

Item Details & Technical Specifications

Item Details

Item wise Technical Specifications		
Enq. Item SL.No	Item Description and Technical Specifications	Qty (Nos)
10	FIBROTHAL BOARD EMBEDDED HEATING ELEMENT	4
20	KANTHAL A1 WIRE (4.8MM) HEATING ELEMENT	6
30	CERAMIC TUBE L800xDIA22xT3	24
40	CERAMIC COLLAR TUBE FOR TERMINAL STUD	12
50	SS310 TERMINAL ROD 12MM DIA	24
60	U-TUBE EMBEDDED HEATING ELEMENT 1.67kW	12
70	U-TUBE EMBEDDED HEATING ELEMENT 3.33kW	6
80	CERAMIC BOBBIN	100

Item No: 10

Cylindrically formed Fibrothal board embedded heating element

Quantity: 4 Nos

<Item Text>

Cylindrically formed Fibrothal board embedded heating element

Refer Drawing No. DRG: BHEL: U2: 001 and DRG: BHEL: U2: 002

Inner diameter of the of the Fibrothal insulation: 750mm

Number of segments of the Fibrothal board: 3

Thickness of the fibrothal board: 125mm

Placement of heating element: In the grooves provided on the inner surface of the fibrothal board.

Total power rating of the furnace: 36kW

No of segments in the furnace: 3

Power rating of one segment: 12kW

Rated voltage of one segment: 230VAC (star connection of all 3 segments)

Element material: Kanthal A1

Operating temperature: 900 degrees Celsius

Element resistance: 4.135 Ohm

Wire diameter: 5mm

Coil Outer Diameter:30mm

Coil inner diameter: 20mm

Pitch: 8.4mm

Total no of turns: 713

No of divisions of coil: 8

Distance between divisions: 80mm

No of turns in each division: 89

Length of each division: 750mm

<Item Note>

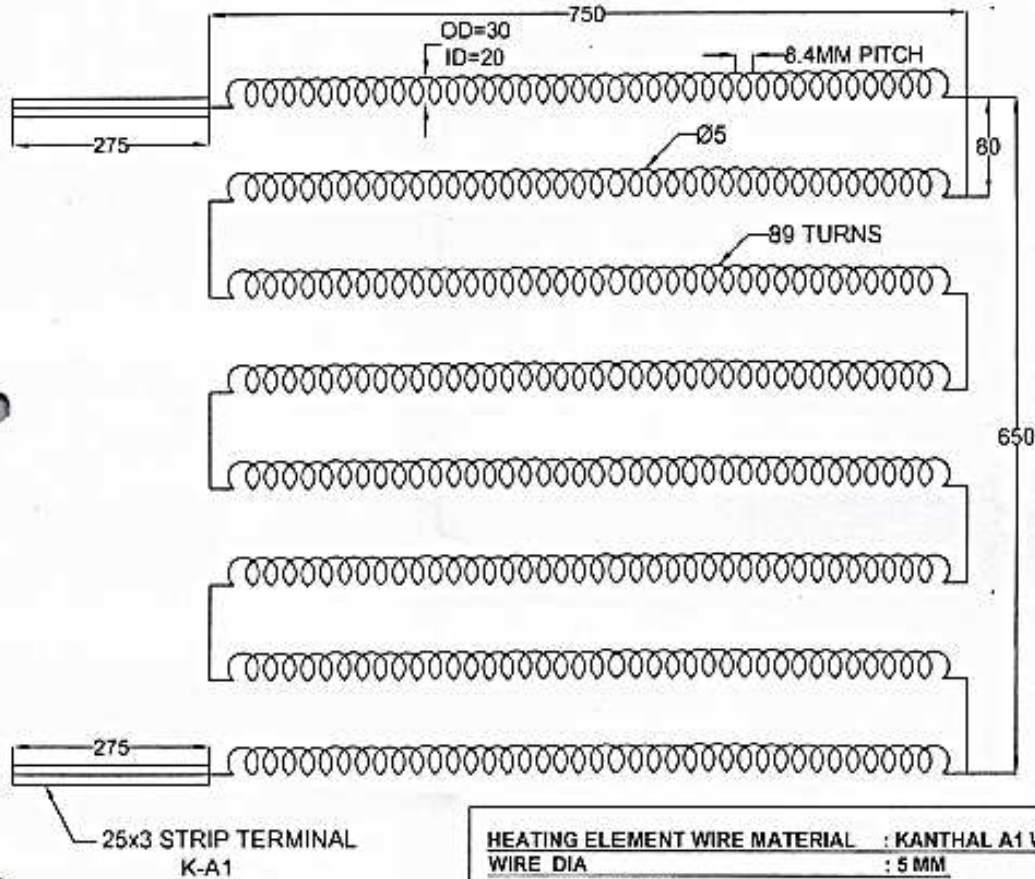
Note:

