

## DIAX04 Drive With Servo Function

Firmware Version Notes: SSE 03VRS

**SYSTEM200**

**Title** DIAX04  
Drive With Servo Functions

**Type of Documentation** Firmware Version Notes: SSE 03VRS

**Document Typecode** DOK-DIAX04-SSE-03VRS\*\*-FV01-EN-P

**Internal File Reference**

- Box 61-03V-EN
- 120-0800-B302-01/EN
- Based on: SSE: 03V06

**Purpose of Documentation** The following documentation is a complement to the description of functions DOK-DIAX04-SSE-03VRS\*\*-FK01-EN-P  
It describes the differences between DIAX04-SSE-03VRS and DIAX04-SSE-02VRS.

**Record of Revisions**

Description	Release Date	Notes
DOK-DIAX04-SSE-03VRS**-FVN1-EN-P	10.99	02VRS -> 03VRS

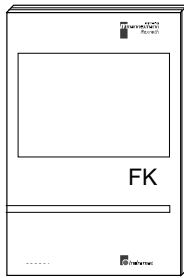
**Copyright** © 1999 Rexroth Indramat GmbH  
Copying this document, giving it to others and the use or communication of the contents thereof without express authority, are forbidden. Offenders are liable for the payment of damages. All rights are reserved in the event of the grant of a patent or the registration of a utility model or design (DIN 34-1).

**Validity** All rights are reserved with respect to the content of this documentation and the availability of the product.

**Published by** Rexroth Indramat GmbH  
Bgm.-Dr.-Nebel-Str. 2 • D-97816 Lohr a. Main  
Telephone 09352/40-0 • Tx 689421 • Fax 09352/40-4885  
<http://www.rexroth.com/indramat>  
Dept. ECD (sf/hp)

**Note** This document has been printed on chlorine-free bleached paper..

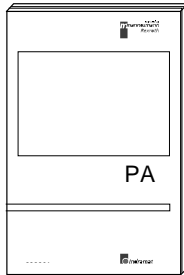
## Summary of Documentation - Box



**Functional Description:**

Description of all implemented Function based on SERCOS-Parameters

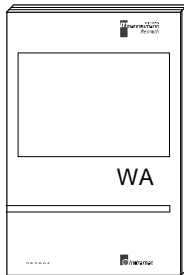
Order designation:  
DOK-DIAX04-SSE-03VRS\*\*-FK01-EN-P



**Parameter Description:**

A description of all parameters used in the firmware

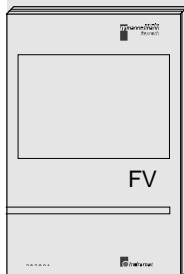
Order designation:  
DOK-DIAX04-SSE-03VRS\*\*-PA01-EN-P



**Troubleshooting Guide:**

- Explanation of the diagnostic states
- How to proceed when eliminating faults

Order designation:  
DOK-DIAX04-SSE-03VRS\*\*-WA01-EN-P

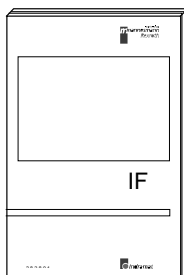


**Firmware Version Notes:**

Description of new and changed functions in terms of the derivatives:

-FWA-DIAX04-SSE02VRS-MS

Order designation:  
DOK-DIAX04-SSE-03VRS\*\*-FV01-EN-P



**Drive Configuration:**

- Determining the motor type
- Choosing the motor – motor feedback combination
- Choosing the desired function of the drive control device

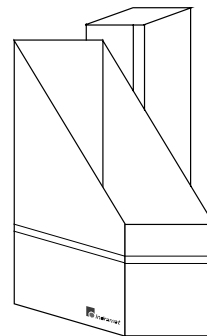
Order designation:  
DOK-DIAX04-SSE-03VRS\*\*-IF01-EN-P



**CD: DRIVEHELP**

Collection of Windows help systems which contain documents on firmware derivatives

Order designation:  
DOK-GENEERL-DRIVEHELP\*\*-GExx-MS-D0600



Order designation  
DOK-DIAX04-SSE-03VRS\*\*-6101-EN-P

## Notes

# Contents

<b>1</b>	<b>General Information .....</b>	<b>1-1</b>
1.1	Product Family .....	1-1
1.2	Documentation .....	1-1
<b>2</b>	<b>Versionsnotes FWA-DIAX04-SSE-03VRS-MS.....</b>	<b>2-3</b>
2.1	Notes on Replacing the Firmware.....	2-3
2.2	Release notes .....	2-3
2.3	Checksums.....	2-3
2.4	New Basic Functions.....	2-4
	Multiplex Channel.....	2-4
	Intelligent Safety Technologies (IST) .....	2-4
	Synchronous Motors with Incremental Measuring Systems .....	2-4
	Fieldweakening for Synchronous Motors .....	2-4
	Command „B0 Cool brakes“ .....	2-4
	Linear or cubic position command value interpolation in position control.....	2-5
	Taking Cooling Mode into Account when Standardizing Torque/Force Data .....	2-5
	Automatic Detection of Indramat Housing Motors .....	2-5
	New Parameters for Status Displays for Travel Range Limit Switches and E-Stop Inputs .....	2-5
	List of Last Diagnosis Numbers .....	2-5
	Filter for Actual Velocity Value .....	2-6
	Probe with Quick-Halt Function.....	2-6
2.5	Expanded/Altered Functions .....	2-7
	Absolute Encoder Evaluation and Monitoring of Two Absolute Measuring Systems .....	2-7
	Axis Error Correction .....	2-7
	Digital I/Os.....	2-7
	Analog Inputs .....	2-7
	Probe Function with „Rapid Reading“ .....	2-7
	Communication via Serial Interface .....	2-7
	Torque/Force Control with Command Value Filter.....	2-8
	Interruptible Velocity Control Loop Monitor.....	2-8
	Referencing Absolute Measuring System by Positioning to Reference Point .....	2-8
	Referencing with Permanently-Defined Traversing Path with Absolute-Coded Encoders .....	2-8
	Expansion of Parameter S-0-0403 Status Actual Position Values .....	2-9
	Motor Temperature Sensor Monitor in Linear Motors .....	2-9
	Customer Password.....	2-9
	Relative Drive-internal interpolation .....	2-9
	Drive Halt.....	2-9
	Position Limit Monitoring.....	2-10

