

USER MANUAL
INDUCTION HEATER IHN800

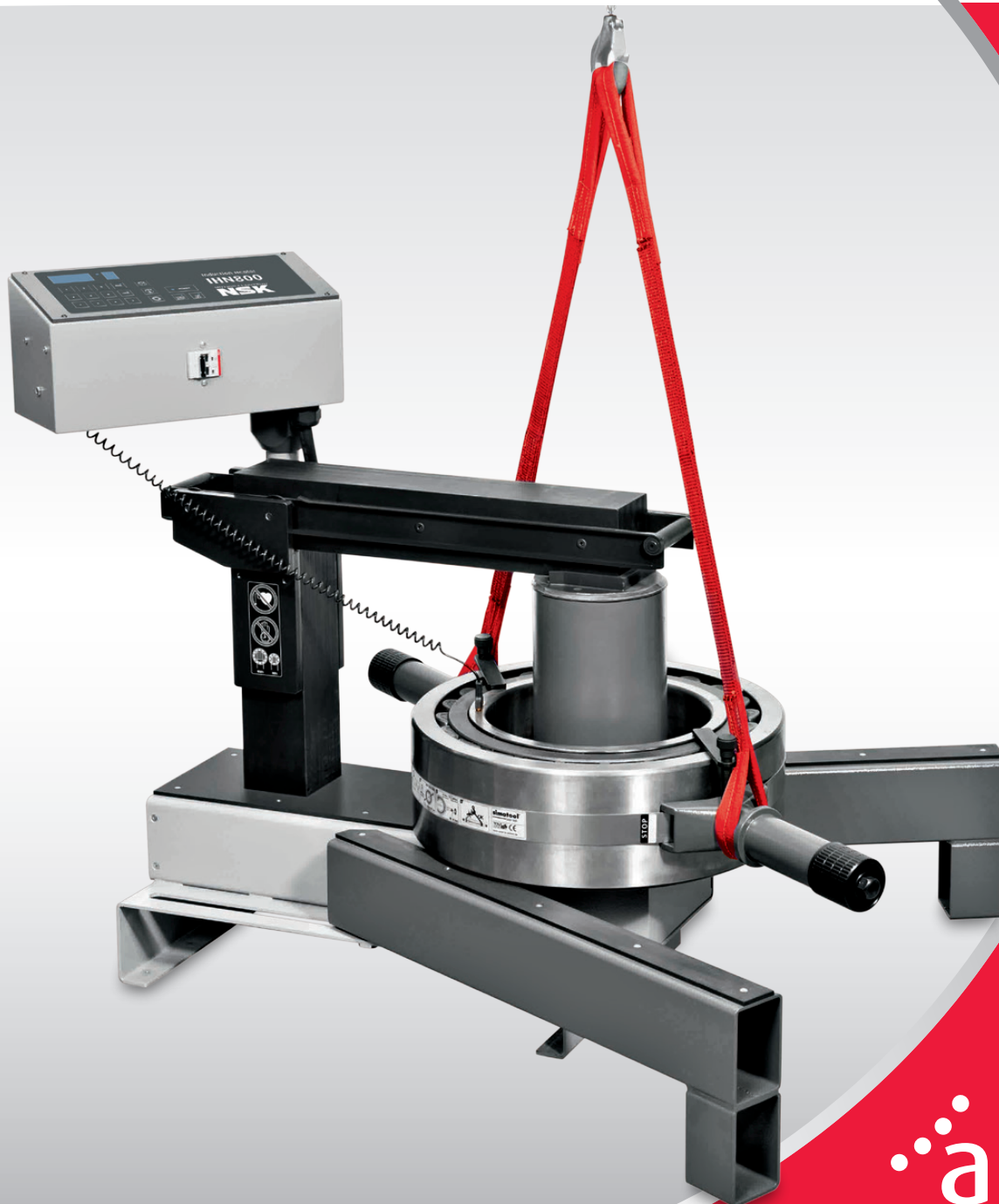


Table of Contents

Chapter.....	Page
Safety Recommendations.....	3
1 Introduction.....	3
1.1 Intended Use.....	3
1.2 Principle of Operation.....	4
2 Description.....	4
2.1 Components.....	4
2.2 Technical Data.....	5
3 Installation of Mains Plug.....	5
4 Preparation for Use.....	6
5 Operation.....	7
5.1 Function of Displays.....	7
5.2 Function of Buttons.....	7
5.3 Temp Mode.....	8
5.4 Time Mode.....	8
5.5 Temperature Measurement.....	9
5.6 Change of Temperature Unit.....	9
5.7 Demagnetisation.....	9
5.8 Power Level Selection.....	9
6 Safety Features.....	10
7 Troubleshooting.....	10
8 Spare Parts.....	11