1. Mechanical assembly drawing (Drawing No: DRG: BHEL: U2: 002) and heating element circuit drawing (Drawing No: DRG: BHEL: U2: 001) is attached for reference.
2. One number of the item means one segment, and one segment means fibrothal embedded heating coil assembly consisting one third of the total cylindrical coil assembly.
3. Vendor may visit BHEL works to inspect the furnace before quoting for the same.
4. Final drawings shall be submitted to BHEL for approval before manufacturing.

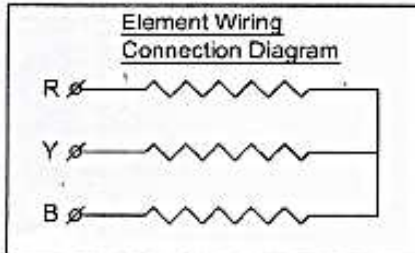
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PERMISSION IN WRITING

DRG: BHEL: U2: 001

COIL TYPE HEATING ELEMENT DIAGRAM



HEATING ELEMENT WIRE MATERIAL	: KANTHAL A1 WIRE
WIRE DIA	: 5 MM
COIL OUTSIDE DIA	: 30 MM
COIL INNER DIA	: 20 MM
PITCH	: 8.4 MM
LENGTH OF EACH DIVISION	: 750 MM
NO. OF TURNS IN EACH DIVISION	: 89Nos
NO. OF DIVISION	: 8Nos
TOTAL NO. OF TURNS	: 713Nos
TERMINAL STRIP SIZE	: 25x3MM
VOLTAGE / ELEMENT	: 230V,AC
POWER / ELEMENT	: 12 KW
TOTAL POWER RATING	: 36 KW
RESISTANCE / ELEMENT	: 4.135 OHMS
MAXIMUM TEMPERATURE	: 900°C
OPERATING TEMPERATURE	: 750°C
NO. OF ELEMENT	: 3Nos

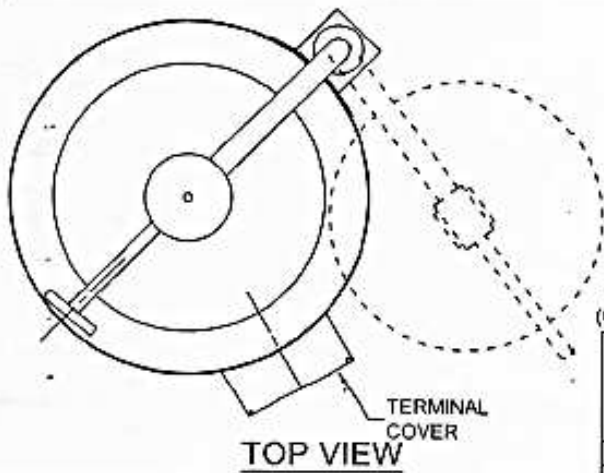
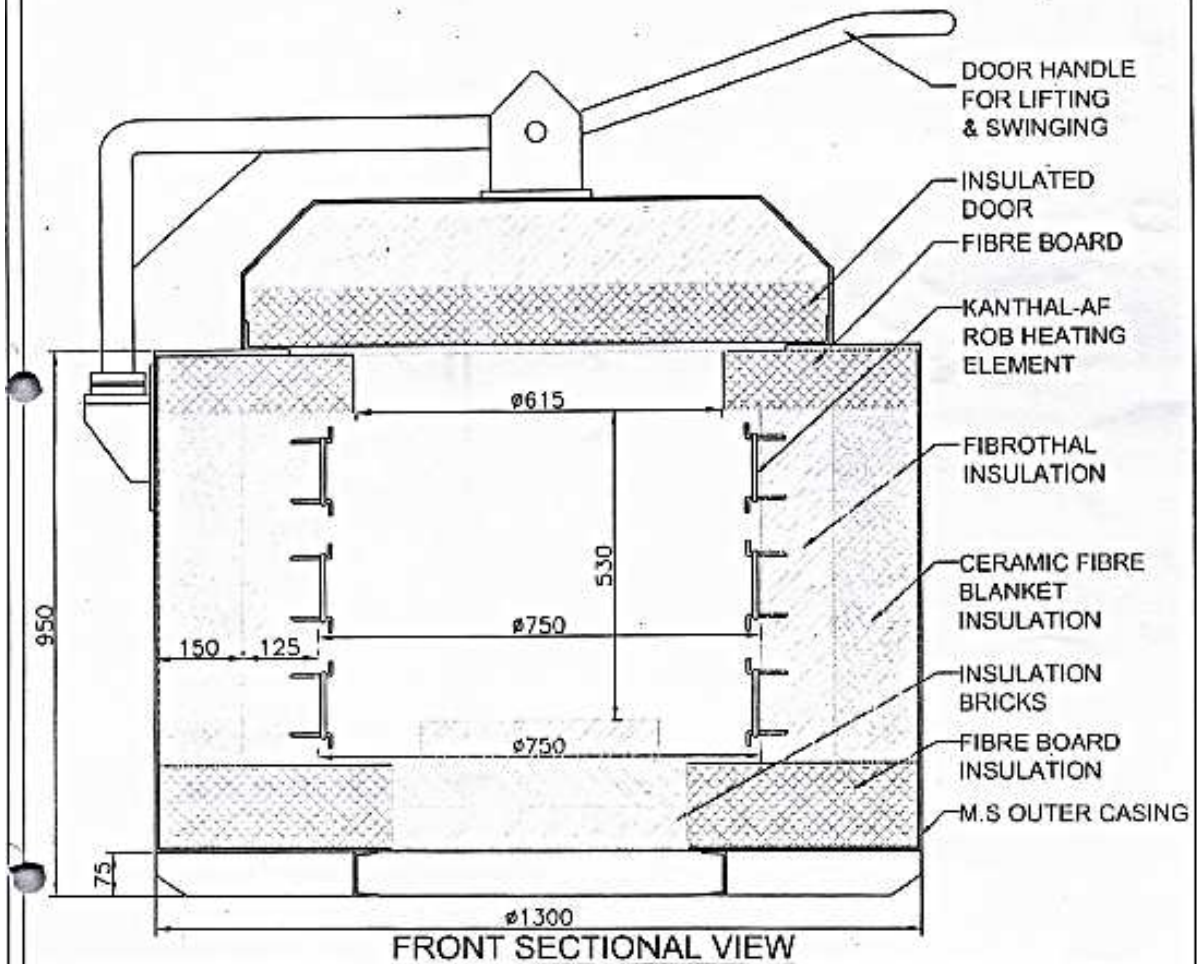


