETAIL 'X' SERRATIONS
SCALE; -10:1



SECTION-BB

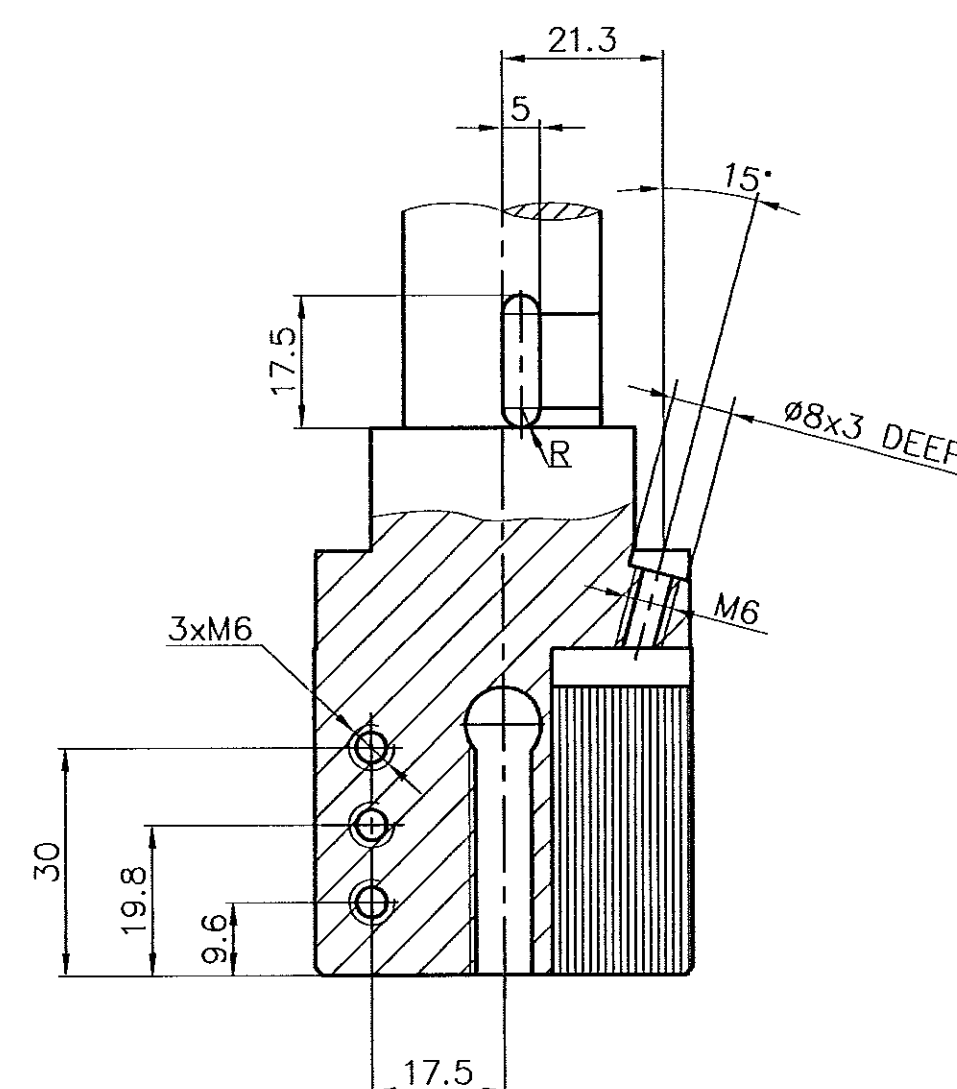
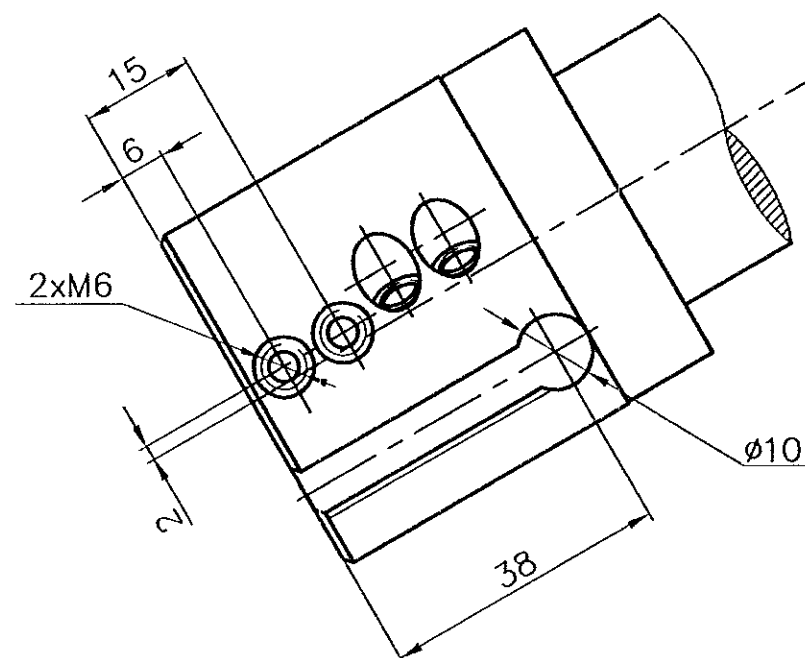
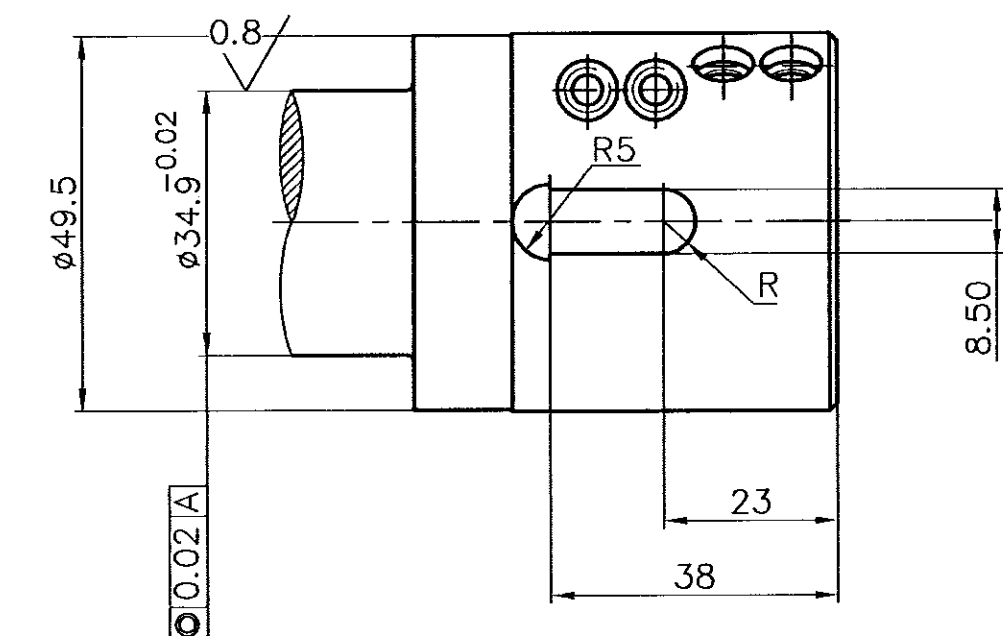


