



MT-CNC Setup Registers for Spindle and Feed Axes

Applikation Manual

DOK-MT*CNC-EINREG**V15-ANW1-EN-P

- Title** Setup Registers for Spindle and Feed Axes
- Kind of Document** Application Manual
- Docu-Type** DOK-MT*CNC-EINREG**V15-ANW1-EN-E1,44
- Internal Filing Remarks**
- Mapped 5
 - M507162E.pdf
 - Drawing No. 109-0768-4162-00 EN/09.95
- Purpose of this Document**
- This document describes the setting and the use of 'Setup Registers for Spindle and Feed Axes
- Reference** This electronic document is based on the hardcopy document with document design.: DOK-MT*CNC-EINREG**V15-ANW1-EN-P

Record of Revisions

Revision	Date	Remarks
109-0768-4162-00	1096	Initial Release
DOK-MT*CNC-EINREG**V15-ANW1-EN-E1,44	07.97	1st E-Dok

Copyright © INDRAMAT GmbH, 1996

Copying this document, and 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).

The electronic documentation (E-doc) may be copied as often as needed if such are to be used by the customer for the purpose intended.

Published by INDRAMAT GmbH • Bgm.-Dr.-Nebel-Str. 2 • D-97816 Lohr a. Main
Phone 09352/40-0 • Tx 689421 • Fax 09352/40-4885

ENC (GL)

Table of Contents

1 Introduction	1-2
2 Functionality	2-1
2.1 Setup Registers for Spindles.....	2-1
Spindle Jog Speed	2-1
Jog Rapid Speed	2-1
Jog Spindle Position	2-2
2.2 Setup Registers for Feed Axes	2-2
Jog Velocity	2-2
Jog Velocity Rapid.....	2-3
Jog Distance.....	2-3
2.3 Activation of Setup Registers for Spindles and Feed Axes	2-4
2.4 Special Characteristics.....	2-4
3 Interface Signals, Position and Velocity Data for Jog Functions	3-1
3.1 Spindles.....	3-1
3.2 Feed Axes	3-2
4 Gateway Signal 'Rapid jog' with spindles	4-1
5 Index	5-1

1 Introduction

Setup registers The following setup registers are available for spindles and feed axes in the Machine Data (MUI menu item #3, ONLINE mode only):

Setup registers for spindles	Setup registers for feed axes
Jog speed	Jog velocity
Jog rapid speed	Jog rapid velocity
Jog spindle position	Variable jog distance

These registers make it easier for the operator to clamp/unclamp and inspect workpieces, tools and fixtures in the setup mode. In the manual mode, the user can change the registers directly via the user interface (MUI) or indirectly via the programmable controller (SPS) using (Machine) keys via the FUNCTION_BLOCK MTD_WR.

2 Functionality

2.1 Setup Registers for Spindles

Spindle Jog Speed

Name	Jog speed (Machine Data PAGE 1, element 001)
Purpose	The 'jog speed' is used in manual mode as the rpm for continuous operation (AxxC.M3 / AxxC.M4: 0→1 and AxxC.RAPID = 0) and for continuous and incremental jog.
Unit	[rpm]
Requirements	<ul style="list-style-type: none"> • The 'MANUAL' mode (setup) must be active. • The axis must be ready (AxxC.READY = 1) and controller enable must be active (AxxS.RF = 1). • Axis enable is active (AxxC.ENABL = 1). • Motion hold is inactive (AxxC.MHOLD = 0). • The spindle specific RAPID input is not set (AxxC.RAPID = 0). • The SPS does not simultaneously set a spindle counterclockwise / clockwise, spindle stop or spindle positioning command in addition to the spindle counterclockwise/clockwise operation command.
<hr/>	
Instruction:	The process specific PxxC.RAPID input does <u>not</u> affect spindles.
<hr/>	

Jog Rapid Speed

Name	Jog speed rapid (Machine Data PAGE 1, element 002)
Purpose	The 'jog speed rapid' is used in manual mode as the rapid rpm for continuous operation (AxxC.M3 /AxxC.M4: 1→1 and AxxC.RAPID = 0) and for continuous and incremental jog.
Unit	[rpm]
Requirements	<ul style="list-style-type: none"> • The 'MANUAL' mode (setup) must be active. • The axis is ready (AxxC.READY = 1) and controller enable is active (AxxS.RF = 1). • Axis enable is active (AxxC.ENABL = 1). • Motion hold is inactive (AxxC.MHOLD = 0). • The spindle specific RAPID input is set (AxxC.RAPID = 1). • The SPS does not simultaneously set a spindle counterclockwise/ clockwise, spindle stop or spindle positioning command in addition to the spindle counterclockwise/clockwise operation command.
<hr/>	
Instruction:	The process specific PxxC.RAPID input does <u>not</u> affect spindles.
<hr/>	