MAJOR SPECIFICATIONS

CHAMBER SIZE	: #750MM x 630MM H
MAXIMUM TEMPERATURE	: 900°C
POWER RATING	: 36KW
NUMBER OF ZONES	: 1NO
POWER SUPPLY	: 415V,3PH,50HZ,AC

THERELEK ENGINEERS PVT LIMITED BANGALORE - 58		DATE	11-08-08
DESIGNED	APPROVED	DATE	
DRG NO	TE-3726	PROJECT NO	PS1/7/08BY
SCALE	1:1	NO OF SHEETS	31/3
THERELEK ELECTRICALLY HEATED POST WELDING FURNACE		DATE	11/08/08

ELECTRICALLY HEATED FURNACE



MAJOR SPECIFICATIONS:
 USEFUL CHAMBER : Ø600 x 530MM HI
 MAX TEMP: 900°C
 OPERATING TEMP: 850°C
 POWER RATING : 39 kW
 POWER SUPPLY : 415V,3Φ,50Hz AC

DOOR
(OPEN)

THERELEK ENGINEERS, BANGALORE

70/71, THIRD PHASE, PEENYA INDUSTRIAL AREA, BANGALORE-56,
 PH. 080-28385101/02 FAX 28385103 WEB: www.therelek.com

CUSTOMER: BHEL,Trichy	FILE: 5-31/D WORK ORDER
DRG. No: [REDACTED]	DATE: 17/10/08 REV. No: 09

Heating Element



Furnace



Item No.20

KANTHAL A1 WIRE (4.8MM) HEATING ELEMENT

Quantity: 6 Nos

<Item Text>

Kanthal A1 - Formed Heating Element - ready to use.

Element Details: Refer Drawing No. BHEL: U2: 005

1. Material: Kanthal A1 grade
2. Cross section of the heating element: dia 4.8mm wire
3. Power rating of the element: 7kW @230VAC (Star Connection)

Forming Details of the Element:

1. Formation of element: By joining four divisions in series. Each division of coil consist of 69 turns wound with turn OD-33mm along a length of 690mm with pitch-10mm. 100mm of wire is left between divisions for placement of coil in the oven.
2. Coil OD: 33mm
3. No of turns per division: 69
4. Pitch of coiling: 10mm approx.
5. Length of a coil: 690mm
6. No of division of coil per element: 4
7. Connection of divisions in the coil: series
8. Total no of turns in the coil = $4 \times 69 = 276$
9. spacing between divisions: 100mm
10. Length of wire at terminal end: 400mm