SECTION—CC



SECTION-DD




SECTION—EE



SECTION-AA

12	ALLEN GRUB SCR M6x20	(IS-6094--A--45H-CD)							2
1	HOLDER Ø50x126		IS: 1570 13 Ni 3Cr 80		1.4				1
NO. OF PIECES	DESCRIPTION	SEM. PRO/SED. NO.	INT. MAT/SED. NO.	FINAL MATERIAL	GROUP SORT	NET WT.(KG)	GROSS WT.(KG)	DRAWING NO	ITEM NO
COMP. DRG. NO.				<div style="border: 2px solid black; padding: 10px;"> TOOL NO :- 48-14110-00 RANGE: Ø44.5 TO Ø51 </div>					
COMP. DESC.		TUBES							
GROUP:		06.231	WC: 4395						

BHARAT HEAVY ELECTRICALS LTD.,
BOILER PLANT UNIT, TIRUCHIRAPALLI-14

FIRST ANGLE. 	SCALE 1:1 10:1	DRAWN R.VINOTH KUMAR	TOTAL NET WT.KG 1.4
		CHECKED 	TYPE
		APPROVED 	
		DATE 19 05 05	NEW/OLD DRG NO.
ALL DIMENSIONS IN MILLIMETRES.			

CAUTION

DRAWING IS THE PROPERTY OF
BHARAT HEAVY ELECTRICALS LTD
BOILER PLANT UNIT, TIRUCHY-14
AND SHALL NOT BE USED WITHOUT THEIR
EXPRESS WRITTEN PERMISSION IN ANY
FORM OR PART THEREOF FOR ANY OTHER
PURPOSE THAN FOR WHICH IT IS SENT

TOOL HOLDER

TOOL HOLDER (END SCARFING M/C)									
DRAWING NO.					REVISION				

DRAWING NO.	REVISION
10-T-48-15152	A

A	DATE	ALTERED	BKR
	7-12-84	CHECKED	BKR
ZONE	31 ^{+0.1} & 12.8 ^{+0.1} WERE		
@	31 ^{+0.05} & 12.8 ^{+0.05} -0.0		