2.6 New Parameters..... 2-11

2.7 Expanded/Altered Parameters ..... 2-13

2.8 Deleted Parameters ..... 2-13

**3 Kundenbetreuungsstellen - Sales & Service Facilities ..... 3-1**

# 1 General Information

## 1.1 Product Family

The product release description refers to the product family:

<p><b>DIAX04</b> Drive With Servo Function FWA-DIAX04-SSE-03VRS-MS</p>
--

The following drive controls can be operated with this software:

The released firmware applies to the following drive controllers:	HDS02.1	HDS03.1	HDS04.1	HDD02.1
	HDS02.2	HDS03.2	HDS04.2	HDD02.2

## 1.2 Documentation

The documentation for product **FWA-DIAX04-SSE-03VRS** is available as follows:

Paper form  
Windows help system

The following table contains a summary of available items.

POS	Type	Document style	Part number	Symbol number
1	DOK-DIAX04-SSE-03VRS**-6101-EN-P	Box 61-03V-EN Paper	284046	120-0800-B304-01
2	DOK-DIAX04-SSE-03VRS**-FK01-EN-P	Functional Description Paper	284050	120-0800-B305-01
3	DOK-DIAX04-SSE-03VRS**-PA01-EN-P	Parameter Description Paper	284051	120-0800-B306-01
4	DOK-DIAX04-SSE-03VRS**-IF01-EN-P	Drive Configuration Paper	284045	120-0800-B303-01
5	DOK-DIAX04-SSE-03VRS**-WA01-EN-P	Trouble Shooting Guide Paper	284052	120-0800-B307-01
6	DOK-DIAX04-SSE-03VRS**-FV01-EN-P	Firmware Version Notes Paper	284044	120-0800-B302-01
7	DOK-GENERL-DRIVEHELP**-GN03-MS-D0600	DRIVEHELP	282411	120-1300-B302-**-

Figure: 1-1: Documentation for FWA-DIAX04-SSE-03VRS

## Notes



## 2 Versionsnotes FWA-DIAX04-SSE-03VRS-MS

### 2.1 Notes on Replacing the Firmware

Prior to replacing the firmware, the following points must be noted:

- Read the entire documentation
- Store the current set of parameters

---

**Note:** The parameters that are to be secured are stored in parameter **S-0-0192, IDN-list of backup operation data**.

---

- Switch drive controller off and replace software module
- Load the parameters back in
- Check the functions

### 2.2 Release notes

Firmware version **FWA-DIAX04-SSE-03V06** represents the first official edition of version 03. It was released on **July 02.1999**.

The following drive controllers can be operated with the released software:

• HDS 02.1	• HDS 02.2
• HDS 03.1	• HDS 03.2
• HDS 04.1	• HDS 04.2
• HDD 02.1	• HDD 02.2

### 2.3 Checksums

**Program flash:** 0306 h

**Data flash:** 0306 h

**Sum:** 060C h

## 2.4 New Basic Functions

### Multiplex Channel

The firmware supports cyclic data transmission of various, freely-configurable parameters in the data containers of the transmission elements. Lists of the parameters to be transmitted for both MDTs and ATs are generated for this purpose. These are then processed in a step-by-step fashion via an index which the control specifies. Per transmission cycle the parameter of the relevant list specified via the index is transmitted via the data container of the MDT or AT.

### Intelligent Safety Technologies (IST)

The firmware is equipped with a function package which is used to protect personnel within the facility. This defines the following functions:

- a safe halt
- safe operating halt
- safely reduced velocity 1 with safely limited absolute position 1
- safely reduced velocity 2 with safely limited absolute position 2
- 4 safe cams (point at which position is changed)

### Synchronous Motors with Incremental Measuring Systems

Synchronous motors can also be operated with incremental measuring systems using this firmware. This means that the initial drive enable release signal („Ab => „AF“) automatically determines the angle and is available as of this point in time until the measuring system is re-initialized. The following encoders can be used:

- incremental sine encoder, uA level
- Incremental sine encoder, 1Vss level
- Incremental square-wave encoder, 5V-TTL
- Indramat gearwheel encoder
- gearwheel encoder with 1Vss level

---

**Note:** When determining the commutation angle it is possible that the drive can move slightly.

---

### Fieldweakening for Synchronous Motors

Fieldweakening mode is used for synchronous motors. This means motors can be used in the range of constant power (fieldweakening range). The range of constant power starts above maximum speed. Until recently, synchronous motors could only be operated up to maximum speed in the range of constant torque (basic speed range).

### Command „B0 Cool brakes“

By starting commands **P-0-0542 B100 Command Release motor holding brake** the user can cool the motor brake.

## Linear or cubic position command value interpolation in position control

The firmware has two position command value interpolators that can be activated. With linear interpolation, the specified position command values are already reached in the following cycle in the position controller. The velocity and accel pre-control, however, works abruptly. With cubic interpolation, the specified command values are reached two cycles later. The pre-controls are consistent with cubic interpolation (velocity and pre-control).

