

## Bosch Rexroth North America 2009 Technology Training

Genuine Rexroth technology training from the Drive & Control experts



# Drive & Control Technology Training Overview in North America



**Electric Drives & Controls**  
Drives, Controls,  
Welding, and Tightening



**Hydraulics**  
Industrial and Mobile



**Linear Motion & Assembly Technology**  
Mechanical Motion and  
Assembly Components



**Pneumatics**  
Basic, Advanced, Fieldbus,  
Electro-proportional

**On-site and Regular Scheduled Courses.  
Reality Based Training from the Drive &  
Control Expert – Rexroth.**

### **Comprehensive Training**

As a single-source supplier for all drive, control, and motion technologies, Rexroth also offers reality based technology training throughout North America. The goal is maximum benefit for the user.

### **Which one is best for you? Regular scheduled classes or technology training at your facility?**

Scheduled technology courses offer the participant the advantage of state-of-the-art Rexroth training equipment and facilities located throughout North America. Rexroth also offers on-site technology training customized to your specific needs with equipment and applications right in your facility. Customized training addresses what your employees need to learn as applicable to their specific tasks.

### **Professional Technology Training Systems, Components and Teachware**

Lifelong learning is not only a slogan any more, it has become reality. In order to keep up with rapid technology changes and developments, new learning methods must be used.



Bosch Rexroth Training Systems are based on interactive learning methods with reference to real industrial applications. Bosch Rexroth uses only industrial components in its highly flexible and expandable Training Tools as well as the latest and modern interactive e-learning concepts and courses.

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## Electric Drives and Controls Training Regularly Scheduled Courses



### Drives

#### HDD/HDS Digital Servo Drive with HVE/HRV Power Supply (Course 107)

– **3 days:** Theory of operations, functions of major components, SERCOS, electrical interface, diagnostics, and practical troubleshooting.

#### DKC Single Axis Digital Servo Drive (Course 108) – 2 days:

Theory of operations, functions of major components, SERCOS, electrical interface, diagnostics, and practical troubleshooting.

#### IndraDrive Basic Servo Drive (Course 1110) – 2 days:

This two day course provides for familiarization with the electrical connections, functions, on-board I/O, and various operating modes of the Bosch Rexroth IndraDrive digital servo drive. This course also covers the use of Drive Top™/ Indra-Works™ software for parameterization of drives, system and fault information and system recognition of components.

#### IndraDrive Safety Technology Function (Course 1130) – 1 day:

This one day course covers the use of the integrated Safety Technology function in the Bosch Rexroth IndraDrive Digital Servo Drive. This course expands on the knowledge

gained in the course # 1110. The set-up and operation of the function is covered and performed in the drive. The history and current machine requirements of the technology are discussed to help the student further understand the operation of the function and how it relates to various other machine/process functions.

#### IndraDrive Motion – Logic in Drive, Single Axis (MLD-S) (Course 1140) – 2 days:

This two day course covers the Motion - Logic function through the CCD command module in the Bosch Rexroth IndraDrive Digital Servo Drive. This course expands on the knowledge gained in course # 1110. The set-up, parameterization and operation of the function is covered and performed in the drive. The student will learn the full capacity of the integrated PLC, task timing, system I/O capabilities, expansion options and programming. SERCOS III communication is introduced along with the different methods available for interfacing with the hierarchal devices and HMIs.

#### IndraDrive Motion - Logic in Drive, Multiple Axes (MLD -M) (Course 1150) – 2 days:

This two day course covers the Motion - Logic function through the CCD command module in the Bosch Rexroth IndraDrive Digital Servo Drive as it applies to controlling multiple axes. This course expands on the knowledge gained in course # 1110. The set-up, parameterization and operation of the function is covered and performed in the integrated CCD option module and in the drives. The student will learn the full capability of the integrated PLC, task

timing, system I/O capabilities, expansion options and programming. SERCOS III communication is introduced along with the different methods available for interfacing/communicating with multiple servo drives, hierarchal devices and HMIs.

### Controls

#### CLM-A 4-Axis Control System (Course 115) – 3 days:

Understanding of control capabilities is promoted through examination of keyboard and display features, parameters and programming commands.

#### TRANS 200 Transfer Line Control (Course 131) – 3 days:

Understanding of control capabilities is promoted through the examination of keyboard and display features, parameters and programming commands using BTV-04 Small HMI.