Jog Spindle Position

Name	Spindle position M19 (Machine Data PAGE 1, element 003)
Purpose	'Spindle position M19' is used in manual mode to position the spindle (AxxC.M19: 0→1).
Unit	[°]
Requirements	<ul style="list-style-type: none"> • The 'MANUAL' mode (setup) must be active. • The axis is ready (AxxC.READY = 1) and controller enable is active (AxxS.RF = 1). • Axis enable is active (AxxC.ENABL = 1). • Motion hold is inactive (AxxC.MHOLD = 0). • The SPS does not simultaneously set a spindle counterclockwise/clockwise or spindle stop command in addition to the spindle positioning command.
<hr/>	
Instruction:	<p>With analog spindles, positioning is performed at the 'Orient Speed' (Cxx.051) set in the axis parameters. However with digital spindles, the drive automatically performs positioning using the positioning speed which is programmed in the SERCOS parameter 'Spindle positioning speed' (S-0-0222).</p>
<hr/>	

2.2 Setup Registers for Feed Axes

Jog Velocity

Name	Jog velocity (Machine Data PAGE 10, element 001)
Purpose	The NC uses the 'jog velocity' in incremental mode when an axis is jogged continuously and incrementally.
Unit	Linear axes: [mm/min] or [inch/min] Rotary axes: [units/min]
Requirements	<ul style="list-style-type: none"> • The 'MANUAL' mode (setup) must be active. • The axis is ready (AxxC.READY = 1) and controller enable is active (AxxS.RF = 1). • Axis enable is active (AxxC.ENABL = 1). • Motion hold is inactive (AxxC.MHOLD = 0). • The process specific RAPID input is not set (PxxC.RAPID = 0).
<hr/>	
Instruction:	<p>The axis specific AxxC.RAPID input <u>does not affect</u> feed axes (axes meanings in Cartesian Coordinate System: X, Y, Z, U, V, W, A, B, C).</p>
<hr/>	

Jog Velocity Rapid

Name	Jog velocity rapid (Machine Data PAGE 10, element 002)
Purpose	The NC uses the 'jog velocity rapid' in manual mode when an axis is jogged continuously and incrementally.
Unit	Linear axes: [mm/min] or [inch/min] rotary axes: [units/min]
Requirements	<ul style="list-style-type: none"> • The 'MANUAL' mode (setup) must be active. • The axis is ready (AxxC.READY = 1) and controller enable is active (AxxS.RF = 1). • Axis enable is active (AxxC.ENABL = 1). • Motion hold is inactive (AxxC.MHOLD = 0). • The process specific RAPID input is set (PxxC.RAPID = 0).
<hr/>	
Instruction:	The axis specific AxxC.RAPID input <u>does not affect feed axes</u> (axes meanings in Cartesian Coordinate System: X, Y, Z, U, V, W, A, B, C).
<hr/>	

Jog Distance

Name	Jog distance (Machine Data PAGE 10, element 003)
Purpose	'Jog distance' is used in manual mode to specify a given distance for the NC to traverse upon incremental jogging using the variable jog distance (AxxC.JGPOS/AxxC.JGNEG): 0→1, PxxC.JOGM0 = PxxC.JOGM1 = PxxC.JOGM2 = 1).
Unit	Linear axes: [mm] or [inch] Rotary axes: [units]
Requirements	<ul style="list-style-type: none"> • The 'MANUAL' mode (setup) must be active. • The axis is ready (AxxC.READY = 1) and controller enable is active (AxxS.RF = 1). • Axis enable is active (AxxC.ENABL = 1). • Motion hold is inactive (AxxC.MHOLD = 0). • Incremental jogging using the variable jog distance is set (PxxC.JOGM0 = PxxC.JOGM1 = PxxC.JOGM2 = 1).
<hr/>	
Instruction:	When jogging incrementally using the 'jog distance', the NC traverses the axes dependent on the process specific PxxC.RAPID input using the jog velocity or the jog rapid velocity.
<hr/>	

2.3 Activation of Setup Registers for Spindles and Feed Axes

Activation The NC does not use the setup registers of a spindle until the corresponding speeds and positions are entered in the machine data **PAGE 1**. Correspondingly, the NC does not use the setup registers of a feed axis until the corresponding speeds and distances are entered in the machine data **PAGE 10**.