## Taking Cooling Mode into Account when Standardizing Torque/Force Data

The various cooling modes of the motor change the standstill or nominal currents of the motor. All torque/force data of the drive are scaled in per cent and relate to the standstill or nominal motor current. To get correct torque/force data for the various cooling modes, the cooling mode is taken into account when standardizing. Parameter **P-0-640, Cooling type** defines a factor that specifies the standstill or nominal currents.

Cooling	Parameter value	Factor
Uncooled	0	100 %
Cooled	1	150 %
liquid-cooled	2	190 %

**Note:** The nominal or standard current in parameter **S-0-0109, Motor peak current** is not switched so that the cooling mode factor must be taken into account when determining the physical torque.

## Automatic Detection of Indramat Housing Motors

The introduction of parameter **P-7-4014, Motor type** to the feedback memory makes it possible to automatically detect Indramat housing motors regardless of motor type set in **S-7-0141, Motor type**. Parameter **P-7-4014** is used to identify the motor if it has been validly stored and is larger than zero.

## New Parameters for Status Displays for Travel Range Limit Switches and E-Stop Inputs

For diagnoses, the travel range limit switch and E-stop inputs can be read via parameters **P-0-0222, State of Travel range limit inputs** and **P-0-0223, Status Input E-Stop function**.

## List of Last Diagnosis Numbers

The last 50 diagnoses of the drive are stored in parameter **S-0-0375, List of diagnostic numbers**, (**S-0-0390, Diagnostic message number**).

## Filter for Actual Velocity Value

Via **P-0-0538, Motor function parameter 1** an 8msec filter for parameter **S-0-0040, Velocity feedback value** can be activated which only works for the display.

## Probe with Quick-Halt Function

If in **S-0-0169, Probe control parameter** in bit 7 „1“ for quick halt with positive flank of probe 1 has been set, then the drive automatically upon detection of the positive flank goes to „Velocity command value to zero“. The drive thus decels at maximum possible torque. The drive remains in this state until the probe release for probe 1 in parameter **S-0-0405, Probe 1 enable** is cleared. Then the drive follows the command value of the control.

## 2.5 Expanded/Altered Functions

### Absolute Encoder Evaluation and Monitoring of Two Absolute Measuring Systems

The implementation of a second absolute encoder back up is now possible and two absolute measuring systems can be operated without restriction. A plausibility check of the absolute encoder data is now also possible so that an encoder change clearly deletes the reference of the encoder.

### Axis Error Correction

The correction function to compensate temperature-dependent errors are no longer supported. The following correction functions have been deactivated:

- Position-dependent temperature correction
- Position-dependent temperature correction

### Digital I/Os

The supported plug-in module for digital I/Os of signals has been reduced. The firmware now only supports modules DEA 4 and 8. It is no longer possible to allocate parameters to digital I/Os.

### Analog Inputs

The analog inputs of this firmware have been deactivated!

### Probe Function with „Rapid Reading“

The function „Rapid reading“ makes it possible to take readings of probe signals that follow each other in rapid succession without having to clear and reset probe enable (S-0-0405). The function is activated by setting bits 5 and 6 in parameter **S-0-0169, Probe control parameter**.

### Communication via Serial Interface

Communications between drive and „control“ via the serial interface is now no longer supported.

## Torque/Force Control with Command Value Filter

A VZ1 filter for torque/force command value smoothing has been built into the firmware. The filter time constant can be set via parameter **P-0-0176, Torque/Force command smoothing time constant**.

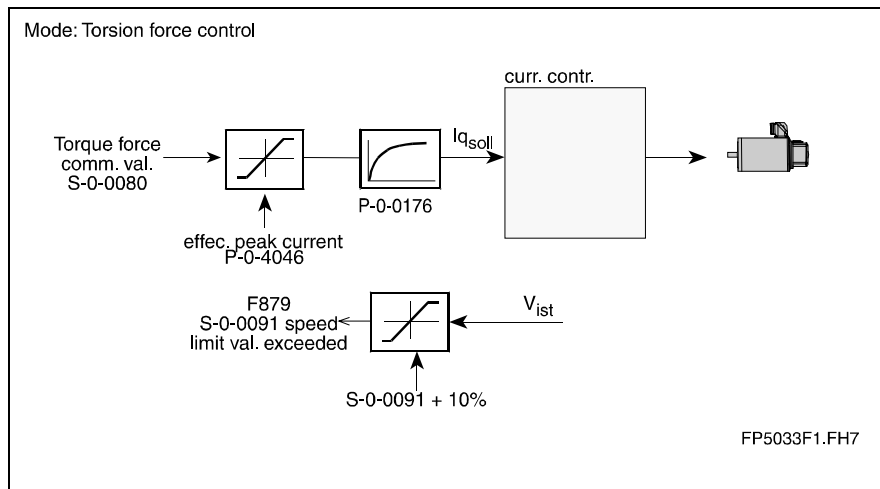


Fig. 2-2: Torque / force control

## Interruptible Velocity Control Loop Monitor

The velocity control loop monitor can be activated via parameter **P-0-0538, Motor function parameter 1**. Deactivation should only be instituted, however, in exceptional cases.

## Referencing Absolute Measuring System by Positioning to Reference Point

By setting bit 7 in parameter **S-0-0147, Homing parameter** and starting command **S-0-0148, C600 Drive controlled homing procedure command** the drive positions to home. This is also now possible with absolute measuring systems if the relevant measuring system is not reference.

## Referencing with Permanently-Defined Traversing Path with Absolute-Coded Encoders

The travel path required with distance-coded encoders to ensure referencing is fixed by the distance of the reference markers. By setting bit 8 in **S-0-0147, Homing parameter** the referencing function is activated with a fixed traversing path. The drive runs over at least two reference markers and then stops regardless of whether it has detected the reference marker or not.

## Expansion of Parameter S-0-0403 Status Actual Position Values

Two new bits have been defined in parameter **S-0-0403, Position feedback value status**.