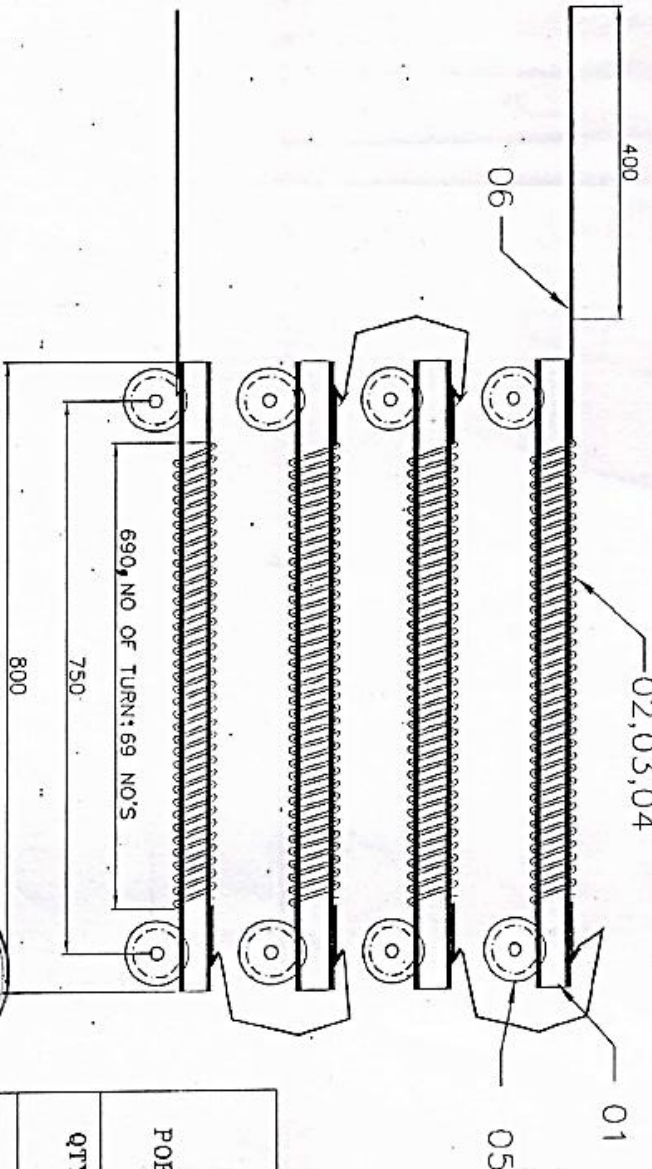
<Item Note>

Note:

1. Detailed drawing of the heating element (Drg No: 014-01-03 / DRG: BHEL: U2: 005) and the mechanical assembly drawing of the furnace (Drg No: 014-01-01 / DRG: BHEL: U2: 006) is attached for reference.
2. Vendor may visit BHEL works to inspect the furnace before quoting for the same.
3. The element shall not have any welded joints in between.
4. Final drawings shall be submitted to BHEL for approval before manufacturing

DRG: BHEL: U1: 005

ITEM NO. 30



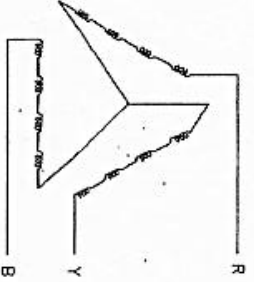
- 01. CERAMIC TUBE = OD22,L800
- 02. HEATING COIL = KANTHAL A1 GARDE
- 03. COIL OD = 33 MM
- 04. WIRE DIA = 4.8 MM
- 05. BOBIN
- 06. THERMINAL ROD



MATERIAL = APM / A1
QTY :- 6 NO'S
POWER : 6 X 7 = 42 KW
ONE FURNACE
QTY :- 6 + 6 = 12 NO'S
TWO FURNACE
QTY :- 4 NO'S
SPARE

NOTE:
DESIGN & DIMENSIONS ARE SUBJECT TO
CHANGE DUE TO TECHNOLOGICAL IMPROVEMENT

STAR CONNECTION



CLIENT		DRAWING NO.		REV.	
BHEL - TRICHY		014-01-03		00	
TITLE		SCALE		TOTAL WT. Kg.	
HEATING HELEMENT DETAIL		N.T.S		-	
NAME		SHEET No.		No. OF SHEETS	
JIN		1		3	
SIGN		SV		3	
DRN		APPD		DATE	
JIN		SV		07.10.2017	