Safety Recommendations

- › Because the IHN800 generates a magnetic field, people wearing a pacemaker must not be within 5 m (16 ft) of the IHN800 during operation. Electronic equipment, such as wrist watches, may also be affected.
- › Follow the operating instructions at all times.
- › Be certain that the voltage supply is correct.
- › Electrical arcing may occur when a potential difference exists between the IHN800 and the workpiece. This is not dangerous to human beings and will not cause damage to the IHN800 or the workpiece. However, the IHN800 must never be used in areas where there is a risk of explosion.
- › Do not expose the heater to high humidity.
- › Never operate the IHN800 without a yoke in position.
- › Do not modify the IHN800.
- › Use proper handling equipment when lifting heavy workpieces.
- › Avoid contact with hot workpieces. Wear the supplied heat resistant gloves to handle hot workpieces.

1 Introduction

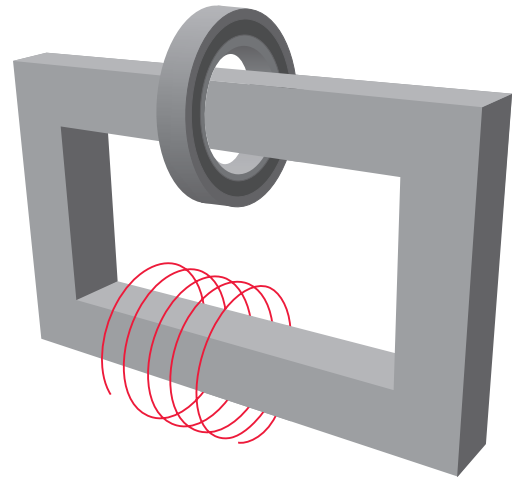
The IHN800 induction heater is designed to heat bearings that are mounted with an interference fit onto a shaft. The heat causes the bearing to expand, which eliminates the need to use force during installation. A 90°C (194°F) temperature difference between the bearing and shaft is generally sufficient to enable installation. At an ambient temperature of 20°C (68°F), the bearing must therefore be heated to 110°C (230°F).

1.1 Intended Use

The IHN800 has been designed to heat rolling bearings. However, other metal workpieces that form a closed circuit can also be heated. Examples of acceptable workpieces include bushings, shrink rings, pulleys, and gears. All bearings that fit over the inductive coil and between the vertical supports with the sliding yoke in place can be heated using the IHN800. In addition, smaller bearings can be placed over the sliding yoke. See the illustration at the beginning of this manual for example.

1.2 Principle of Operation

The IHN800 generates heat by means of a large electrical current that is magnetically induced in the workpiece by a coil within the heater. The high voltage, low current electricity flowing through the large number of windings in the inductive coil induces low voltage, high current electricity in the workpiece. Because the workpiece has the electrical characteristics of a coil with a single, short-circuited winding, the high current generates heat within the workpiece. Because the heat is generated within the workpiece, all of the heater components remain cool.



2 Description

The heating cycle is electronically controlled either in a TIME MODE, where the heating time is selected, or in a TEMP MODE where the desired temperature is selected.

The heater can further be run on 50% capacity when small yokes are used or when there is a risk for too quick heating of sensitive workpieces (e.g. bearings with C1 or C2 clearance).

2.1 Components

The induction heater consists of an U-shaped iron core with a large induction coil on one of its legs. The control electronics sits in a separate control box on top of the heater.

The temperature is controlled by means of a magnetic probe.