**Expanded construction of the parameter:**

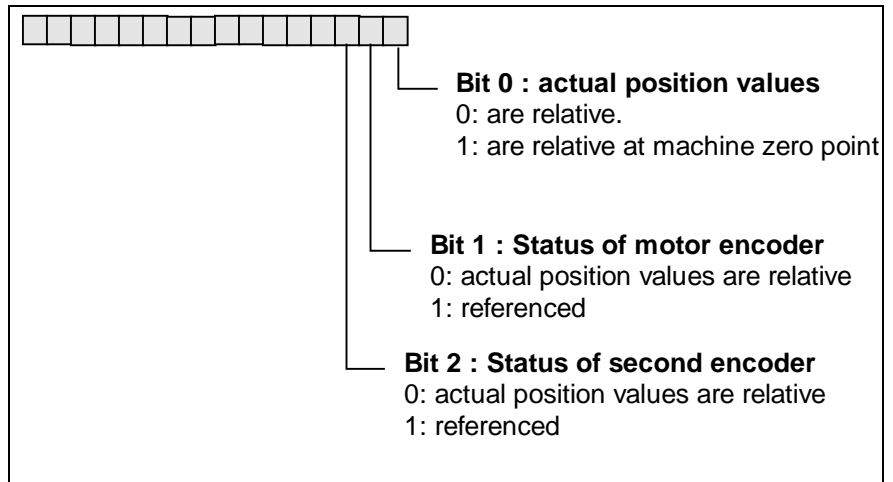


Fig. 2-3: S-0-0403, Position feedback value status

## Motor Temperature Sensor Monitor in Linear Motors

The motor temperature sensor (PTC) of linear motors is checked for cable breaks and short circuits and, if necessary, the error message **F221 Motor temp. surveillance defective** is generated.

## Customer Password

This function is no longer supported.

## Relative Drive-internal interpolation

This function is no longer supported.

## Drive Halt

The function „Drive Halt“ is now dependent from the operation mode. Depending on the operation mode from where „Drive Halt“ is activated,, the stopping is done with different input parameters for acceleration and jerk. The following applies:

Coming from position control:

- **S-0-0138, Bipolar acceleration limit value**
- **S-0-0349, Jerk limit bipolar**

Coming from velocity control or torque/force control:

- **P-0-1201, Velocity control, deceleration ramp 1**
- **P-0-1222, Velocity command filter**

## Position Limit Monitoring

The position limit monitoring is now no more solely done with the encoder defined in the **S-0-0147, Homing parameter**. As an additional criterion,, the reference of the encoders is taken. If the encoder chosen via **S-0-0147 Homing parameter** does not have a reference and a second encoder is present, which is already homed, this latter one is used for the monitoring.



## 2.6 New Parameters

- S0-0359, Drive internal interpolation mode Drive internal interpolation mode
- S-0-0360, MDT Data container A
- S-0-0364, AT Data container A
- S-0-0368, Addressing for data container A
- S-0-0370, Configuration list for MDT data container
- S-0-0371, Configuration list for the AT data container
- S-0-0375, List of diagnostic numbers
- S-0-0378, Encoder 1, absolute range
- S-0-0379, Encoder 2, absolute range
- S-7-0100, Velocity loop proportional gain
- S-7-0101, Velocity loop integral action time
- S-7-0104, Position loop Kv-factor
- S-7-0106, Current loop proportional gain 1
- S-7-0107, Current loop integral action time 1
- S-7-0117, Feedback 2 Resolution
- S-7-0177, Absolute distance 1
- S-7-0178, Absolute distance 2
- P-0-0176, Torque/Force command smoothing time constant
- P-0-0177, Absolute encoder buffer 1
- P-0-0178, Absolute encoder buffer 2
- P-0-0187, Position command processing mode
- P-0-0194, List of present plug-in modules
- P-0-0247, Version of safety functions
- P-0-0248, Checksum over scaled data, drive
- P-0-0249, Activation of the safety functions
- P-0-0250, Safety input signals of the drive
- P-0-0251, Safety output signals of the drive
- P-0-0252, State of safety function, drive
- P-0-0253, Max. speed 1 for safety function, drive
- P-0-0254, Upper position limit 1 for safety function, drive
- P-0-0255, Lower position limit 1 for safety function, drive
- P-0-0256, Max. speed 2 for safety function, drive
- P-0-0257, Upper position limit 2 for safety function, drive
- P-0-0258, Lower position limit 2 for safety function, drive
- P-0-0259, Upper position limit for position switch 1, drive
- P-0-0260, Lower position limit for position switch 1, drive
- P-0-0261, Upper position limit for position switch 2, drive
- P-0-0262, Lower position limit for position switch 2, drive
- P-0-0263, Upper position limit for position switch 3, drive
- P-0-0264, Lower position limit for position switch 3, drive