Instruction: If the user assigns a value of '0' to the 'jog velocity,' the 'jog velocity rapid' or the 'jog distance,' the NC uses the corresponding value from the axis parameters instead of the setup register when traversing the axis. Similarly, with spindles the NC takes the corresponding values from the axis parameters if the 'jog speed' or 'jog speed rapid' is set to '0'. The NC does not take the 'spindle position M19' from the axis parameters unless both jog speed registers for the respective spindle are set to values not equal to '0'.

2.4 Special Characteristics

Tool storage axis	With NC-controlled tool storage units, the NC ignores the 'jog distance' in the machine data. With incremental jog, it traverses the tool storage axis from position to position using the 'Parametric Jogging Distance' (Cxx.022) from the axis parameters.
Handwheel	If the SPS selects incremental jog with 'parametric jog distance' (PxxC.JOGM0 = PxxC.JOGM1 = PxxC.JOGM2 = 1) during handwheel mode using the jog mode signals, the NC scales the divisions on the handwheel using the 'parametric jogging distance' stored in the axis parameters (Cxx.022) divided by 100 (parametric jog distance per handwheel revolution).
Incremental jogging of spindles	If spindles are traversed via incremental jog with 'parametric jogging distance,' the NC traverses to the position stored in the setup register named 'spindle position M19' when the interface signal AxxC.JGPOS) is active. The NC traverses to the negative position when the negative interface signal 'AxxC.JNEG' is activated.
Rotary (C-)axis capable spindles	In spindle mode, rotary capable spindles have all the spindle specific functions, and in the rotary (C-)axis mode, they have all the functions of a feed axis.



WARNING

⇒ Before changing the process parameters 'Default System of Units for Programming' (G70 [inch] / G71 [mm], Bxx.001) and 'Programmable (trailing) Decimal Places for Distances' (Bxx.002), the active Machine Data in the NC must be loaded to the PC (backed up via §+– in MUI menu item #1). The Machine Data registers must be loaded back into the control (via – in MUI menu item #1) after the parameters have been changed and were loaded into the control.

It is absolutely essential to check whether the corresponding Machine Data values were converted correctly!

3 Interface Signals, Position and Velocity Data for Jog Functions

3.1 Spindles

Function	Gateway Signals									Machine Parameters	Machine Data PAGE 1
	A x x C J G P O S / N E G	P x x C J O G M 2	P x x C J O G M 1	P x x C J O G M 0	P x x C R A P I D	A x x C M 3/ M 4	A x x C M 1 9	A x x C R A P I D			
Spindle- continuous operation	-	-	-	-	-			0	-	Jog speed (element 001)	
	-	-	-	-	-	√		1	-	Jog speed rapid (element 002)	
Position spindle	-	-	-	-	-		√	0	Digital spindle: SERCOS parameter 'Spindle positioning speed' (S-0-0222) Analog spindle: Axis parameter 'Orient Speed' (Cxx.051)	Spindle position M19 (element 003)	

The distance which corresponds to an output unit 'OU' is shown in the following table:

Process Parameter 'Programmable (trailing) Decimal Places for Distances' (Bxx.002)	1 OU corresponds to	Unit
4	0.1	Degrees
5	0.01	

3.2 Feed Axes

Function	Gateway Signals					Machine Parameters			Machine Data PAGE 10	
	A X X C J G P O S / N E G	P X X C J O G M 2	P X X C J O G M 1	P X X C J O G M 0	P X X C R A P I D	A X X C M 3 / M 4	A X X C M 1 9	A X X C R A P I D		
Continuous jog	1	0	0	0	0	-	-	-	Jog velocity (element 001)	
	1	0	0	0	1	-	-	-	Jog velocity rapid (element 002)	
Incremental jog	┌ └ ┌ └ ┌ └ ┌ └	0 0 0 1 1 1 1	0 1 1 0 0 1 1	1 0 1 0 0 1 1	0 0 0 0 0 0 0	- - - - - - -	- - - - - - -	- - - - - - -	1 OU, 'feed velocity jog' (axis parameters) 10 OU, 'feed velocity jog' (axis parameters) 100 OU, 'feed velocity jog' (axis parameters) 1000 OU, 'feed velocity jog' (axis parameters) 10000 OU, 'feed velocity jog' (axis parameters) 100000 OU, 'feed velocity jog' (axis paramet.)	Jog distance (element 003)
	┌ └ ┌ └ ┌ └ ┌ └	0 0 0 1 1 1 1	0 1 1 0 0 1 1	1 0 1 1 1 0 1	1 1 1 1 1 1 1	- - - - - - -	- - - - - - -	- - - - - - -	1 OU, 'rapid velocity jog' (axis parameters) 10 OU, 'rapid velocity jog' (axis parameters) 100 OU, 'rapid velocity jog' (axis parameters) 1000 OU, 'rapid velocity jog' (axis parameters) 10000 OU, 'rapid velocity jog' (axis paramet.) 100000 OU, 'rapid velocity jog' (axis paramet.)	Jog distance