Item No.30

CERAMIC TUBE L800xDia22xT3

Quantity: 24 Nos

<Item Text>

Ceramic Tube (Item no II in Drg No: DRG: BHEL: U2: 007)

Application: Heating element support in M/s Vibrant make high temperature flux baking oven

Maximum working temperature of the oven: 1100 degree Celsius

Length of the tube: 800mm

Outer diameter of the tube: 22mm

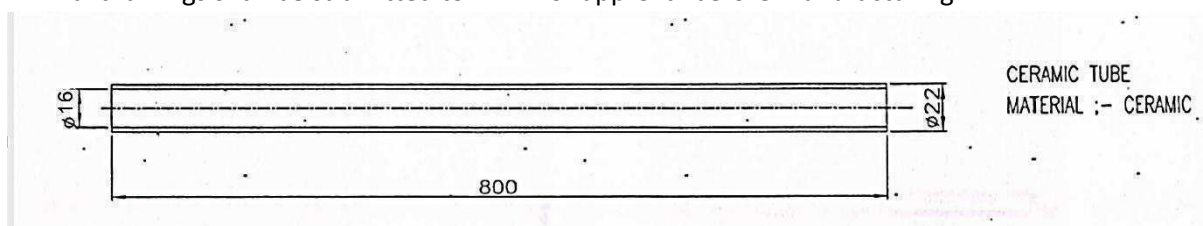
Inner diameter of the tube: 16mm

Thickness of the tube: 3mm

<Item Note>

Note:

1. The drawing (Item no II in Drg No: DRG: BHEL: U2:007) of the ceramic tube is attached for reference.
2. As per the attached drawing, the wall thickness of the tube is only 2mm. But the wall thickness of the tube should be ENHANCED to 3mm, keeping the outer diameter 22mm. So the tube should be produced with a wall thickness of 3mm, but keeping the outer diameter and the length of the tube as same as the attached drawing.
3. Vendor may visit BHEL works to inspect the furnace before quoting for the same.
4. Final drawings shall be submitted to BHEL for approval before manufacturing.





Item No.40

CERAMIC COLLAR TUBE FOR TERMINAL STUD

Quantity: 12 Nos

<Item Text>

Ceramic Collar Tube for Terminal Rod of Oven

Refer: Item no III of Drg No: DRG: BHEL: U2: 007

Application: Heating element support in M/s Vibrant make high temperature flux baking oven

Maximum working temperature of the oven: 1100 degree Celsius

Total Length of the tube: 170mm

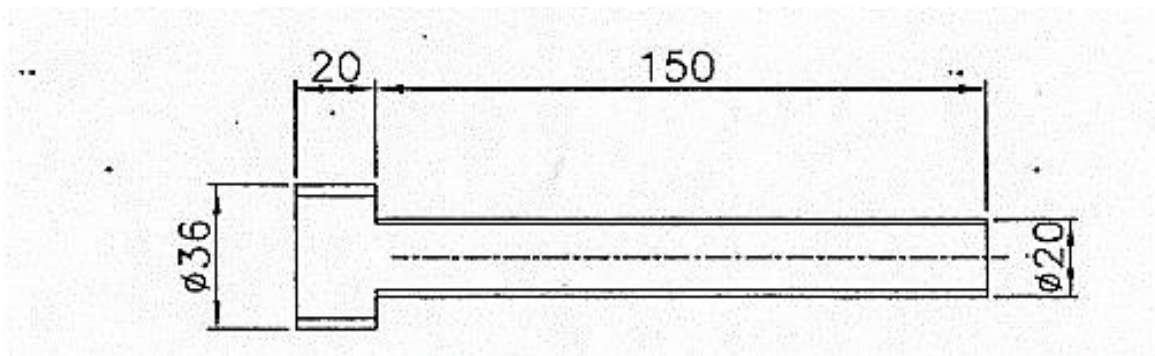
Dimension of the tube: Single piece construction of L 20mm x OD 36mm + L 150mm x OD 20mm

Wall thickness: 3mm

<Item Note>

Note:

1. The drawing (Item no III in Drg No: DRG: BHEL: U2:007) of the ceramic tube is attached for reference.
2. Vendor may visit BHEL works to inspect the furnace before quoting for the same.
3. Final drawings shall be submitted to BHEL for approval before manufacturing





Item No.50

SS310 TERMINAL ROD 12MM DIA

Quantity: 24 Nos

<Item Text>

Stainless Steel Terminal Rod for High temperature Oven

Refer: Drg No: DRG: BHEL: U2: 008

Application: Stainless Steel Terminal Rod for M/s Vibrant make High temperature flux baking oven.