#### Visual Motion 9 System Basics (Course 142) – 3 days:

Designed for the new Power PC user. Understanding of control capabilities is promoted through the use of visual Motion software.

#### PPC Syntax Control (Course 156) – 5 days:

An overall understanding of control capabilities is promoted through the examination of system options, parameters and system commands using Bosch Rexroth Synax system Versions 11, 12, and 13.

#### L20/L40 MLC Motion and Logic Control (Course 2100) – 4 days:

This course is designed for the new L20 or L40 motion control using IndraWorks version 1 software. An overall understanding of control capabilities is promoted through the use of IndraWorks software.

**Visual Motion version 11 System Basics with IndraLogic (Course 343) – 5 days:**

An overall understanding of control capabilities is promoted through the use of Visual Motion software.

**MTX Maintenance and Troubleshooting (Course 4110) – 5 days:**

This course is designed for the Maintenance/Control Electrician. An overall understanding of control capabilities are promoted through the use of IndraWorks software. The course includes instructions on terminology relative to the MTX platform, computer software and control software functionality, principals of communication, IndraWorks Engineering desktop and IndraWorks HMI. Contact the Training Coordinator for additional course details.

**MTC 200 Maintenance and Troubleshooting Ver.23 (Course 561) – 5 days:**

Designed for the Maintenance Electrician.

**IndraLogic Program Basics (Course 600) – 2 days:**

This two day course is designed to familiarize the new user to the IndraLogic PLCopen programming environment. Subjects covered include communication, target configuration and variable types. Several languages will be covered including Structured Text, Ladder Diagram, Function Block Diagram, Sequential Function Chart and Continuous Function Chart.

**IndraLogic Control Basics (Course 610) – 3 days:**

This three day course is designed to give the experienced PLC

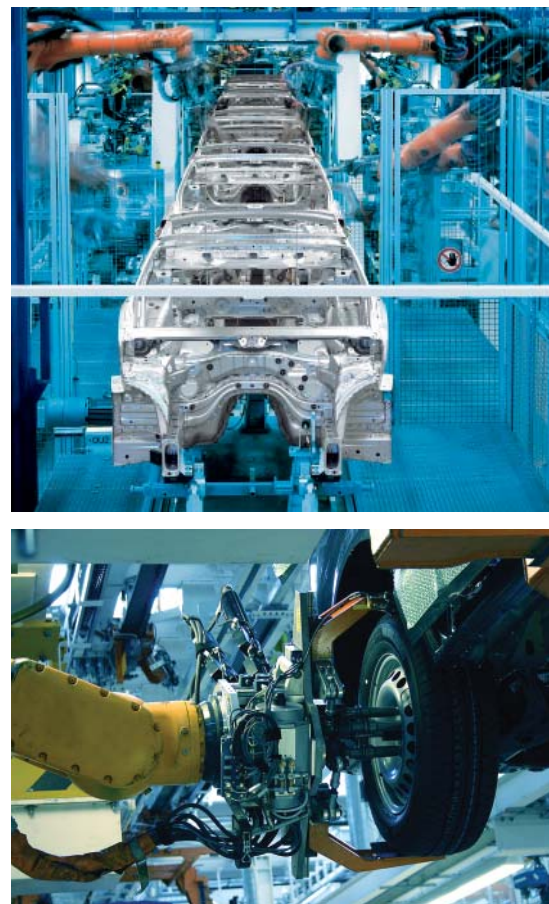
user the tools necessary to develop their processes in the IndraLogic PLCopen programming environment. Subjects covered include Project Structure, Library management and creation, device specific Target setting, device specific PLC configurations, Task configuration, Variable types, Fieldbuses, Function Block Motion programming, etc. Programming languages include Structured Text, Ladder Diagram, Function Block Diagram, Sequential Function Chart and Continuous Function Chart.

**IndraLogic Advanced Programming (Course 620) – 2 days:**

This two day course is designed to give the experienced IndraLogic user the tools necessary to further develop their processes. Using the exercises created in course # 610, the student will be adding additional data types to enhance process capabilities. Additional data types used will be Arrays, Data Structures and Enumerations. The student will also be using programming options for working with STRING data.