- P-0-0265, Upper position limit for position switch 4, drive
- P-0-0266, Lower position limit for position switch 4, drive
- P-0-0267, Pos. monitoring window for safe stop operation, drive
- P-0-0268, Reference position for safe homing, drive
- P-0-0269, Mask of unused safety inputs, drive
- P-0-0270, Changeover time for safety function, drive
- P-0-0271, Time interval for forced dynamization, drive
- P-0-0272, C000 Command Check reference
- P-0-0273, Monitored actual position, drive
- P-0-0274, Preset forced dynamization
- P-0-0275, Acknowledge forced dynamization
- P-0-0276, State of safety function, control
- P-0-0277, Max. speed 1 for safety function, control
- P-0-0278, Upper position limit 1 for safety function, control
- P-0-0279, Lower position limit 1 for safety function, control
- P-0-0280, Max. speed 2 for safety function, control
- P-0-0281, Upper position limit 2 for safety function, control
- P-0-0282, Lower position limit 2 for safety function, control
- P-0-0283, Upper position limit for position switch 1, control
- P-0-0284, Lower position limit for position switch 1, control
- P-0-0285, Upper position limit for position switch 2, control
- P-0-0286, Lower position limit for position switch 2, control
- P-0-0287, Upper position limit for position switch 3, control
- P-0-0288, Lower position limit for position switch 3, control
- P-0-0289, Upper position limit for position switch 4, control
- P-0-0290, Lower position limit for position switch 4, control
- P-0-0291, Pos. monitoring window for safe stop operation, control
- P-0-0292, Reference position for safe homing, control
- P-0-0293, Mask of unused safety inputs, control
- P-0-0294, Changeover time for safety function, control
- P-0-0295, Time interval for forced dynamization, control
- P-0-0296, Monitored actual position, control
- P-0-0297, Checksum over scaled data, control
- P-0-0542, B100 Command Open motor holding brake
- P-0-0560, Commutation adjustment current
- P-0-0562, Commutation adjustment periodic time
- P-0-0640, Cooling type
- P-0-4047, Motor inductance
- P-7-0004, Velocity loop smoothing time constant
- P-7-0517, Feedback-Typ 2
- P-7-4014, Motor type

## 2.7 Expanded/Altered Parameters

- S-0-0032, Primary mode of operation
- S-0-0033, Secondary operation mode 1
- S-0-0034, Secondary operation mode 2
- S-0-0035, Secondary operation mode 3
- S-0-0040, Velocity feedback value
- S-0-0147, Homing parameter
- S-0-0169, Probe control parameter
- S-0-0403, Position feedback value status
- P-0-0538, Motor function parameter 1

## 2.8 Deleted Parameters

- S-0-0282, Travel distance
- S-0-0346, Setup flag for relative command values
- P-0-0110, Parallel I/O output 2
- P-0-0111, Parallel I/O input 2
- P-0-0112, Parallel I/O output 3
- P-0-0113, Parallel I/O input 3
- P-0-0123, Absolute encoder buffer
- P-0-0124, Assignment IDN -> DEA-output
- P-0-0125, Assignment DEA-input -> IDN
- P-0-0172, Parallel I/O output 5
- P-0-0173, Parallel I/O input 5
- P-0-0174, Parallel I/O output 6
- P-0-0175, Parallel I/O input 6
- P-0-0210, Analog input 1
- P-0-0211, Analog input 2
- P-0-0212, Analog inputs, IDN list of assignable parameters
- P-0-0213, Analog input 1, assignment
- P-0-0214, Analog input 1, scaling per 10V full scale
- P-0-0215, Analog input 2, assignment
- P-0-0216, Analog input 2, scaling per 10V full scale
- P-0-0217, Analog input 1, offset
- P-0-0218, Analog input 2, offset
- P-0-0402, Pos. corr., reference temperature
- P-0-0403, Pos. corr., reference position for temperature correction
- P-0-0404, Pos. corr., actual temperature, position dependent
- P-0-0405, Pos. corr., actual temperature, position independent
- P-0-0406, Pos. corr., temperature factor position dependent
- P-0-0407, Pos. corr., temperature factor position independent [0.1/K]
- P-0-4021, Baud rate RS-232/485

- P-0-4022, Drive address
- P-0-4023, C400 Communication phase 2 transition
- P-0-4036, Contacted motor type
- P-7-0512, Default value for Kv-factor of position control
- P-7-0514, Absolute encoder offset
- P-7-4037, Velocity loop prop. gain, default
- P-7-4038, Velocity loop integral action time, default
- P-7-4039, Current loop prop. gain, default
- P-7-4042, Speed control smoothing time, default
- P-7-4049, Current loop integral action time, default

### 3 Kundenbetreuungsstellen - Sales & Service Facilities

## Kundenbetreuungsstellen - Sales & Service Facilities

### Deutschland – Germany

vom Ausland:  
from abroad:

(0) nach Landeskennziffer weglassen!!  
don't dial (0) after country code!

Vertriebsgebiet Mitte Germany Centre <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service Rexroth Indramat GmbH Bgm.-Dr.-Nebel-Str. 2 97816 Lohr am Main Telefon: +49 (0)9352/40-0 Telefax: +49 (0)9352/40-4885	Vertriebsgebiet Mitte Germany Centre <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service Mannesmann Rexroth AG Gesch.ber. Rexroth Indramat Lilistraße 14-18 63067 Offenbach Telefon: +49 (0) 69/82 00 90-0 Telefax: +49 (0) 69/82 00 90-80	Vertriebsgebiet Ost Germany East <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service Rexroth Indramat GmbH Beckerstraße 31 09120 Chemnitz Telefon: +49 (0)371/35 55-0 Telefax: +49 (0)371/35 55-333	Vertriebsgebiet Ost Germany East <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service Mannesmann Rexroth AG GB Rexroth Indramat GmbH Holzhäuser Str. 122 04299 Leipzig Telefon: +49 (0)341/86 77-0 Telefax: +49 (0)341/86 77-219
Vertriebsgebiet Süd Germany South <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service Rexroth Indramat GmbH Ridlerstraße 75 80339 München Telefon: +49 (0)89/540138-30 Telefax: +49 (0)89/540138-10 indramat.mue@t-online.de	Gebiet Südwest Germany South-West <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service Mannesmann Rexroth AG Vertrieb Deutschland – VD-BI Geschäftsbereich Rexroth Indramat Regionalzentrum Südwest Ringstrasse 70 / Postfach 1144 70736 Fellbach / 70701 Fellbach Tel.: +49 (0)711/57 61-100 Fax: +49 (0)711/57 61-125	Vertriebsgebiet Nord Germany North <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service Rexroth Indramat GmbH Kieler Straße 212 22525 Hamburg Telefon: +49 (0)40/85 31 57-0 Telefax: +49 (0)40/85 31 57-15	Vertriebsgebiet Nord Germany North <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service Mannesmann Rexroth AG Vertriebsniederlassung Region Nord Gesch.ber. Rexroth Indramat Walsroder Str. 93 30853 Langenhagen Telefon: +49 (0) 511/72 66 57-0 Telefax: +49 (0) 511/72 66 57-93
Vertriebsgebiet West Germany West <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service Mannesmann Rexroth AG Vertrieb Deutschland Regionalzentrum West Borsigstrasse 15 D - 40880 Ratingen Telefon: +49 (0)2102/409-0 Telefax: +49 (0)2102/409-406	SERVICE - Hotline - 7 Tage / 24h - <b>HELPEDESK</b> <b>MO – FR - von 7 – 17 Uhr</b> Telefax +49 (0)9352/40-4941 Telefon +49 (0)9352/40- Bernard A. -4894 Kolb R. -4922 Pfeffermann O. -4808 Roeper P. -4359 Scheiner W. -4921 <b>AUSSERHALB dieser Zeit:</b> Telefon: +49 (0)172/660 04 06 oder/or Telefon: +49 (0)171/333 88 26		ERSATZTEIL - Hotline ♦ nur an Werktagen ♦ von 15 - 18 Uhr  <b>Tel. +49 (0) 93 52/40 42 22</b>