2.2 Technical Data

IHN800	
Voltage ($\pm 9\%$):	3 ~ 400 – 575V / 50 – 60Hz*
Recommended circuit protection	63A circuit breaker
Power consumption (maximum)	24kVA
Temperature control	0 – 250°C (32 – 482°F) in steps of 1°C (2°F)
Probe maximum temperature	250°C (482°F)
Time mode	0 – 60 minutes in steps of 0.1 minute
Power range	50 – 100%
Demagnetisation, automatic	Residual magnetism < 2A/cm
Overall dimensions	750 x 400 x 935mm
Area between supports (wxh)	330 x 355mm
Coil diameter	186mm
Weight (with yokes)	300kg
Workpiece maximum weight	1200kg
Maximum heating temperature	Approx. 400°C (752°F)
Standard yoke dimensions	100 x 100 x 570mm (for \varnothing of 142mm)

* Each bearing heater family has several voltage options. Please refer to the type plate on the heater body to determine the actual operating voltage.

3 Installation of Mains Plug

Due to the many types of mains plugs, no mains plug is supplied with the IHN800. A qualified electrician must install a suitable mains plug. The correct supply voltage is shown on the type plate / underside of the heater.

The wires should be connected as follows:

Color of IHN800 Wire	Mains Supply Terminal
Yellow/green	Protection earth (PE)
Brown	Phase 1 (L1)
Blue	Phase 2 (L2)

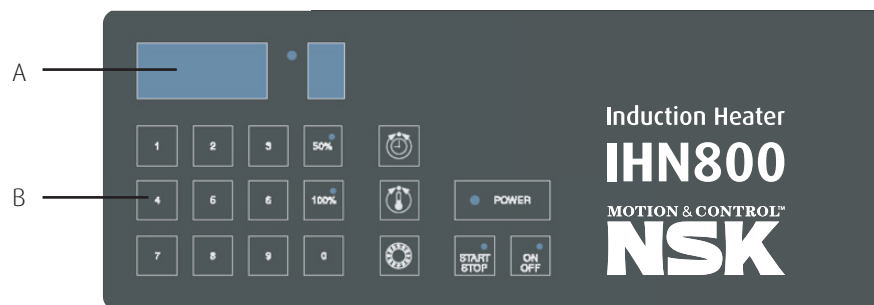
Connect the IHN800 to only two of the three phases. Verify that the correct circuit breaker is installed. See section 2.2 for circuit breaker specifications.

4 Preparation for Use

- › Place the IHN800 in the horizontal position on a stable surface.
- › Connect the mains plug to a suitable mains supply.
- › For workpieces with an internal diameter (>186mm) large enough to fit over the inductive coil, follow these steps:
 - › Place the workpiece over the inductive coil using appropriate lifting equipment.
 - › For best performance, adjust the position of the workpiece so that the inductive coil is in the centre.
 - › Remove the protective film from the bright underside of the sliding yoke before the first use.
 - › Slide the sliding yoke to the right so that it completely covers the top of both vertical supports.
- › For workpieces that do not fit over the inductive coil, these should be heated on the horizontal yoke.
- › If you will use TEMP MODE, plug the temperature probe into the connector on the left side of the heater.
Place the magnetic end of the probe on the inner ring of the bearing or on the innermost surface of the workpiece.
- › Switch the IHN800 on using the power switch on the left side.

5 Operation

5.1 Function of Displays



A) The main display shows the selected time or temperature for heating:

Display	Indication
t	Time in minutes
°C	Temperature in degrees Celsius
°F	Temperature in degrees Fahrenheit

5.2 Function of Buttons

B) The power display shows the selected power setting:

Button	Function
POWER	Control lamp for main switch on
TIME	TIME MODE
TEMP	TEMP MODE
BEARING	BEARING MODE – recommended heating temperature for bearings of 110°C (230°F) is automatically selected
START/STOP	To start and stop heating
ON/OFF	Press to start or stop the heater
50%	Power reduced to 50%
100%	Full capacity