**VI Composer with VCP Terminals**

**(Course 7100) – 3 days:** This course of Bosch Rexroth VI Composer Software, version 2 for VCP operator terminals provides for familiarization with the software and the various operator panel hardware types. The course uses the VCP 25.2 touch-screen panel demonstration units. Discussion covers the various VCP hardware types, including interconnects and communication operations. The student will have hands-on exercises to



upload and download data (including recipes) to/from a PLC program to the VCP panel. The student will also create new screens for the upload/download of program variables, servo axis control and diagnostic messages.

**Tightening & Welding**

**Bosch Tightening System (BT 300) – 2 days:** Includes hardware, component interchange, tightening theory, system maintenance and programming concepts using the B 300 interface software.

**Weld Controller (W 200) – 3 days:** Designed for the weld engineers, programmers and maintenance electricians. Theory of operation and function of major components.

*Continued on next page.*

## Hydraulics Training Regularly Scheduled Courses

*Continued from previous page.*

### Electric Drives and Controls Training Locations and Enrollment



For our 2009 Electric Drives and Controls training course dates, please visit the Bosch Rexroth USA & Canadian websites. Scheduled courses are being offered from January through December.

#### Locations, USA & Canada

Hoffman Estates, Illinois  
Rochester Hills, Michigan  
Burlington, Ontario

#### For USA enrollment contact:

Heather F. Michel  
Training/PSE Coordinator  
Tel: (847) 645-4061  
Fax: (847) 645-1201  
heather.michel@boschrexroth-us.com  
<http://www.boschrexroth-us.com>

#### For Canadian enrollment contact:

Carol Gerritsen  
National Training Coordinator  
Tel: (905) 335-5511 x237  
Fax: (905) 335-4357  
carol.gerritsen@boschrexroth.ca  
<http://www.boschrexroth.ca/training>

### Industrial

#### POH Principles of Hydraulics – 5 days:

Industrial and mobile hydraulic equipment maintenance personnel learn the principles of hydraulics.

#### MRS Maintenance, Repair & Setup of Industrial Hydraulics – 5 days:

Maintenance personnel learn proper methods of maintenance and troubleshooting.

#### FSP Fundamentals & Servicing of Proportional Valves – 5 days:

Plant maintenance personnel of all levels and plant engineering personnel learn the function and operation of electro-proportional hydraulic valves and their interface electronic amplifiers. This seminar is recommended for the mechanical and electrical craft persons.

#### PCO Pumps and Controls (Open Loop) – 5 days:

Advanced plant maintenance technicians and hydraulic system designers develop their knowledge of popular variable displacement pumps and pump controls used in open loop pumping systems.

#### PCC Pumps and Controls (Closed Loop) – 5 days:

Advanced plant maintenance technicians and hydraulic system designers develop their knowledge of popular variable displacement pumps and pump controls used in closed loop pumping systems.



#### DCH Design Considerations for Hydraulic Systems – 5 days:

Advanced maintenance technicians and hydraulic project engineers learn to properly select hydraulic components that will produce efficient hydraulic circuits that properly control the machine or process.

#### PSD Proportional and Servo Circuit Design – 5 days:

Engineering personnel and hydraulic project engineers who are responsible for the implementation and design of proportional valve and servo valve circuitry will develop the design concepts they need for the proper application of components to achieve good control of a hydraulic axis.

#### ECH Electronic Controls for Hydraulic Systems – 5 days:

Advanced plant maintenance technicians, hydraulic system designers and controls engineers develop their knowledge of the electronic control of electro-proportional hydraulic valves used in closed process loop systems. (Updated for '07 emphasizing Bosch Rexroth DMX & HACD digital controller platforms)

*Course headings shown in blue are offered in both the USA and Canada. Headings in black are regularly scheduled only in the USA, but are offered on request in Canada.*

## Mobile

**MHT Mobile Hydraulic Technology – 5 days:** Mobile maintenance technicians and mobile hydraulic system designers will develop their understanding of specific components and circuits used in mobile equipment.

**MRSM Maintenance, Repair & Setup of Mobile Hydraulics – 5 days:** Mobile hydraulic maintenance personnel learn proper methods of maintenance and troubleshooting.

**DCHM Design Considerations for Mobile Hydraulic Systems – 5 days:** Advanced maintenance technicians and hydraulic project engineers learn to properly select hydraulic components that will produce efficient hydraulic circuits that properly control mobile equipment.

**PCO Pumps and Controls (Open Loop) – 5 days:** Advanced plant maintenance technicians and hydraulic system designers develop their knowledge of popular variable displacement pumps and pump controls used in open loop pumping systems.