Maximum working temperature of the oven: 1100 degree Celsius

Material of the terminal rod: SS310

Diameter of the rod: 12mm

Total length of the rod: 395mm

Description of construction:

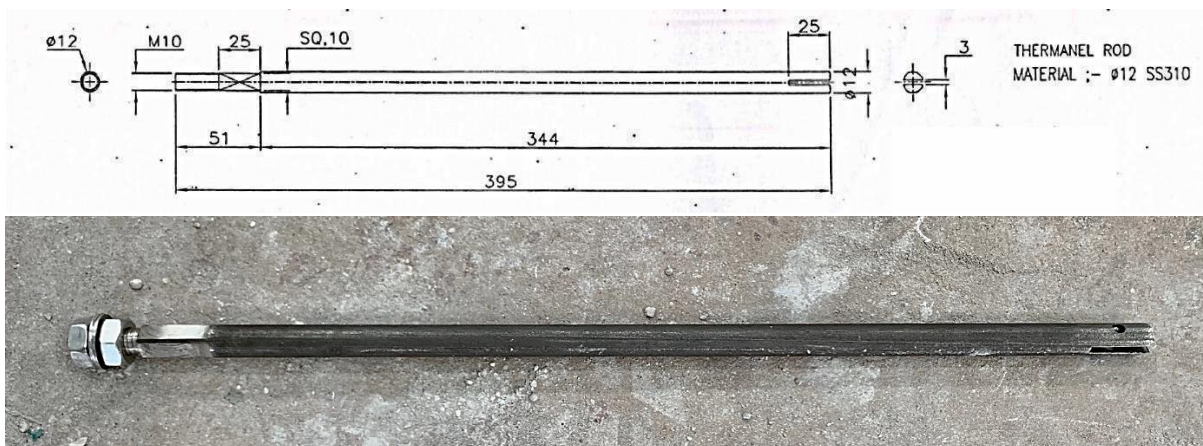
Element connecting end of the rod: A Slot of 3mm width and 25mm depth should be cut at this end. And a through hole of dia 5.5mm shall be made at the center of the slotted portion, in perpendicular to the slot, passing through the slot. This is for inserting the end of the element wire through the through hole and to weld fill the slot for attaching the element to the rod.

From the slotted end, the first 344mm is of Dia 12mm, then it reduces to a squared cross section portion of 10mm x 10mm cross section for next 25mm of length and then it changes to a threaded portion of Dia 10mm for balance of 26mm of length for electrical connection termination.

<Item Note>

Note:

1. The drawing (Item no II in Drg No: DRG: BHEL: U2:008) of the terminal rod is attached for reference.
2. Vendor may visit BHEL works to inspect the furnace before quoting for the same.
3. Final drawings shall be submitted to BHEL for approval before manufacturing





Item No.60

U-TUBE EMBEDDED HEATING ELEMENT 1.67kW

Quantity: 12 Nos

<Item Text>

heating element for immersion water heater assembly

Refer Item 01 Of Drg No: 3-M-19B06-16114

Power rating of heating element: 1.67kw

Rated voltage: 230V AC, 50Hz

Resistance of the element: 32 ohm

Operating temperature: 100 degrees Celsius

Max temperature: 120 degrees Celsius

Element construction: as per attached drawing

Length of the heater: 1860mm

Form Factor: U-shaped with short bending radius

Construction: The ceramic insulated heating element is embedded in a U-Shaped metallic tube of diameter 8 mm with bending radius as per the drawing. The electrical termination is made at the ends of the two parallel arms of the U-Tube using stud bolts M4 size. The two ends of the heating element embedded U-tube is inserted and through two holes provided in the face of a threaded brass cylindrical block, and welded together with the whole heating element portion on the one side and the electrical connection terminals on the other side.

Mounting: The heating element is mounted to the machine by the threaded on the brass cylinder outer periphery.

Details of the heater assembly:

