NANOMOTION

A Johnson Electric Company

Nanomotion Vacuum and Ultra High Vacuum Motors

Bake-out Procedure

D/N: HR00458001-01 REV: B

May 2010

Nanomotion Ltd. POB 623, Yokneam 20692, Israel
Tel: 972-73-2498000 Fax: 972-73-2498099
Web Site: www.nanomotion.com
E-mail: nano@nanomotion.com

Copyright

This document contains proprietary information of Nanomotion Ltd., and may not be reproduced in any form without prior written consent from Nanomotion Ltd.

No part of this document may be reproduced, translated, stored in a retrieval system or transmitted in any form and by any means, electronic, mechanical, photographic, photocopying, recording, or otherwise, without the written permission of Nanomotion Ltd.

Information provided in this document is subject to change without notice and does not represent a commitment on the part of Nanomotion Ltd.

Copyright January 2007, May 2010, Yokneam, Israel. All rights reserved.

All products and company names are trademarks or registered trademarks of their respective holders.

This page is intentionally left blank.

Table of Contents

1 TO THE USER OF THIS MANUAL 5
1.1 Scope 5
1.2 Introduction 5

2 BAKE-OUT INSTRUCTIONS 6
2.1 Motors Only 6
2.2 Full Systems with Motors Mounted 8
2.3 Multiple Motors per Axis Systems 9

3 CONTACT INFORMATION 10
3.1 Customer Service 10
3.2 General Inquiries and Ordering 10

1 To the User of This Manual

1.1 Scope

This manual is intended to guide the user in performing the bake-out procedure on Nanomotion (NM) vacuum (V), vacuum non-magnetic (VN) and ultra high vacuum (UHV) motors, prior to their operation. The bake-out procedure should be performed in a vacuum oven, either on motors alone or, on complete systems with motors mounted, under approval of the stage manufacturer.

1.2 Introduction

Nanomotion supplies clean V, VN and UHV motors, yet a bake-out procedure is required, in order to remove residual contaminants and adsorbed humidity from the motors and other system components.

Nanomotion also supplies ready for use, baked motors, upon customer's request.

Important:

- **Wear suitable rubber over cotton gloves while handling vacuum motors.**
- **Prior to bake-out of a complete system, please consult the system manufacturer as to a potential impact the bake-out might have on the system.**

2 Bake-out Instructions

2.1 Motors Only

- Nanomotion supplies both V and VN motors with a motor connector for initial operation, for instance, a burn-in procedure. These connectors are non-vacuum compatible. Therefore, in order to assure optimal motors bake-out, it is recommended to cut off the connectors before bake-out.
- The UHV motors are supplied with 3 flying wire leads and no connector.

Nanomotion suggests performing the following steps for V, VN and UHV motors:

2.1.1 Nanomotion supplies V, VN and UHV versions of HR4 and HR8 motors with preload screws retracted. Prior to bake-out, release the motor preload screws (half turn clockwise).

2.1.2 Cut the motor connector off (for V and VN motors).

2.1.3 Short-circuit the three wire leads of the motor cable: white, black and red.

2.1.4 Place the motor in a vacuum oven.

2.1.5 Attain vacuum level, specified in Table 1:

Motor Type	Minimal Recommended Vacuum Level (Torr)	Temperature (°C) without Motor Connector	Temperature (°C) with NM Motor Connector	Duration (hours)
V, VN	10^{-4}	110	100(*)	24
UHV	10^{-4}	140	N/A	24

Table 1: Bake-out Conditions

Note (*):

- *Bake out at 100°C may not be sufficient to achieve full motor baking.*

2.1.6 Gradually raise the temperature, at a maximum rate of 4°C/min to the temperature, specified in Table 1.

2.1.7 Maintain the motor for 24 hours in the oven under the specified vacuum conditions.

2.1.8 Gradually cool down the vacuum oven at a typical rate of no more then 4°C/min.

2.1.9 After the vacuum oven has reached room temperature leave the motor for relaxation time at an ambient temperature for **48 hours, before testing or mounting the motor**.

2.1.10 After 48 hours, retract motor preload screws. The motor is ready for testing or mounting.

2.2 Full Systems with Motors Mounted

For baking-out a full system with motors mounted, perform the following steps:

2.2.1 Disconnect the motor connector from the driver (or the LC box).

2.2.2 It is assumed that the motor connector is not the NM original connector but rather a custom connector chosed by the stage designer. Verify the pinout of the actual connector, used in the system, and identify the pins associated with the three wire leads of the motor cable: white, black and red.

2.2.3 Short-circuit connector's motor pins:

- Short circuit the pins associated with three wire leads of the motor cable: white, black and red.
- If the NM original connector is maintained, short circuit according to Table 2:

Wire	Pin
White	3
Black	4
Red or Orange	5

Table 2: Motor 9 Pin D-Type Connector Description

2.2.4 Place the system in a vacuum oven.

2.2.5 Perform bake-out according to steps 2.1.5 - 2.1.9.

2.3 Multiple Motors per Axis Systems

For baking-out a system, with motors mounted and conencted by means of branch cables, perform the following steps:

2.3.1 Disconnect the motors from the branch cable.

2.3.2 Place the system in a vacuum oven.

2.3.3 Perform steps from 2.2.2 to 2.2.5.

3 Contact Information

3.1 Customer Service

Contact your local distributor or email Nanomotion Ltd. Technical Support Department at **techsupport@nanomotion.com**, with detailed problem description.

3.2 General Inquiries and Ordering

- **Outside the USA**

Nanomotion Ltd. Headquarters

Nanomotion Ltd.

PO Box 223

Yokneam, Israel 20692

Tel: + 972-73-2498065

Fax: + 972-73-2498099

Web site: www.nanomotion.com

Email: nano@nanomotion.com

- **In the USA**

Nanomotion Inc. (US) Headquarters

Nanomotion Inc

1 Comac Loop, Ste. 14B2

Ronkonkoma, NY 11779

Tel: (800) 821-6266

Fax: (631) 585-1947

Web site: www.nanomotion.com

Email: nanous@nanomotion.com