**PCC Pumps and Controls (Closed Loop) – 5 days:** Advanced plant maintenance technicians and hydraulic system designers develop their knowledge of popular variable displacement pumps and pump controls used in closed loop pumping systems.

**PPM Piston/Motors and Controls – 5 days:** Proper selection and sizing of piston units as well as considerations regarding control type selection. Disassembly, inspection, and adjustments of various pumps, motors, and controls.



## Industrial and Mobile Hydraulic Training Locations and Enrollment



For our 2009 Industrial and Mobile Hydraulic training course dates, please visit the Bosch Rexroth USA & Canadian websites. Scheduled courses are being offered from January through December.

### Locations, USA

Bethlehem, Pennsylvania  
Spokane, Washington

### Locations, Canada

Burlington, Ontario  
Burnaby, British Columbia  
Edmonton, Alberta

### For USA enrollment contact:

Lois Maura  
Training Coordinator  
Tel: (610) 694-8407  
Fax: (610) 694-8339  
lois.maura@boschrexroth-us.com  
<http://www.boschrexroth-us.com>

### For Canadian enrollment contact:

Carol Gerritsen  
National Training Coordinator  
Tel: (905) 335-5511  
Fax: (905) 335-4184  
carol.gerritsen@boschrexroth.ca  
<http://www.boschrexroth.ca/training>

# Pneumatic Technology Training

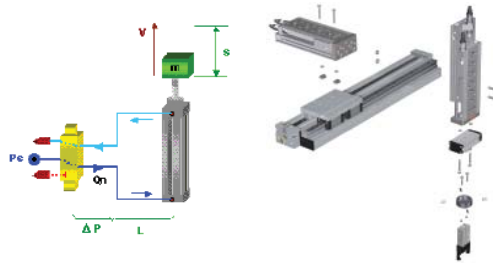


**Basic Pneumatic Technology – 2 days:** This course covers fundamental principals of pneumatics, standard component types and operation, and schematic symbols and operation. Hands-on lab exercises are a major part of this course.

**Advanced Pneumatic Technology – 2 days:** This course covers further understanding of the gas laws, fundamental sizing calculations, and sequence controls and concepts. Hands-on lab exercises are a major part of this course.

**Electro and Proportional Pneumatic Technology – 3–4 days:** This course covers construction and operation of solenoid valves, electric sequence and PLC interfaces, proportional pressure control, and closed loop electro-pneumatic concepts. Hands-on lab exercises are a major part of this course.

**Fieldbus for Automation – 3–4 days:** This course covers industrial serial link interfaces with modern automation components such as pneumatic valve manifolds and proportional devices. Node configuration, addressing, and diagnostics are explained as they would apply in the main industrial fieldbus protocols. Hands-on lab exercises are a major part of this course.



## Pneumatic Technology Training Location and Enrollment



**Location**  
Rochester Hills, Michigan

**Contact**  
Thomas Dwyer  
Tel: (248) 267-4082  
Fax: (248) 853-2079  
thomas.dwyer@boschrexroth-us.com

# Bosch Rexroth Mexico Training

## Mexico Training Location and Enrollment



**Contact**  
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Bosch Rexroth Mexico  
Netuno 72 Col Unidad Industrial  
Mexico City, DF 07700  
Tel: 52 (55) 5747-0800  
Fax: 52 (55) 5754-5073  
mariana.martos@boschrexroth.com.mx

## Linear Motion and Assembly Training

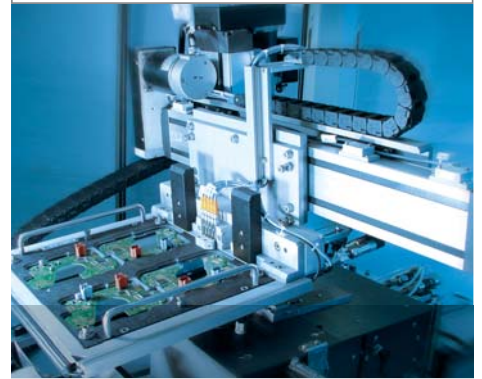
### Linear Motion

**Basic and Advanced Product Training – 3–5 days:** Detailed review of all Rexroth linear motion products, application tools, sizing software, and hands-on assembly for linear bushings, profiled rail, ball screws, linear modules, and Cartesian Motion Systems.

