iNVENTUM

ENGINEERS FOR INNOVATIONS

INDUCTION HEATER

SERIES - HIB

for Mounting Shrink-fit Bearings by Induction Heating

PI - 162

A Company Overview

Established in 1988, Inventum is a pioneer in the field of development of Bearing Induction Heaters with microprocessor controls and Hydraulic Bearing Extractors in India. It specialises in the design and manufacture of high quality equipment and tools used for efficient handling, mounting and dismounting of shrink-fit machine elements like Bearings, Pinions, Gears, Couplings and other transmission components.

Among its many past achievements, Inventum successfully executed a World Bank financed order for the Indian Railways. In addition, it has a wide coverage of customers in the fast growing Industrial sector of the country.

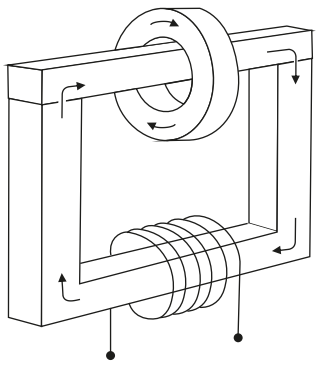
Today, several hundred Inventum Induction Heaters of the HIB - Series are working to the complete satisfaction of a variety of clients from major industries and in Railway Workshops all over India. Inventum customers have always enjoyed excellent after sales service and support unparalleled in the field.

Induction Heaters - a technical edge

In the Engineering Industry, when the Bearing or other Torque Transmitting Steel Components like gears, pinions, couplings, pulleys, fly-wheels, sleeves, labyrinth rings and liners are required to be mounted on the shafts, the logical approach to shrink fitting recommended is by the process of Induction Heating. This practice of mounting bearings or steel components by shrink fitting optimises its service life.

What is induction heating ?

For mounting Bearings, Induction Heating is a fast, controllable, reliable and a safer heating process as compared to the other conventional methods of hammering, oil bath or hydraulically pressing the Bearing on the shafts.



Induction heaters produce strong alternating magnetic fields that induce eddy currents in metals. These currents cause rapid and efficient heating of the bearings or components. As a result, the bearing expands and can be mounted on the shaft easily and safely. Morever the low voltage inside the bearing or components eliminates any hazard due to shocks or sparks.

Why induction heating ?

Induction Heating offers innumerable advantages and improves life expectancy of machinery/ equipment. Some of the advantages are:

Increased life expectancy of Bearing and consequently of the equipment.

Convenient 'on-site' mounting - easy and efficient.

Safe process avoiding dangers of accidents due to hot parts / open heating.

Economy in mounting process - no disposal formalities required for smoke, vapours and used oil produced during conventional process of heating.

No loss of pre-lubrication of Bearings.

Ready to use - Just switch on and heat. No set up time required.

Why Inventum Induction Heaters?

- Robust industrial design
- Compact and portable
- Ensures Bearing safety. Suits all types of Bearings
- Cover wide range of Bearings from bore size 15 mm and above
- Microprocessor controls
- User-oriented, easily readable functions and displays
- Environmentally sound
- Fault finding, self diagnostic function.
- Auto restart - temperature hold function.
- Auto demagnetisation.
- Ideal for Industrial use - Maintenance and Production.
- FAST - EASY - RELIABLE - SAFE.

Inventum HIB Series Induction Heaters

Inventum HIB Series Induction Heaters are available in 4 basic models to cover the widest range of bearings and other components from bore size 15mm and above, viz.

HIB-01, HIB-02, HIB-03 and HIB-04

Keeping in view the special requirements of industrial applications, variants of these models with higher power capacity and special features can be supplied as per requirment.

In all HIB Models the two operating modes , viz. Temperature mode and Time mode, are controlled through electronic circuits by separate controls and the heating cycle stops when the selected mode reaches its set value. In both modes the demagnetizing cycle follows automatically and its completion is indicated by an audio-visual alarm. More than one component can be placed side by side around the horizontal yoke and heated at the same time. Also, components can be placed in vertical as well as horizontal position for heating.

In temperature mode heating temperature can be set to the required level by adjusting temperature controls. A temperature probe monitors the temperature of the bearing. When pre-set temperature is reached the heating cycle stops and the demagnetizing cycle starts. In time mode Heating time can be set by adjusting Time controls. As pre-set time is reached, the heating cycle stops and the demagnetizing cycle starts.

Special Swivelling arrangement: Designated by suffix '-S'

Special Ring gear Holding & Roll-sliding arrangement: Designated by suffix '-RSH'

Model HIB-01 : Heating time chart for rolling bearings (to 100° C approx.)