The distance which corresponds to output unit 'OU' is shown in the following table:

Process Parameter 'Programmable (trailing) Decimal Places for Distances' (Bxx.002)	1 OU corresponds to	Unit
4	0.0001	Linear axis: mm or inch
5	0.00001	Rotary axis: units

4 Gateway Signal 'Rapid jog' with spindles

Name	AxxC.RAPID
Purpose	Using the axis specific control signal 'AxxC.RAPID,' the 'jog speed' or the 'jog speed rapid' can be selected for continuous spindle operation and for continuous or incremental jogging.
Meaning	<p>AxxC.RAPID = 0: In continuous spindle operation (AxxC.M3 / AxxC.M4: 0→1) as well is in continuous and incremental jogging, the NC traverses the spindle at jog speed.</p> <p>AxxC.RAPID = 1: In continuous spindle operation (AxxC.M3 / AxxC.M4: 0→1) as well is in continuous and incremental jogging, the NC traverses the spindle at jog speed rapid.</p> <hr/> <p>Instruction: The NC only uses the axis specific control signal 'rapid jog' (AxxC.RAPID) only with spindles and the process specific control signal 'rapid traverse' only for feed axes (having axis meanings in Cartesian Coordinate System: X, Y, Z, U, V, W, A, B, C).</p> <hr/>

5 Index

A	
Activation of setup registers for feed axes	2-6
Activation of setup registers for spindles	2-6
AxxC.RAPID	4-1
B	
Bxx.001	2-6
Bxx.002	2-6; 3-7; 3-8
C	
Continuous jog	3-8
Cxx.051	2-4; 3-7
D	
Default System of Units for Programming	2-6
F	
FUNCTION_BLOCK MTD_WR	1-2
G	
Gateway signals	
Spindles	3-7
H	
Handwheel	2-6
I	
Incremental jog	3-8
Incremental jogging of spindles	2-6
Interface signals, position and velocity data for jog functions	3-7
Feed axes	3-8
M	
Machine Data PAGE 1	2-6
Machine Data PAGE 1, element 001	2-3
Machine Data PAGE 1, element 002	2-3
Machine Data PAGE 1, element 003	2-4
Machine Data PAGE 10	2-6
Machine Data PAGE 10, element 001	2-4
Machine Data PAGE 10, element 002	2-5
Machine Data PAGE 10, element 003	2-5
Machine Data, MT-CNC → PC	2-6

Machine Data, MUI menu	1-2
Machine Data, PAGE 10	3-8
Machine Data, PC → MT-CNC	2-6
Machine Parameters	3-8
O	
Orient Speed	2-4
P	
Position and velocity data for jog functions	
Spindles	3-7
Programmable (trailing) Decimal Places for Distances	2-6
R	
Rotary (C-)axis-capable spindles	2-6
S	
S-0-0222	2-4; 3-7
Setup registers for feed axes	1-2; 2-4
Jog distance	2-5
Jog velocity	2-4
Jog velocity rapid	2-5
Setup registers for spindles	2-3
Jog speed	2-3
Jog speed rapid	2-3
Spindle position M19	2-4
Spindle positioning speed	2-4
SPS	1-2
T	
Tool storage axis	2-6