### Assembly Technology

**Basic and Advanced Product Training – 1–2 days:** Detailed product, application, software and service over-view of Rexroth manual and automated assembly technologies: palletized conveyors, material transport conveyors, aluminum structural framing, and manual production systems.

### Linear Motion and Assembly Training Location and Enrollment



#### Linear Motion

##### Contact

Ingrid Jones  
Tel: (704) 714-8591  
Fax: (704) 583-7291  
ingrid.jones@boschrexroth-us.com

#### Assembly Technology

##### Contact

Sabine Wheelley  
Tel: (269) 697-5247  
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sabine.wheelley@boschrexroth-us.com

## Bosch Rexroth Training Systems Training Literature and Teachware



### Bosch Rexroth Technology Training Program



Drive & Control Technology Training



Training Systems



Teachware Literature



Drive & Control Knowledge Portal

*Tell me and I will forget.  
Show me and I might remember.  
Let me do it and I will be able.*

As a single source supplier of all drive and motion technologies, Bosch Rexroth also offers modern, professional training systems, training literature, teachware, and state-of-the-art e-learning modules.

#### Hydraulics

DS4 Hydraulic Training System  
Web & Media Trainings Software  
Training Manuals

#### Electrical/Electronics

Bus & PLC Web and Media Software

#### Pneumatics

DS3 Pneumatic Training System  
Web & Media Training Software  
Training Manuals

#### Mechatronics

Modular Systems  
e-trainer, interactive software  
Training Manuals

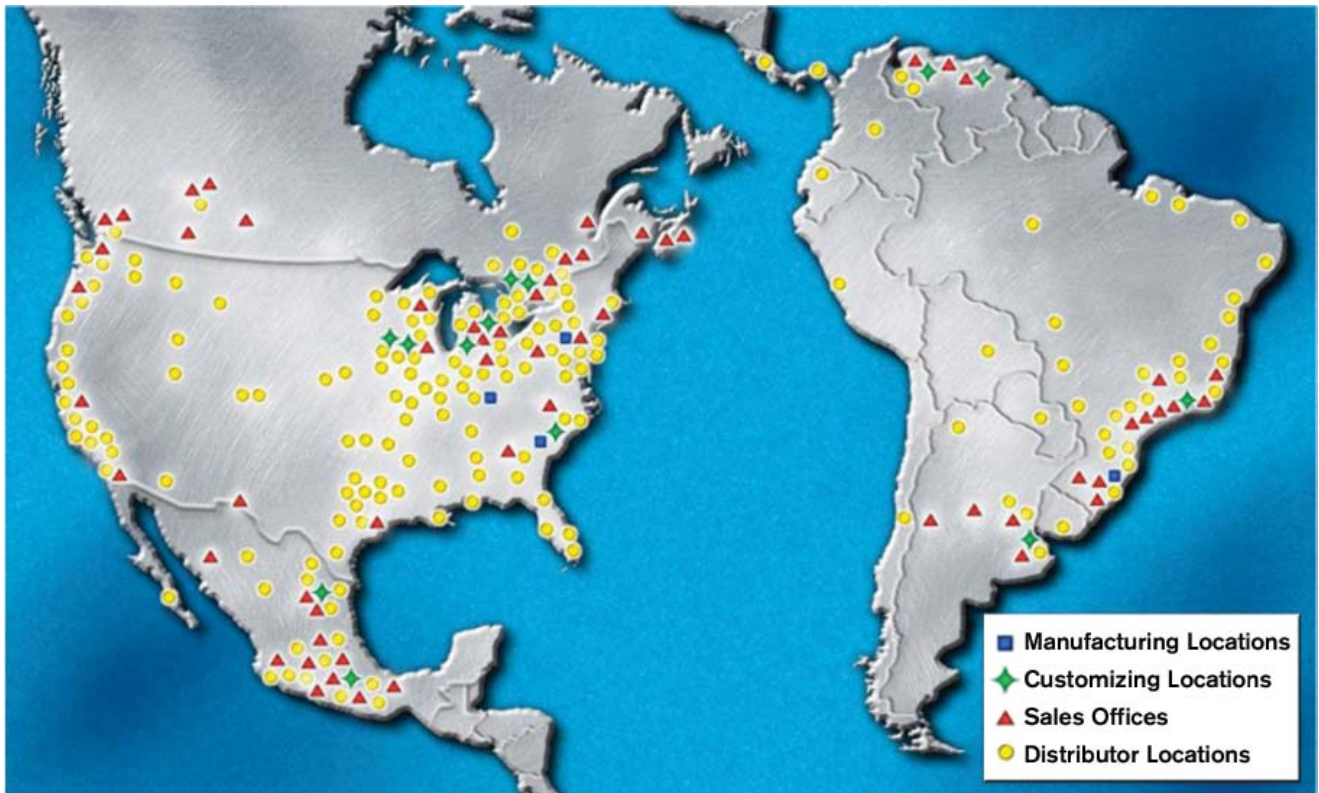
### Training Systems and Teachware

#### Contact

Joachim Scholz  
Tel: (859) 281-3432  
Fax: (859) 281-3436  
joachim.scholz@boschrexroth-us.com

## Bosch Rexroth in the Americas

### Engineering support when and where you need it



## Authorized Distribution Network

### Engineering support when and where you need it

Believing that collaboration is stronger than competition, Bosch Rexroth has committed significant resources to make the USA nationwide Distributor Network the best trained, best supported Distribution Organization in the Industry.

Bosch Rexroth Drive & Control Distributors are not just Sales Channels. They are engineering partners, fully equipped to assist you in any of your design, manufacturing or technical challenges.

Visit the Bosch Rexroth web site to find which Distributor Partner serves your specific area.





# Bosch Rexroth – a global presence

## Worldwide Sales and Support

With sales and support facilities in more than 80 countries, you can be assured that wherever you operate or deliver, the Rexroth Team will stand behind you.

## Local Support

Rexroth is a global partner. No matter where you ship your machine or equipment, you can easily get local support.

## Comprehensive Training

Take advantage of our comprehensive schedule of training programs. Held in Rexroth facilities or at your location. Rexroth provides training for customers around the world.

## 1-800-Rexroth (739-7684)

24 hours a day, 7 days a week, product application and service specialists are deployed to service centers throughout the world to provide expert help at any time. Rexroth global service gives you access to our service network anywhere.