Kundenbetreuungsstellen in Deutschland - Service agencies in Germany

## Europa – Europe

**vom Ausland:** (0) nach Landeskennziffer weglassen,

0 nach Landeskennziffer mitwählen!

**from abroad:** don't dial (0) after country code,

dial 0 after country code!

<p>Austria <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth Ges.m.b.H. Gesch.ber. Rexroth Indramat Hägelingasse 3 A - 1140 Wien</p> <p>Telefon: +43 (0)1/9852540-400 Telefax: +43 (0)1/9852540-93</p>	<p>Austria <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth G.m.b.H. Gesch.ber. Rexroth Indramat Industriepark 18 A - 4061 Pasching</p> <p>Telefon: +43 (0)7221/605-0 Telefax: +43 (0)7221/605-21</p>	<p>Belgium <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth N.V.-S.A. Gesch.ber. Rexroth Indramat Industrielaan 8 B-1740 Ternat</p> <p>Telefon: +32 (0)2/5830719 Telefax: +32 (0)2/5830731</p>	<p>Denmark <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>BEC AS Zinkvej 6 DK-8900 Randers</p> <p>Telefon: +45 (0)87/11 90 60 Telefax: +45 (0)87/11 90 61</p>
<p>England <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth Ltd. Rexroth Indramat Division Broadway Lane, South Cerney GB - Cirencester, Glos GL7 5UH</p> <p>Telefon: +44 (0)1285/863000 Telefax: +44 (0)1285/863030</p>	<p>Finland <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Rexroth Mecman Oy Rexroth Indramat division Ansatie 6 SF-017 40 Vantaa</p> <p>Telefon: +358 (0)9/84 91-11 Telefax: +358 (0)9/84 91-13 60</p>	<p>France <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A. Division Rexroth Indramat Parc des Barbanniers 4, Place du Village F-92632 Gennevilliers Cedex</p> <p>Telefon: +33 (0)141 47 54 30 Telefax: +33 (0)147 94 69 41 Hotline: +33 (0)6 08 33 43 28</p>	<p>France <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A. Division Rexroth Indramat 270, Avenue de Lardenne F - 31100 Toulouse</p> <p>Telefon: +33 (0)5 61 49 95 19 Telefax: +33 (0)5 61 31 00 41</p>
<p>France <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A. Division Rexroth Indramat 91, Bd. Irène Joliot-Curie F - 69634 Vénissieux – Cedex</p> <p>Telefon: +33 (0)4 78 78 53 65 Telefax: +33 (0)4 78 78 53 62</p>	<p>Italy <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione Rexroth Indramat Via G. Di Vittoria, 1 I - 20063 Cernusco S/N.MI</p> <p>Telefon: +39 02/92 36 52 70 Telefax: +39 02/92 36 55 12</p>	<p>Italy <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione Rexroth Indramat Via Borgomanero, 11 I - 10145 Torino</p> <p>Telefon: +39 011/7 50 38 11 Telefax: +39 011/7 71 01 90</p>	<p>Italy <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione Rexroth Indramat Via del Progresso, 16 (Zona Ind.) I - 35020 Padova</p> <p>Telefon: +39 049/8 70 13 70 Telefax: +39 049/8 70 13 77</p>
<p>Italy <input type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione Rexroth Indramat Via Mascia, 1 I - 80053 Castellammare di Stabia NA</p> <p>Telefon: +39 081/8 71 57 00 Telefax: +39 081/8 71 68 86</p>	<p>Italy <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.p.A. Divisione Rexroth Indramat Viale Oriani, 38/A I - 40137 Bologna</p> <p>Telefon: +39 051/34 14 14 Telefax: +39 051/34 14 22</p>	<p>Netherlands <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Hydraudyne Hydrauliek B.V. Kruisbroeksestraat 1 (P.O. Box 32) NL - 5281 RV Boxtel</p> <p>Telefon: +31 (0)411/65 19 51 Telefax: +31 (0)411/65 14 83 e-mail: indramat@hydraudyne.nl</p>	<p>Netherlands <input type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Hydrocare B.V. Kruisbroeksestraat 1 (P.O. Box 32) NL - 5281 RV Boxtel</p> <p>Telefon: +31 (0)411/65 19 51 Telefax: +31 (0)411/67 78 14</p>
<p>Norway <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Rexroth Mecman AS Rexroth Indramat Division Berghagan 1 or: Box 3007 N -1405 Ski-Langhus N -1402 Ski</p> <p>Telefon: +47 (0)64 86 41 00 Telefax: +47 (0)64 86 90 62</p>	<p>Poland <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth Sp.zo.o. Biuro Poznan ul. Dabrowskiego 81/85 PL - 60-529 Poznan</p> <p>Telefon: +48 061/847 67 99 Telefax: +48 061/847 64 02</p>	<p>Russia <input type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Tschudnenko E.B. Arsenia 22 RUS - 153000 Ivanovo Rußland</p> <p>Telefon: +7 093/223 96 33 oder/or +7 093/223 95 48 Telefax: +7 093/223 46 01</p>	<p>Spain <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A. Division Rexroth Indramat Centro Industrial Santiga Obradors s/n E-08130 Santa Perpetua de Mogoda Barcelona</p> <p>Telefon: +34 937 47 94 00 Telefax: +34 937 47 94 01</p>
<p>Spain <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Goimendi S.A. Division Rexroth Indramat Jolastokieta (Herrera) Apartado 11 37 E - 20017 San Sebastian</p> <p>Telefon: +34 9 43/40 01 63 Telefax: +34 9 43/39 17 99</p>	<p>Sweden <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Rexroth Mecman Svenska AB Rexroth Indramat Division Varuvägen 7 S - 125 81 Stockholm</p> <p>Telefon: +46 (0)8/727 92 00 Telefax: +46 (0)8/647 32 77</p>	<p>Slowenia <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Rexroth Indramat elektromotorji d.o.o. Otoki 21 SLO - 64 228 Zelezniki</p> <p>Telefon: +386 64/61 73 32 Telefax: +386 64/64 71 50</p>	<p>Turkey <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth Hidropar A..S. Fevzi Cakmak Cad No. 3 TR - 34630 Sefaköy Istanbul</p> <p>Telefon: +90 212/541 60 70 Telefax: +90 212/599 34 07</p>
<p>Switzerland <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth Schweiz AG Gesch.ber. Rexroth Indramat Gewerbstraße 3 CH - 8500 Frauenfeld</p> <p>Telefon: +41 (0)52/720 21 00 Telefax: +41 (0)52/720 21 11</p>	<p>Switzerland <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth Suisse SA Département Rexroth Indramat Rue du village 1 CH - 1020 Renens</p> <p>Telefon: +41 (0)21/632 84 20 Telefax: +41 (0)21/632 84 21</p>		