Customer Service

Germany

Vertriebsgebiet Mitte INDRAMAT GmbH D-97816 Lohr am Main Bgm.-Dr.-Nebel-Str. 2 Telefon: 09352/40-0 Telefax: 09352/40-4885	Vertriebsgebiet Ost INDRAMAT GmbH D-09120 Chemnitz Beckerstraße 31 Telefon: 0371/3555-0 Telefax: 0371/3555-230	Vertriebsgebiet West INDRAMAT GmbH D-40849 Ratingen Hansastraße 25 Telefon: 02102/4318-0 Telefax: 02102/41315	Vertriebsgebiet Nord INDRAMAT GmbH D-22085 Hamburg Fährhausstraße 11 Telefon: 040/227126-16 Telefax: 040/227126-15
Vertriebsgebiet Süd INDRAMAT GmbH D-80339 München Ridlerstraße 75 Telefon: 089/540138-30 Telefax: 089/540138-10	Vertriebsgebiet Südwest INDRAMAT GmbH D-71229 Leonberg Böblinger Straße 25 Telefon: 07152/972-6 Telefax: 07152/972-727		INDRAMAT Service-Hotline INDRAMAT GmbH Telefon: D-0172/660 040 6 -oder- Telefon: D-0171/333 882 6

Customer Service in Germany

Europe

Austria G.L.Rexroth Ges.m.b.H. Geschäftsbereich INDRAMAT A-1140 Wien Hägelegasse 3 Telefon: 1/9852540-400 Telefax: 1/9852540-93	Austria G.L.Rexroth Ges.m.b.H. Geschäftsbereich INDRAMAT A-4061 Pasching Randlstraße 14 Telefon: 07229/4401-36 Telefax: 07229/4401-80	Belgium Mannesmann Rexroth N.V.-S.A. Geschäftsbereich INDRAMAT B-1740 Ternat Industrielaan 8 Telefon: 02/5823180 Telefax: 02/5824310	Denmark BEC Elektronik AS DK-8900 Randers Zinkvej 6 Telefon: 086/447866 Telefax: 086/447160
England Mannesmann Rexroth Ltd. INDRAMAT Division Cirencester, Glos GL7 1YG 4 Esland Place, Love Lane Telefon: 01285/658671 Telefax: 01285/654991	Finnland Rexroth Mecman OY SF-01720 Vantaa Riihimiehentie 3 Telefon: 0/848511 Telefax: 0/846387	France Rexroth - Sigma S.A. Division INDRAMAT F-92632 Gennevilliers Cedex Parc des Barbanniers 4, Place du Village Telefon: 1/41475430 Telefax: 1/47946941	France Rexroth - Sigma S.A. Division INDRAMAT F-69634 Venissieux - Cx 91, Bd 1 Joliot Curie Telefon: 78785256 Telefax: 78785231
France Rexroth - Sigma S.A. Division INDRAMAT F-31100 Toulouse 270, Avenue de l'ardenne Telefon: 61499519 Telefax: 61310041	Italy Rexroth S.p.A. Divisione INDRAMAT I-20063 Cernusco S/N.MI Via G. Di Vittoria, 1 Telefon: 02/92365-270 Telefax: 02/92108069	Italy Rexroth S.p.A. Divisione INDRAMAT Via Borgomanero, 11 I-10145 Torino Telefon: 011/7712230 Telefax: 011/7710190	Netherlands Hydraudyne Hydrauliek B.V. Kruisbroeksestraat 1a P.O. Box 32 NL-5280 AA Boxtel Telefon: 04116/51951 Telefax: 04116/51483
Spain Rexroth S.A. Centro Industrial Santiago Obradors s/n E-08130 Santa Perpetua de Mogoda (Barcelona) Telefon: 03/718 68 51 Telex: 591 81 Telefax: 03/718 98 62	Spain Goimendi S.A. División Indramat Jolastokieta (Herrera) Apartado 11 37 San Sebastian, 20017 Telefon: 043/40 01 63 Telex: 361 72 Telefax: 043/39 93 95	Sweden AB Rexroth Mecman INDRAMAT Division Varuvägen 7 S-125 81 Stockholm Telefon: 08/727 92 00 Telefax: 08/64 73 277	Switzerland Rexroth SA Département INDRAMAT Chemin de l'Ecole 6 CH-1036 Sullens Telefon: 021/731 43 77 Telefax: 021/731 46 78
Switzerland Rexroth AG Geeschäftsbereich INDRAMAT Gewerbestraße 3 CH-8500 Frauenfeld Telefon: 052/720 21 00 Telefax: 052/720 21 11	Russia Tschudnenko E.B. Arsenia 22 153000 Ivanovo Rußland Telefon: 093/22 39 633		

