

DIAX04

Drive With Servo Function, Analog- And Parallelinterface

Version Notes: ASE 02VRS

DOK-DIAX04-ASE-02VRS**-FVN1-EN-P

Titel	DIAX04 Drive With Servo Function, Analog- And Parallel Interface
Type of Documentation	Firmware-Version Notes FWA-DIAX04-ASE-02VRS-MS
Documentation code	DOK-DIAX04-ASE-02VRS**-FVN1-EN-P
Internal filing notation	<ul style="list-style-type: none"> • Mapped 63-02V-EN / Register 2 • Based on: ASE 02V • 209-0077-4345-01
What is the purpose of this documentation	<p>This documentation is a supplement to the function description DOK-DIAX04-ASE-02VRS**-FKB1-EN-P: DIAX04 Drive With Servo Function, Analog- and Parallel Interface.</p> <p>It describes the differences between FWA-DIAX04-ASE02VRS-MS and the previous firmware FWA-DIAX02-ASE-02VRS-MS</p>

Editing sequence

Document identification of previous and present editions	Release Date	Note
DOK-DIAX04-ASE-02VRS**-FVN1-EN-P	07.98	first release

Copyright	<p>© INDRAMAT GmbH, 1998</p> <p>Transmission as well as reproduction of this documentation, commercial use or communication of its contents will not be permitted without expressed written permission. Violation of these stipulations will require compensation. All rights reserved for the ensurance of the patent or registered design. (DIN 34-1)</p>
Liability	Changes in the content of the documentation and the delivery possibilities of the products are reserved
Publisher	<p>INDRAMAT GmbH • Bgm.-Dr.-Nebel-Str. 2 • D-97816 Lohr a. Main</p> <p>Telephone 09352/40-0 • Tx 689421 • Fax 09352/40-4885</p> <p>Abt. ECD (AO/OS)</p>
Note	This document is printed on chlorine-free bleached paper.

Contents

1 General Information	1-1
1.1 Product Family	1-1
1.2 Documentation	1-1
1.3 Notes on Replacing the Firmware.....	1-2
2 Version Notes FWA-DIAX04-ASE-02VRS-MS	2-1
2.1 Release notes	2-1
2.2 Checksums	2-1
2.3 Expanded/Changed Functions.....	2-2
Language selection	2-2
Parametrizing and commissioning with DRIVETOP	2-2
Serial communications via RS232 or RS485	2-2
Structure of Parameters and commands	2-2
Diagnoses: Errors and warnings	2-3
Operating modes.....	2-3
Command communication with analog interface	2-4
Motor types that can be used	2-4
Display format for state variables.....	2-4
Encoder emulation: Position return	2-5
Drive monitoring	2-5
Analog output	2-5
Analog input	2-5
Velocity controller	2-5
2.4 New functions.....	2-7
Operating mode: Positioning block	2-7
Drive-controlled referencing	2-7
Dynamic cam switch group	2-7
Command load base parameters.....	2-7
Error memory and operating hours counter	2-7
Digital inputs.....	2-8
Drive error reactions.....	2-8
Evaluation of an optional encoder	2-8
Password.....	2-8

Notes

1 General Information

1.1 Product Family

The product release description refers to the product family:

<p>DIAX04 Drive with Servofunction, Analog- and Parallel Interface FWA-DIAX04-ASE-02VRS-MS</p>
--

The following drive controls can be operated with this software:

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

1.2 Documentation

The documentation for product **FWA-DIAX04-ASE-02VRS** is available as follows:

- Paper form
- Windows help system

The following table contains a summary of available items.

POS	Type	Document style	Register in Mappe	Part number	Symbol number
1	DOK-DIAX04-ASE-02VRS**-63M1-EN-P	M63-02-EN	--	280447	209-0077-4341-01
2	DOK-DIAX04-ASE-02VRS**-FKB1-EN-P	Functional Description	3	280448	209-0077-4342-01
3	DOK-DIAX04-ASE-02VRS**-INF1-EN-P	Drive Configuration	6	280449	209-0077-4343-01
4	DOK-DIAX04-ASE-02VRS**-WAR1-EN-P	Trouble Shooting Guide	8	280451	209-0077-4344-01
5	DOK-DIAX04-ASE-02VRS**-FVN1-EN-P	Firmware-Version Notes	2	280443	209-0077-4345-01
6	DOK-DIAX04-ASE-02VRS**-63M1-EN-H1,44	Gesamt-Hilfe-System Diskette	12	280444	209-0077-4341-01

Fig. 1-1: Documentation für FWA-DIAX04-ASE-02VRS

1.3 Notes on Replacing the Firmware

Note the following points before replacing the firmware:

- **Read documents completely**
- **Secure the current set of parameters**

Note: The parameters to be secured have been stored in parameter S-0-0192.