Europäische Kundenbetreuungsstellen (ohne Deutschland)

European Service agencies (without Germany)

**Außerhalb Europa - outside Europe**

**vom Ausland:** (0) nach Landeskennziffer weglassen!  
**from abroad:** don't dial (0) after country code!

<p>Argentina <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A.I.C.                  Division Rexroth Indramat                  Acassuso 48 41/7                  RA - 1605 Munro (Buenos Aires)</p> <p>Telefon: +54 (0)11/4756 01 40                  Telefax: +54 (0)11/4762 6862                  e-mail:mannesmann@impsat1.com.ar</p>	<p>Argentina <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>NAKASE                  Servicio Tecnico CNC                  Calle 49, No. 5764/66                  RA - 1653 Villa Balester                  Prov. - Buenos Aires</p> <p>Telefon: +54 (0) 11/4768 36 43                  Telefax: +54 (0) 11/4768 24 13                  e-mail: nakase@usa.net                  nakase@infovia.com.ar</p>	<p>Australia <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>AIMS - Australian Industrial Machinery Services Pty. Ltd.                  Unit 3/45 Home ST                  Campbellfield , VIC 3061                  AUS - Melbourne</p> <p>Telefon: +61 (0)3/93 59 02 28                  Telefax: +61 (0)3/93 59 02 86</p>	<p>Australia <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth Pty. Ltd.                  No. 7, Endeavour Way                  Braeside Victoria, 31 95                  AUS - Melbourne</p> <p>Telefon: +61 (0)3/95 80 39 33                  Telefax: +61 (0)3/95 80 17 33                  Email: mel@rexroth.com.au</p>
<p>Brazil <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth                  Automação Ltda.                  Divisão Rexroth Indramat                  Rua Georg Rexroth, 609                  Vila Padre Anchieta                  BR - 09951-270 Diadema-SP                  [ Caixa Postal 377 ]                  [ BR-09901-970 Diadema-SP ]</p> <p>Telefon: +55 (0)11/745 90 60                  +55 (0)11/745 90 70                  Telefax: +55 (0)11/745 90 50                  e-mail: awittwer@rexroth.com.br</p>	<p>Brazil <input type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth                  Automação Ltda.                  Divisão Rexroth Indramat                  R. Dr.Humberto Pinheiro Vieira, 100                  Distrito Industrial                  BR - 89220-390 Joinville - SC                  [ Caixa Postal 1273 ]</p> <p>Tel./Fax: +55 (0)47/473 58 33                  Mobil: +55 (0)47 974 66 45                  e-mail: prochnow@zaz.com.br</p>	<p>Canada <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Basic Technologies Corporation                  Burlington Division                  3426 Mainway Drive                  Burlington, Ontario                  Canada L7M 1A8</p> <p>Telefon: +1 905/335 55 11                  Telefax: +1 905/335-41 84</p>	<p>China <input type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth (China) Ltd.                  Shanghai Parts &amp; Service Center                  199 Wu Cao Road, Hua Cao                  Minhang District                  PRC - Shanghai 201 103</p> <p>Telefon: +86 21/62 20 00 58                  Telefax: +86 21/62 20 00 68</p>
<p>China <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth (China) Ltd.                  15/F China World Trade Center                  1, Jianguomenwai Avenue                  PRC - Beijing 100004</p> <p>Telefon: +86 10/65 05 03 80                  Telefax: +86 10/65 05 03 79</p>	<p>China <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth (China) Ltd.                  A-5F., 123 Lian Shan Street                  Sha He Kou District                  PRC - Dalian 116 023</p> <p>Telefon: +86 411/46 78 930                  Telefax: +86 411/46 78 932</p>	<p>Hongkong <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Rexroth (China) Ltd.                  1/F., 19 Cheung Shun Street                  Cheung Sha Wan,                  Kowloon, Hongkong</p> <p>Telefon: +852 22 62 51 00                  Telefax: +852 27 44 02 78</p>	<p>India <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth (India) Ltd.                  Rexroth Indramat Division                  Plot. 96, Phase III                  Peenya Industrial Area                  IND - Bangalore - 560058</p> <p>Telefon: +91 (0)80/8 39 73 74                  Telefax: +91 (0)80/8 39 43 45</p>