Customer Service in Europe

Outside of Europe

<p>Argentina</p> <p>Mannesmann Rexroth S.A.I.C. Division INDRAMAT Acassuso 48 41/7 1605 Munro (Buenos Aires) Argentina</p> <p>Telefon: 01/756 01 40 01/756 02 40 Telex: 262 66 rexro ar Telefax: 01/756 01 36</p>	<p>Argentina</p> <p>Nakase Asesoramiento Tecnico Diaz Velez 2929 1636 Olivos (Provincia de Buenos Aires) Argentina Argentina</p> <p>Telefon 01/790 52 30</p>	<p>Australia</p> <p>Australian Industrial Machinery Services Pty. Ltd. Unit 3/45 Horne ST Campbellfield VIC 2061 Australia</p> <p>Telefon: 03/93 59 0228 Telefax: 03/93 59 02886</p>	<p>Brazil</p> <p>Mannesmann Rexroth Automação Ltda. Divisão INDRAMAT Rua Georg Rexroth, 609 Vila Padre Anchieta BR-09.951-250 Diadema-SP Caixa Postal 377 BR-09.901-970 Diadema-SP</p> <p>Telefon: 011/745 90 65 011/745 90 70 Telefax: 011/745 90 50</p>
<p>Canada</p> <p>Basic Technologies Corporation Burlington Division 3426 Mainway Drive Burlington, Ontario Canada L7M 1A8</p> <p>Telefon: 905/335-55 11 Telefax: 905/335-41 84</p>	<p>China</p> <p>Rexroth (China) Ltd. Shanghai Office Room 206 Shanghai Intern. Trade Centre 2200 Yanan Xi Lu Shanghai 200335 P.R. China</p> <p>Telefon: 021/627 55 333 Telefax: 021/627 55 666</p>	<p>China</p> <p>Rexroth (China) Ltd. Shanghai Parts & Service Centre 199 Wu Cao Road, Hua Cao Minhang District Shanghai 201 103 P.R. China</p> <p>Telefon: 021/622 00 058 Telefax: 021/622 00 068</p>	<p>China</p> <p>Rexroth (China) Ltd. 1430 China World Trade Centre 1, Jianguomenwai Avenue Beijing 100004 P.R. China</p> <p>Telefon: 010/50 50 380 Telefax: 010/50 50 379</p>
<p>China</p> <p>Rexroth (China) Ltd. A-5F., 123 Lian Shan Street Sha He Kou District Dalian 116 023 P.R. China</p> <p>Telefon: 0411/46 78 930 Telefax: 0411/46 78 932</p>	<p>Honkong</p> <p>Rexroth (China) Ltd. 19 Cheung Shun Street 1st Floor, Cheung Sha Wan, Kowloon, Honkong</p> <p>Telefon: 741 13 51/-54 und 741 14 30 Telex: 3346 17 GL REX HX Telefax: 786 40 19 786 07 33</p>	<p>India</p> <p>Mannesmann Rexroth (India) Ltd. INDRAMAT Division Plot. 96, Phase III Peenya Industrial Area Bangalore - 560058</p> <p>Telefon: 80/839 21 01 80/839 73 74 Telex: 845 5028 RexB Telefax: 80/839 43 45</p>	<p>Japan</p> <p>Rexroth Co., Ltd. INDRAMAT Division I.R. Building Nakamachidai 4-26-44 Tsuzuki-ku, Yokohama 226 Japan</p> <p>Telefon: 045/942-72 10 Telefax: 045/942-03 41</p>
<p>Korea</p> <p>Rexroth-Seki Co Ltd. 1500-12 Da-Dae-Dong Saha-Gu, Pusan, 604-050</p> <p>Telefon: 051/264 90 01 Telefax: 051/264 90 10</p>	<p>Korea</p> <p>Seo Chang Corporation Ltd. Room 903, Jeail Building 44-35 Yoido-Dong Youngdeungpo-Ku Seoul, Korea</p> <p>Telefon: 02/780-82 07 -9 Telefax: 02/784-54 08</p>	<p>Mexico</p> <p>Motorización y Diseño de Controles, S.A. de C.V. Av. Dr. Gustavo Baz No. 288 Col. Parque Industrial la loma Apartado Postal No. 318 54060 Tlalnepantla Estado de Mexico</p> <p>Telefon: 5/397 86 44 Telefax: 5/398 98 88</p>	
<p>USA</p> <p>Rexroth Corporation INDRAMAT Division 5150 Prairie Stone Parkway Hoffman Estates, Illinois 60192</p> <p>Telefon: 847/645-36 00 Telefax: 857/645-62 01</p>	<p>USA</p> <p>Rexroth Corporation INDRAMAT Division 2110 Austin Avenue Rochester Hills, Michigan 48309</p> <p>Telefon: 810/853-82 90 Telefax: 810/853-82 90</p>		

Customer Service Outside of Europe