## The Drive & Control Company

Bosch Rexroth provides a complete range of best-in-class products, systems, and services for drive, control, and motion technologies. A global supplier, we provide a broad range of products in more than 80 countries. Our markets are successful in industrial and factory automation as well as mobile applications and our solutions serve many industries.



## Training and Training Systems

To make the best use of our components and systems, it is helpful to know their wide-ranging characteristics and capabilities. To provide this knowledge, we offer real Rexroth Training to qualified employees of machine and equipment manufacturers and users. Our training programs use practical hands-on teaching methods ranging from simple installation instructions to complex systems. Products include factory on-site training, customer-specific training, in-house training courses, professional training systems, manuals and Teachware for customers, and colleges that specialize in the technology areas of hydraulics, pneumatics, electronics, and mechatronics.

- Electric Drives and Controls
- Hydraulics
- Linear Motion and Assembly Technologies
- Pneumatics
- Service

## The Drive & Control Company

Bosch Rexroth Corporation  
Corporate Headquarters  
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[www.boschrexroth-us.com](http://www.boschrexroth-us.com)

### **Bosch Rexroth Regional Sales Offices:**

#### **Central**

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Facsimile (847) 551-9812

#### **Great Lakes**

Bosch Rexroth Corporation  
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Rochester Hills, MI 48309  
Telephone (248) 267-4000  
Facsimile (248) 853-2033

#### **Northeast**

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East Granby, CT 06026  
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Facsimile (860) 844-8595

Bosch Rexroth Corporation  
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Telephone (610) 694-8300  
Facsimile (610) 694-8467

#### **Southeast**

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Charlotte, NC 28273  
Telephone (800) 438-5983  
Facsimile (704) 583-0523

#### **Southwest**

1520 Selene Drive  
Carrollton, TX 75006  
Telephone (800) 739-7684

#### **West**

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Facsimile (925) 227-1081

Bosch Rexroth Corporation  
13766 Alton Parkway, Suite 147  
Irvine, CA 92618-1622  
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### **Bosch Rexroth U.S. Business Unit Offices**

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Facsimile (610) 694-8467

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Technologies  
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Facsimile (704) 583-0523

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Facsimile (864) 967-8900

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Facsimile +1 (905) 335-4184

The data specified herein only serves to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The given information does not release the user from obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

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