5.3 Temp Mode

- › If the main display shows “t”, press MODE to select TEMP MODE. The main display shows °C or °F in TEMP MODE.
- › The selected temperature is shown on the main display. The default temperature for bearings is 110°C (230°F). If a different temperature is desired, adjust the temperature on the main display.
- › It may be desirable to heat bearings to temperatures above 110°C (230°F) for increased mounting time. Consult the bearing specifications to determine the maximum permitted temperature. Always ensure the bearing does not lock due to an excessive expansion of the inner ring compared to outer ring. See section 5.8.
- › All Spherical Roller Bearings (SRBs) are subjected to a special heat treatment. These bearings can be operated at temperatures as high as 200°C (392°F). Heating these bearings above 110°C (230°F) will not cause any damage as long as the bearing is still able to rotate. For other bearings, a temperature of 125°C (257°F) must not be exceeded unless otherwise specified.
- › Press the 50% key to reduce the POWER to 50%. Use the guidelines in section 5.8 to determine the correct power setting.
- › Press START/STOP to start the heater. The main display shows the current temperature of the workpiece.
- › When the selected temperature has been reached, the heater demagnetises the workpiece, switches off, and generates an acoustic signal for 10 seconds or until START/STOP is pressed.
- › Press START/STOP to stop the heater.
- › Remove the workpiece with proper handling equipment.
- › If the workpiece remains on the heater, the heater will start again when the temperature of the workpiece drops 10°C (18°F). Press START/STOP to stop the heater and demagnetise the workpiece.
- › The IHN800 is now ready to heat another workpiece with the same settings.

5.4 Time Mode

- › Select TIME MODE. The main display shows “t” in TIME MODE.
- › Set desired heating time by adjusting on the main display.
- › Press 50% to reduce the POWER to 50%. Use the guidelines in section 5.8 to determine the correct power setting.
- › Press START/STOP to start the heater. The main display shows the time that remains.

- › When the time has elapsed, the heater demagnetises the workpiece, switches off, and generates an acoustic signal for 10 seconds.
- › Press START/STOP to cancel the acoustic signal and stop the heater.
- › Remove the workpiece with proper handling equipment.
- › The IHN800 is now ready to heat another workpiece with the same settings.

5.5 Temperature Measurement

When the heater is not operating, the temperature of the workpiece can be measured by pressing 0 and TEMP at the same time. The LED on the START/STOP button flashes during temperature measurement. Press START/STOP to cancel temperature measurement.

5.6 Change of Temperature Units

Press 0 and BEARING at the same time to switch between °C and °F. The temperature unit setting remains the same even after disconnection from mains power.

5.7 Demagnetisation

The workpiece is automatically demagnetised when heating is complete. Demagnetisation will not occur if the power is interrupted or the main switch is switched off. To use the IHN800 for demagnetisation only, select TIME MODE and set the time to 0.1 minute (6 seconds).

5.8 Power Level Selection

When heating bearings with an induction heater, most of the heat will be generated in the inner bearing race. The heat will then be transferred through the bearing. It is therefore important that bearings with small internal clearance or slight preload are heated slowly. Slow heating ensures that the bearing expands evenly, thereby preventing damage to the bearing.

The shape, weight, size and internal clearances all affect the amount of time required to heat a bearing. The large variety of bearing types precludes the possibility of providing a specific power level setting for each type. Instead, the following guidelines are provided:

- › For sensitive bearings (including bearings with C1 or C2 internal clearance) or bearings with brass cages and when using the small yoke, reduce the power to 50%.

6 Safety Features

The IHN800 is equipped with the following safety features:

- › Main switch with overcurrent circuit breaker.
- › Automatic overheating protection.
- › Automatic current control.
- › In the TEMP MODE the heater will switch off if the temperature probe does not register a temperature increase of 1°C (2°F) every 30 seconds. To increase the interval to 60 seconds, press MODE and DOWN at the same time.

7 Troubleshooting

A system fault will be indicated by an acoustic signal and one of the following fault codes on the main display:

Display	Fault	Action
E00 E	Electronic failure	Return heater for repair
E01 E	Electronic failure	Return heater for repair
E02 E	Electronic failure	Return heater for repair
E03 E	Overheated coil	Wait until the inductive coil cools
E04 E	Selected time/temperature out of range	Re-program
E05 E	Temperature increases of less than 1°C (2°F) every 30 seconds (or 1°C (2°F) every 60 seconds)	Check the temperature probe connection. If the connection is OK, select the 60 second interval as described in section 6 or operate the heater in TIME MODE.
E06 E	Temperature probe not connected (or defective)	Check the temperature probe
E07 E	Failure during current measurement	Return heater for repair