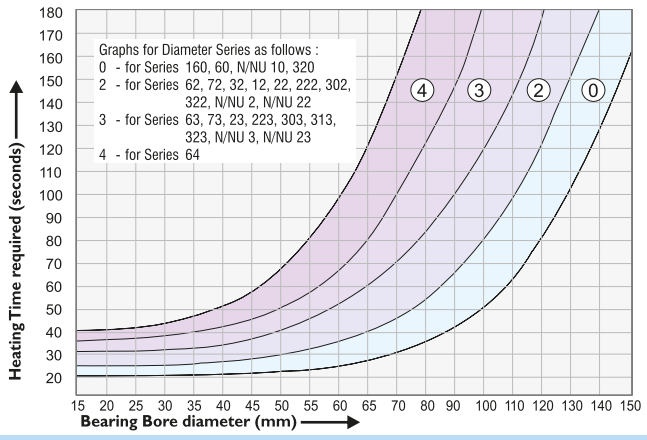


Chart is only indicative

Model HIB-02: Heating cycle time of typical bearings (using 100% power)

Bearing	Weight	40° C		60° C		80° C		100° C		110° C	
	kg	min	sec	min	sec	min	sec	min	sec	min	sec
24028	8.45	0	15	0	45	1	20	2	00	2	20
24036	23.00	0	20	1	05	2	20	4	15	5	05
24044	39.50	1	00	2	45	5	15	8	10	9	30
24052	64.50	1	05	5	00	10	15	16	30	19	20
6212	0.80	0	10	0	15	0	20	0	25	0	30
6220	3.15	0	10	0	20	0	30	0	40	0	45
6230	9.40	0	20	0	50	1	25	2	00	2	15
6240	28.00	1	20	3	55	6	00	8	00	9	30

Chart is only indicative

Model HIB-01

This 'light-weight' member of Series HIB, has a power capacity of 3.3 kVA. The controls are based on solid state electronics.

Features

Temperature and time modes are in series, and set through separate knobs. This model suits small to medium sized components. It can also be used to heat bearings of larger diameter. For this purpose, Riser Blocks (size 55 x 60 x 120 mm) are to be used.

Model HIB-01-S is a special version of this model, designed with a Swivelling arrangement for the yoke.

Standard Accessories

• Main equipment - Induction Heater	
• Horizontal yokes 20 x 20 x 250mm, 30 x 30 x 250mm, 45 x 45 x 250mm	1 No. each
• Temperature Probe arrangement with cable & socket	1 No.
• Hand gloves to handle heated bearings	1 Pair

List of Optional Accessories is given on the last page

Model HIB-02

This 'Middle-weight' from Series HIB, has a power capacity of 6 kVA. Its controls are microprocessor based. It weighs about 47 kg. and can be carried to the site of operation, using special die-cast handles provided on both sides. It can heat typical bearings of 13 kg. and 64 kg. to 110^{0} C in 3 minutes and 20 minutes, respectively.

Features

It suits medium to large sized components. Attached to the main body of the Induction Heater, there is a separate handheld HIB Control Box. This HIB Control Box is connected by a 2 metre long cable to the unit and hence the unit can be operated from a convenient location. All the process parameters viz. time, temperature, power, mode etc. can be precisely set and controlled by using the HIB Control Box. This provides the controls at your finger tips.

Standard Accessories

• Main equipment - Induction Heater	
• HIB Control Box	1 No.
• Horizontal yoke size 65 x 65 x 340 mm	1 No.
• Temperature Probe arrangement with cable & socket	1 No.
• Hand gloves to handle heated bearings	1 Pair

List of Optional Accessories is given on the last page

Model HIB-03

This 'heavy-weight' of Series HIB, has a power capacity of 11kVA. It has the same controls as that of HIB-02, which are microprocessor based. It weighs about 87 kg. and is recommended to be placed on a Special Equipment Trolley for easy mobility. It can heat typical bearings of 40 kg. and 52 kgs. to 110^{0}C in about 4 minutes and 8 minutes, respectively.

Features

The equipment is a larger version of HIB-02 and has identical features and advantages. Model HIB-03 is also provided with a Special Roll-sliding Arrangement for the standard yoke 80 x 80 x 490 mm. This arrangement is so designed that the yoke gets lifted mechanically and rolls off from the vertical supports, without rubbing or damaging the ground and scraped mating surfaces. It provides additional safety, ease of operation and improves productivity.

Standard Accessories

- Main equipment - Induction Heater
- HIB Control Box 1No.
- Horizontal yoke size 80 x 80 x 490 mm with Special Roll-sliding Arrangement 1No.
- Temperature Probe arrangement with cable & socket 1No.
- Hand gloves to handle heated bearings 1Pair

List of Optional Accessories is given on the last page

Model HIB-04

This 'Jumbo-size' Induction Heater Model 'HIB-04' has awesome power (22-25 kVA) to heat very heavy and large size components.