Heater specification: 5kw immersion water heater, 5kw 3phase-star connection

Total No of Elements: 3

Make: Kantilal Chunilal & Sons Appliances Pvt Ltd, Surat

Model: Spherehot FHIMM 062

<Item Note>

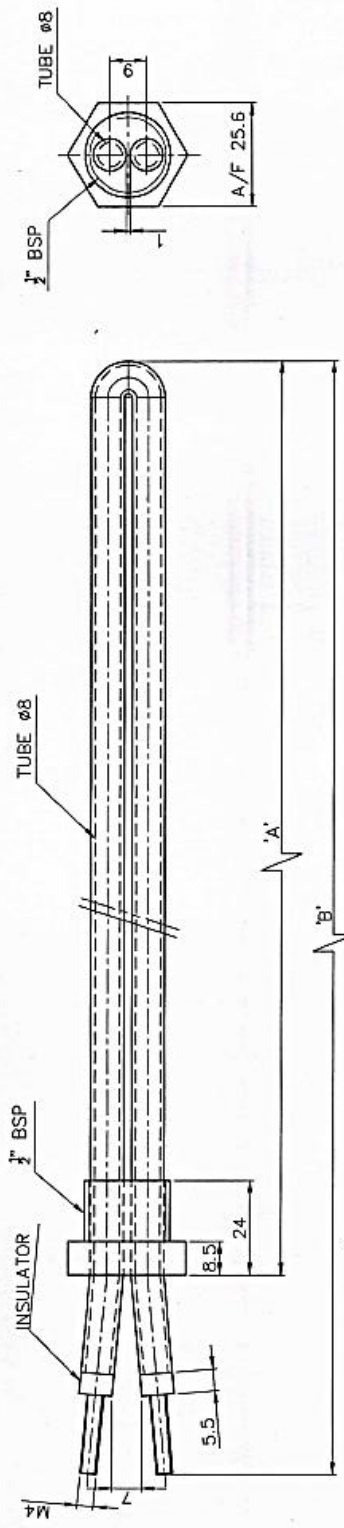
Note:

1. The detailed drawing (Item 01 of Drg no: 3-M-19B06-16114) of the item is attached for reference.
2. The deviation of the resistance of the heating element is limited to less than -3% to +0% of the stated value. The connection of the coils in the machine is in star with ungrounded neutral, which requires balanced load in each phase. So the resistance difference between all the supplied coils of same type should be within 2%, considering the practical constraints in manufacturing.
3. Vendor may visit BHEL works to inspect the furnace before quoting for the same.
4. Final drawings shall be submitted to BHEL for approval before manufacturing



ALL DIMENSIONS ARE IN MILLIMETRES

DRAWING NO: 3-M-19B06-16114



ITEM	POWER	OHMS	'A'	'B'	THREAD SIZE	TUBE LENGTH	TUBE Ø	A/F
01	1.67 KW	320	905	955	1/2" BSP	1860	Ø8	25.6
02	3.33 KW	160	1300	1350	1/2" BSP	2650	Ø8	25.6

ITEM 70
ITEM 80

NOTE: -
Ø1. TUBE OUTSIDE NICKEL PLATED
APPLICATION:
WATER HEATING UPTD 100° C.

ITEM NO	DESCRIPTION	DRAWING NO	MAIL CODE	UNIT WT
EQUIP: FLUSHING STATION - SECONDARY SIDE / FS - ENCG				
Bharat Heavy Electricals Ltd HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014				
NAME	C. PRINDESHY	DATE	07/11/19	SIGNATURE
DESIGN	A. ANNASEKAR	DATE	08/11/19	SIGNATURE
APPD	A. ANNASEKAR	DATE	08/11/19	SIGNATURE
DPT	REF TO ASST ENG NO	WEIGHT (Kg)		ITEM
SCALE	1:1	REF TO OLD DWG NO		
REV	DATE	ZONE		
ALTERNATIVE APPROVED				
TITLE		DRAWING NO : 3-M-19B06-16114 00		
HEATING ELEMENTS (SECONDARY SIDE)		REV		
		U 01		
		A3-SIZE		

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Item No.70

U-TUBE EMBEDDED HEATING ELEMENT 3.33kW

Quantity: 6 Nos

<Item Text>

Heating element for immersion water heater assembly

Refer Item 02 of Drg no: 3-M-19B06-16114

Power Rating of Heating Element: 3.33kW

Rated Voltage: 230V AC, 50Hz

Resistance of the Element: 16 OHM

Operating Temperature: 100 degrees Celsius

Max Temperature: 120 degrees Celsius

Element construction: as per attached drawing

Length of the heater: 2650mm

Form Factor: U-shaped with short bending radius

Construction: The ceramic insulated heating element is embedded in a U-Shaped metallic tube of diameter 8 mm with bending radius as per drawing. The electrical termination is made at the ends of the two parallel arms of the U-Tube using stud bolts of size M4. The two ends of the heating element embedded U-tube is inserted and through two holes provided in the face of a threaded brass cylindrical block, and welded together with the whole heating element portion on the one side and the electrical connection terminals on the other side.

Mounting: The heating element is mounted to the machine by the threaded on the brass cylinder outer periphery.