8 Spare Parts

Description	Part Number
Spare protective gloves	IHNGLOVES
Spare temperature probe for IHN800	IHNP1SENSOR
Spare yoke 65 x 65 x 570mm for IHN800	IHN800-Y1
Spare yoke 100 x 100 x 570mm for IHN800	IHN800-Y2
Spare support yoke 100 x 100 x 150mm for IHN800	IHN800-YS1
Spare support yoke 100 x 100 x 370mm for IHN800	IHN800-YS2

NSK SALES OFFICES WORLDWIDE

MOTION & CONTROL™
NSK

HEADQUARTER

Japan

NSK Ltd.-Headquarters
Nissei Bldg., 1-6-3 Ohsaki
Shinagawa-ku
Tokyo 141-8560

Industrial machinery business
Division-Headquarters
Tel. +81 (3) 3779 7227
Fax +81 (3) 3779 7644

Automotive business
Division-Headquarters
Tel. +81 (3) 3779 7189
Fax +81 (3) 3779 7917

AFRICA

South Africa

NSK South Africa (Pty) Ltd.
27 Galaxy Avenue
Linbro Business Park
Sandton 2146
Tel. +27 (011) 458 3600
Fax +27 (011) 458 3608
nsk-sa@nsk.com

ASIA AND OCEANIA

Australia

NSK Australia Pty. Ltd.
11 Dalmore Drive
Scoresby
Victoria 3179
Tel. +61 3 9765 4400
Fax +61 3 9764 8304
aus-nskenquiries@nsk.com

New Zealand

NSK New Zealand Ltd.
3 Te Apunga Place
Mt. Wellington
Auckland
Tel. +64 9 276 4992
Fax +64 9 276 4082
nz-info@nsk.com

China

NSK Hong Kong Ltd.
Suite 705, 7th Floor South Tower
World Finance Centre
Harbour City, T.S.T
Kowloon, Hong Kong
Tel. +852 2739 9933
Fax +852 2739 9323

NSK China Sales Co., Ltd.
No.8 NSK Rd., Huaqiao Economic
Development Zone, Kunshan
Jiangsu, China (215332)
Tel. +86 512 5796 3000
Fax +86 512 5796 3300

India

NSK in diasales Co.Pvt.Ltd.
6th Floor, Bannari Amman Towers
No.29 Dr. Radhakrishnan Salai
Mylapore, Chennai-600 004 Tamil Nadu
Tel. +91 44 2847 9600
Fax +91 44 2847 9601

Indonesia

Pt. NSK Indonesia
Summitmas II, 6th Floor
Jl. Jend Sudirman Kav. 61-62
Jakarta 12190
Tel. +62 21 252 3458
Fax +62 21 252 3223

Korea

NSK Korea Co., Ltd.
Posco Center (West Wing) 9F
892, Daechi-4Dong
Kangnam-Ku
Seoul, 135-777
Tel. +82 2 3287 0300
Fax +82 2 3287 0345

Malaysia

NSK Bearings (Malaysia) Sdn. Bhd.
No. 2, Jalan Pemaju, U1/15, Seksyen U1
Hicom Gienmarie Industrial Park
40150 Shah Alam
Selangor
Tel. +60 3 7803 8859
Fax +60 3 7806 5982

Philippines

NSK Representative Office
8th Floor The Salcedo Towers
169 H.V. dela Costa St.
Salcedo Village Makati City
Philippines 1227
Tel. +63 2 893 9543
Fax +63 2 893 9173

Taiwan

Taiwan NSK Precision Co., Ltd.
11 F., No.87, Song Jiang Rd.
Jhongsan District
Taipei City 104
Tel. +886 2 2509 3305
Fax +886 2 2509 1393

Thailand

NSK Bearings (Thailand) Co., Ltd.
26 Soi Onnuch 55/1 Pravet Subdistrict
Pravet District
Bangkok 10250
Tel. +66 2320 2555
Fax +66 2320 2826

Vietnam

NSK Vietnam Co., Ltd.
Techno Center, Room 204-205
Thang Lang Industrial Park
Dang Anh District
Hanoi
Tel. +84 4 3955 0159
Fax +84 4 3955 0158