Features

The controls are microprocessor based and are operated through a revolving control box mounted on the main unit for convenience. The heavier and bulkier Bearings/ components can be placed in horizontal as well as vertical position for heating on this model. The special Roll-sliding Arrangement is provided for the standard yoke size 100 x100 x 600 mm. It is similar to that of HIB-03.

Standard Accessories

- Main equipment - Induction Heater
- Revolving type LCD/ LED Display Box connected to unit 1No.
- Horizontal Yoke size 100 x100 x 600 mm with Special Roll- sliding Arrangement 1No.
- Temperature probe arrangement with cable & socket. (magnetic) 1No.
- Hand gloves. 1Pair
- Handheld Digital Thermometer (0-500^{0}C) with probe DT-01. 1No.
- Spare Temperature probe with cable & socket. (magnetic) 1No.
- Manually operated Hydraulic Pallet Trolley 1No.

List of Optional Accessories is given on the last page

The High Power, Fast Acting Model HIB-05 (40kvA unit) is now available on demand.




Product Data	HIB-01	HIB-02	HIB-03	HIB-04
• Heater Body	Outer casing body of these units is made from Impact Resistant FRP, and coated with special heat and scratch resistant PU hard coating.			Robust all Steel body.
• Power* (maximum)	3.3 kVA	6 kVA	11kVA	22-25kVA
	*Depends on workpiece / bearing geometry, composition and supply conditions.			
• Voltage	10x230 V	20x440 V	20x440 V	20x440 V
• Nominal Current	15 A	16 A	28 A	60 A
• Residual Magnetism	< 2 A/cm	< 2 A/cm	< 2 A/cm	< 2 A/cm
• Power Level	High 100% Low 50%	Variable in steps of 25%, 50% 75% and 100% Power		
• Temperature Control	60°C to 120°C using solid-state circuit	50°C to 250°C using microprocessor based circuit, adjustable in steps of 1°C.		
	(Temperature accuracy: +/- 5°C for all models)			
• Time Control	0.5 to 6.0 minutes continuous	0 to 99 minutes, adjustable in steps of 0.1 minute		
• Space between vertical supports (WxH) (*variable)	100 x 100 mm	190 x 130mm	310 x 185 mm	350 x 450 mm*
• Overall dimensions (WxDxH)	320x265x240 mm	450x285x300mm	610x320x410 mm	770x430x1100 mm
• Weight (Main unit only)	26 Kg.	47 Kg.	87 Kg.	246 Kg.
• Weight with Standard Yokes	33 Kg.	60 Kg.	112 Kg.	288 Kg.
• Standard Horizontal Yoke sizes (suitable for component bore sizes)	20 x 20 x 250 mm (for 29 mm & above)	65 x 65 x 340 mm (for 92 mm & above)	80 x 80 x 490 mm (for 114 mm & above)	100x100x600 mm (for 140 mm & above)
	30 x 30 x 250 mm (for 43 mm & above)			
	45 x 45 x 250 mm (for 64 mm & above)			
Optional Accessories:				
• Horizontal Yoke sizes (suitable for component bore sizes)	10 x 10 x 250 mm (for15 mm & above)	20 x 20 x 340 mm (for 29 mm & above)	40 x 40 x 490 mm (for 57 mm & above)	80 x 80 x 600 mm (for 114 mm & above)
	14 x 14 x 250 mm (for 20 mm & above)	40 x 40 x 340 mm (for 57 mm & above)	50 x 50 x 490 mm (for 71 mm & above)	65 x 65 x 600 mm (for 92 mm & above)
	55 x 55 x 250 mm (for 78 mm & above)	50 x 50 x 340 mm (for 71 mm & above)	65 x 65 x 490 mm (for 92 mm & above)	
• Riser Blocks (Pair)	55 x 60 x 120mm	.....	.....	.....
• Special Equipment Trolley	690x530x355mm	690x530x355mm	690x530x355mm	.....
• Handheld Digital Thermometer	DT-01(0 to 500°C)	DT-01(0 to 500°C)	DT-01(0 to 500°C)	DT-01(0 to 500°C)
• Model Variants with Power Capacity available	3 - 4 kVA	6 - 8 kVA	10 - 14kVA	20 - 25 kVA

Custom built induction Heaters with special features can also be supplied on demand.
Special models are designated with suffix / prefix such as : S, RS, RSH, SPL, RM, P, RL, etc.

Bearings are normally heated up to temperature 120°C max. as recommended by leading bearing manufacturers.
Other components can be heated up to higher temperature as per users requirment.

INVENTUM Induction Heating Equipment :
Every care has been taken to ensure the correctness of the information contained in this publication, but no liability can be accepted for any errors or omissions.

We reserve the right to make changes in the interest of technical progress

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