Details of the heater assembly:

Heater specification: 20kw immersion water heater, 2 x 10kw 3phase-star connection

Total no of elements: 6

Make: Kantilal Chunilal & Sons Appliances Pvt Ltd, Surat

<Item Note>

Note:

1. The detailed drawing (Item 02 of Drg no: 3-M-19B06-16114) of the item is attached for reference.
2. The deviation of the resistance of the heating element is limited to less than -3% to +0% of the stated value. the connection of the coils in the machine is in star with ungrounded neutral, which requires balanced load in each phase. so the resistance difference between all the supplied coils of same type should be within 2%, considering the practical constraints in manufacturing.
3. Vendor may visit BHEL works to inspect the furnace before quoting for the same.
4. Final drawings shall be submitted to BHEL for approval before



Item No.80

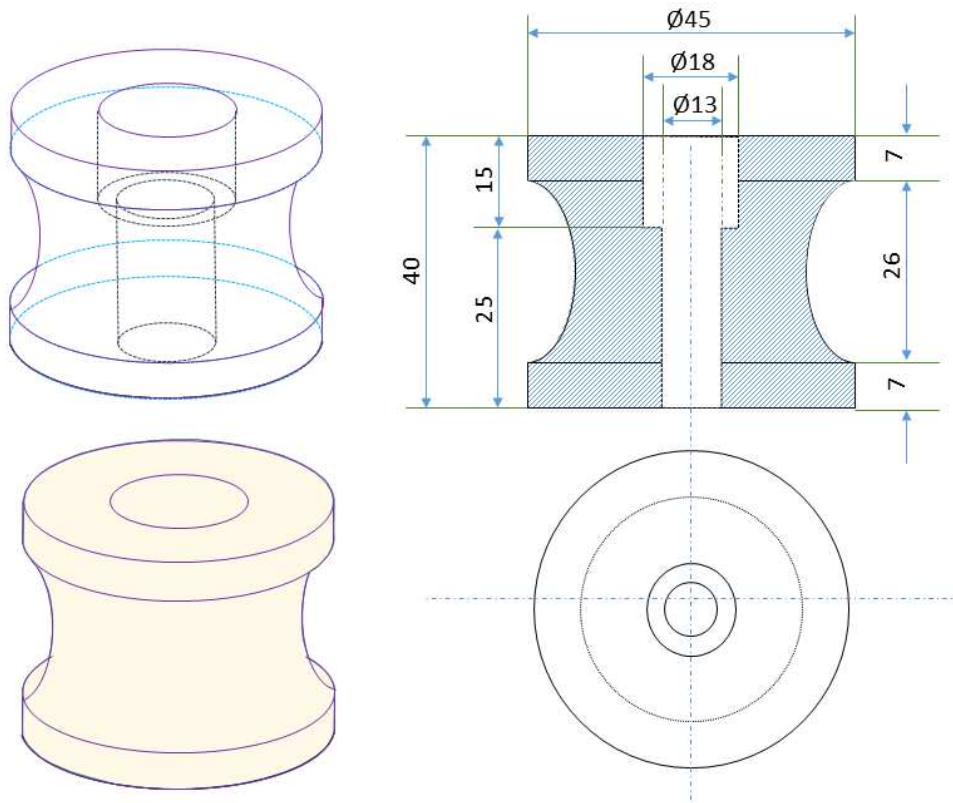
Item: Ceramic bobbin

Purpose: Support for heating element

Working temperature of the furnace: 1100 deg. C.

Furnace details: Vibrant make high temperature flux baking furnace

Quantity: 100 Nos





Annexure B

Pre-Qualification Criteria & Vendor's Details

A. Pre-Qualification Criteria		
SL. No	Pre-Qualification Criteria	Vendor's Confirmation /Acceptance
	The BIDDER / VENDOR have to compulsorily meet all the following requirements to get qualified for consideration of the technical offer. If the vendor does not qualify as per PRE-QUALIFICATION CRITERIA, the technical offer of such BIDDER(s) / VENDOR(s) offer will not be evaluated.	
1.	The bidder should have supplied electrical heating elements/coils to any PSU/Government/Semi Government Organization/Joint Venture company of PSUS or Govt. Organization or both/Private sector company registered under Companies Act 1956, in last three (03) years (on the date of opening of tender).	
2.	Copies of Purchase Order(s) is required to be submitted in support of above along with Contact details of the customer.	
3.	Along with the Technical offer, the Vendor should submit one Performance certificate from the customer for the satisfactory performance of the heating elements supplied to them.	
4.	The bidder shall confirm to 1-year warranty for all the items from the date of material receipt.	
B. Supplier/Vendor details		
1	Supplier Name & Address	
2	Contact Person Name, email id and Mobile Number	
3	HSN code for the quoted items	
4	GST% included in the quoted price	

Vendor Signature & Seal