EUROPE

UK

NSK UK Ltd.
Northern Road, Newark
Nottinghamshire NG24 2JF
Tel. +44 (0) 1636 605123
Fax +44 (0) 1636 643276
info-uk@nsk.com

France & Benelux

NSK France S.A.S.
Quartier de l'Europe
2, rue Georges Guynemer
78283 Guyancourt Cedex
Tel. +33 (0) 1 30573939
Fax +33 (0) 1 30570001
info-fr@nsk.com

Germany, Austria, Switzerland, Nordic

NSK Deutschland GmbH
Harkortstraße 15
40880 Ratingen
Tel. +49 (0) 2102 4810
Fax +49 (0) 2102 4812290
info-de@nsk.com

Italy

NSK Italia S.p.A.
Via Garibaldi, 215
20024 Garbagnate
Milanese (MI)
Tel. +39 02 995 191
Fax +39 02 990 25 778
info-it@nsk.com

Poland & CEE

NSK Polska Sp. z o.o.
Warsaw Branch
Ul. Migdałowa 4/73
02-796 Warszawa
Tel. +48 22 645 15 25
Fax +48 22 645 15 29
info-pl@nsk.com

Russia

NSK Polska Sp. z o.o.
Russian Branch
Office I 703, Bldg 29,
18th Line of Vasilievskiy Ostrov,
Saint-Petersburg, 199178
Tel. +7 812 3325071
Fax +7 812 3325072
info-ru@nsk.com

Spain

NSK Spain, S.A.
C/ Tarragona, 161 Cuerpo Bajo
2^a Planta, 08014 Barcelona
Tel. +34 93 2892763
Fax +34 93 4335776
info-es@nsk.com

Turkey

NSK Rulmanları Orta Doğu Tic. Ltd. Şti
19 Mayıs Mah. Atatürk Cad.
Ulya Engin İş Merkezi No: 68/3 Kat. 6
P.K.: 34736 - Kozyatağı - İstanbul
Tel. +90 216 4777111
Fax +90 216 4777174
turkey@nsk.com

MIDDLE EAST

Dubai

NSK Bearings Gulf Trading Co.
JAFZA View 19, Floor 24 Office 2/3
Jebel Ali Downtown,
PO Box 262163
Dubai, UAE
Tel. +971 (0) 4 804 8205
Fax +971 (0) 4 884 7227
info-me@nsk.com

NORTH AND SOUTH AMERICA

United States of America

NSK Americas, Inc.
4200 Goss Road
Ann Arbor, Michigan 48105
Tel. +1 734 913 7500
Fax +1 734 913 7511

NSK Latin America, Inc.
2500 NW 1 07th Avenue, Suite 300
Miami, Florida 33172
Tel. +1 305 4 77 0605
Fax +1 305 4 77 0377

Canada

NSK Canada Inc.
5585 McAdam Road
Mississauga, Ontario
Canada L4Z 1 N4
Tel. +1 905 890 07 40
Fax +1 800 800 2788

Argentina

NSK Argentina SRL
García del Río 2477
Piso 7 Oficina „A“ (1429)
Buenos Aires
Tel. +54 11 4704 51 00
Fax +54 11 4704 0033

Brazil

NSK BRASIL LTDA.
Rua 13 de Maio
1633-14th Andar-Bela Vista-CEP
01327-905 Sao Paulo, SP
Tel. +55 11 3269 4786
Fax +55 11 3269 4720

Peru

NSK PERU S.A.C.
Av. Caminos del Inca 670
Ofic: #402
Santiago del Surco
Lima
Tel. +51 1 652 3372
Fax +51 1 638 0555

Mexico

NSK Rodamientos Mexicana
S.A. DE C.V.
Av. Presidente Juárez No.2007 Lote 5
Col. San Jeronimo Tepellalcálco
Tlalnepanitla, Estado de Mexico
C.P. 54090
Tel. +52 (55) 3682 2900
Fax +52 (55) 3682 2937

Please also visit our websites:

www.nsk.com | www.au.nsk.com | www.nskeurope.com | www.nskamericas.com

Every care has been taken to ensure the information in this publication is accurate but no liability can be accepted for any errors or omissions.
© Copyright NSK 2015. The contents of this publication are the copyright of the publishers. Printed in Switzerland. Ref: H800/A/E/01.16