<p>India <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth (India) Ltd.                  Rexroth Indramat Division                  Plot. A-58, TTC Industrial Area                  Thane Turbhe Midc Road                  Mahape Village                  IND - Navi Mumbai - 400 701</p> <p>Telefon: +91 (0)22/7 61 46 22                  Telefax: +91 (0)22/7 68 15 31</p>	<p>Indonesia <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>PT. Rexroth Wijayakusuma                  Jl. Raya Bekasi Km 21                  Pulogadung                  RI - Jakarta Timur 13920</p> <p>Telefon: +62 21/4 61 04 87                  +62 21/4 61 04 88                  Telefax: +62 21/4 60 01 52</p>	<p>Japan <input type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Rexroth Automation Co., Ltd.                  Service Center Japan                  Yutakagaoka 1810, Meito-ku,                  NAGOYA 465-0035, Japan</p> <p>Telefon: +81 (0)52/777 88 41                  +81 (0)52/777 88 53                  +81 (0)52/777 88 79                  Telefax: +81 (0)52/777 89 01</p>	<p>Japan <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Rexroth Automation Co., Ltd.                  Rexroth Indramat Division                  1F, I.R. Building                  Nakamachidai 4-26-44, Tsuzuki-ku                  YOKOHAMA 224-0041, Japan</p> <p>Telefon: +81 (0)45/942 72 10                  Telefax: +81 (0)45/942 03 41</p>
<p>Mexico <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth Mexico S.A.                  de C.V.                  Calle Neptuno 72                  Unidad Ind. Vallejo                  MEX - 07700 Mexico, D.F.</p> <p>Telefon: +52 5 754 17 11                  +52 5 754 36 84                  +52 5 754 12 60                  Telefax: +52 5 754 50 73                  +52 5 752 59 43                  e-mail: gsoria@rexroth-mexico.com</p>	<p>Korea <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth-Seki Co Ltd.                  1500-12 Da-Dae-Dong                  ROK - Saha-Ku, Pusan, 604-050</p> <p>Telefon: +82 (0)51/2 60 06 18                  Telefax: +82 (0)51/2 60 06 19</p>	<p>Korea <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>Seo Chang Corporation Ltd.                  Room 903, Jail Building                  44-35 Yeouido-Dong                  Yeoungdeungpo-Ku                  C.P.O.Box 97 56                  ROK - Seoul</p> <p>Telefon: +82 (0)2/7 80 82 08                  +82 (0)2/7 80 82 09                  Telefax: +82 (0)2/7 84 54 08</p>	<p>South Africa <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service</p> <p>TECTRA Automation (Pty) Ltd.                  28 Banfield Road, Industria North                  RSA - Maraisburg 1700</p> <p>Telefon: +27 (0)11/673 20 80                  Telefax: +27 (0)11/673 72 69</p>
<p>Taiwan <input checked="" type="checkbox"/> SALES <input type="checkbox"/> Service</p> <p>Rexroth Uchida Co., Ltd.                  No.1, Tsu Chiang Street                  Tu Cheng Ind. Estate                  Taipei Hsien, Taiwan, R.O.C.</p> <p>Telefon: +886 2/2 68 13 47                  Telefax: +886 2/2 68 53 88</p>			

Kundenbetreuungsstellen außerhalb Europa - Service agencies outside Europe

**Außerhalb Europa / USA - outside Europe / USA**

USA <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service Mannesmann Rexroth Corporation Rexroth Indramat Division 5150 Prairie Stone Parkway USA -Hoffman Estates, IL 60192-3707 Telefon: +1 847/6 45 36 00 Telefax: +1 847/6 45 62 01 service@indramat.com	USA <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service Mannesmann Rexroth Corporation Rexroth Indramat Division Central Region Technical Center USA - Auburn Hills, MI 48326 Telefon: +1 248/3 93 33 30 Telefax: +1 248/3 93 29 06	USA <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service Mannesmann Rexroth Corporation Rexroth Indramat Division Southeastern Technical Center 3625 Swiftwater Park Drive USA - Suwanee Georgia 30174 Telefon: +1 770/9 32 32 00 +1 770/9 32 19 03	USA <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service Mannesmann Rexroth Corporation Rexroth Indramat Division Northeastern Technical Center 99 Rainbow Road USA - East Granby, Connecticut 06026 Telefon: +1 860/8 44 83 77 +1 860/8 44 85 95
USA <input checked="" type="checkbox"/> SALES <input checked="" type="checkbox"/> Service Mannesmann Rexroth Corporation Rexroth Indramat Division Charlotte Regional Sales Office 14001 South Lakes Drive USA - Charlotte, North Carolina 28273 Telefon: +1 704/5 83 97 62 +1 704/5 83 14 86			USA Service HOTLINE  <b>+1-800-860-1055</b>  - 7 days / 24hrs -

Kundenbetreuungsstellen außerhalb Europa / USA  
 Service agencies outside Europe / USA





284044

Printed in Germany