- **Switch machine off, replace the firmware of the drive controller (Eproms) and switch machine back on.**
- **Go into operating mode**
The machine with the new firmware is now operable.
- **Check the functions**
Check the functions carefully of the re-equipped machine.

2 Version Notes FWA-DIAX04-ASE-02VRS-MS

2.1 Release notes

Firmware version **FWA-DIAX04-ASE-02V01** represents the first official edition of version 02. It was released on

week 30 / 98

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

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

2.2 Checksums

Programm-Flash: 0201 h

Daten-Flash: 0201 h

Summe: 0402 h

2.3 Expanded/Changed Functions

Language selection

With the DIAX02, the user had the option of either German or English.

Today, the following languages for parameter names and units are available.

- German
- English
- French
- Spanish
- Italian

Parametrizing and commissioning with DRIVETOP

With the DIAX02 the parameter surface was stored together with the drive software in the drive.

To parametrize the drive, also known as communications via the serial interface, a compatible VT-100 terminal was needed or a computer that functioned as a terminal emulator, e.g., a DDS2PC, had to be used.

It is now possible to use DRIVETOP, a commissioning program which utilizes a PC. This is a Windows application which supports parametrization of the drive in a menu-controlled fashion.

The serial communications is limited to the exchange of parameter data.

See section:"Serial communications via RS232 or RS485"

Serial communications via RS232 or RS485

Communications via a serial interface can utilize either the RS232 or the RS485.

Note that cable combinations IKB003 and IDB005 must be used in conjunction with the RS232.

Note: Communications using the present interface cable IKS0392 is no longer possible.

Structure of Parameters and commands

The structure of a parameter and a command has been changed. It is now made up of seven (7) data block elements, viz.,

- ID number
- Name
- Attribute
- Unit
- Minimum value
- Maximum value
- Operating data

Only operating data was available (= parameter content) with the DIAX02.

Diagnoses: Errors and warnings

DIAX02 had fatal and non-fatal errors as well as warnings. An error number was displayed with an error, warnings flashed a warning number.

This has been changed to break warnings and errors down into classes and the drive's response, in turn, depends on these.

Warning class	Diagnosis	Drive reaction
with drive reaction of the drive	E8xx	error reaction
without drive reaction of the drive	E2xx	no reaction

Fig. 2-1: Warning classes

Error class	Diagnosis	Drive reaction
fatal	F8xx	goes torque free
travel range	F6xx	velocity command value goes to zero
interface	F4xx	best possible standstill
non-fatal	F2xx	best possible standstill

Fig. 2-2: Error classes

Operating modes

The DIAX02-ASE only had the operating modes torque control and velocity control.

The following modes are now possible:

- torque control
- velocity control
- drive-internal interpolation
- relative drive-internal interpolation
- positioning block mode
- jogging

Command communication with analog interface

The plug-in module DAE02.x is now used for command communication with analog interface.

It is equipped with more plug-in modules in addition to the DAE01.x or DAA01.x on connector X75 next to the inputs and outputs.

The connector was expanded from 10 to 14 pins for this purpose.

Inputs E2+, E2- (= 2. analog input), CLR (= clear error), STOP (= E-stop), FB+ and FB- (= travel range limit) were added.

This means that:

- a second analog input can be evaluated
- an error can be cleared via an external input
- an emergency (E-Stop) stop input is available
- travel range limit switches can be evaluated

The earthing input and the Ired-input have been eliminated.

The 15-pin D-subminiature connector X76, which is also on the DAE02.x module, is used either as the output for the incremental encoder emulator or the absolute encoder emulator.

The outputs are, in contrast to those on the DAE01.x and DAA01.x, are pin-compatible.

Motor types that can be used

The following types of motors can be used:

- MKD
- MKE
- MHE
- MHD/MDD
- 2AD
- 1MB
- ADF
- MBS
- LAF
- LAR
- LSF

Display format for state variables

With the help of various parameters the resolution with which position, velocity and acceleration are illustrated, can be selected.

It is possible, for example, to set the number of decimal places which the velocity command value (S-0-0036) may have. The relationship of these data can also be set. Motor and load relationships can also be depicted in modulo format.

Encoder emulation: Position return

Unchanged from the DIAX02, the functions incremental encoder and absolute encoder emulator are still available.

What has been added is the option of generating, via both emulators, not just the actual position value of the motor but also that of the external encoder and the position command value.

A switchable deadtime compensation has been utilized for the incremental encoder emulator also.

Drive monitoring

The DIAX02-ASE was only equipped with velocity control loop monitoring.

The DIAX03/04-ASE02 has velocity control loop and position control loop monitoring as well as a velocity limit value monitor.

The already mentioned travel range limit switches connected to the analog interface are also monitored.

A internal position limit value monitor has also been implemented.

The thermal monitor of the drive controller and motor has also been improved (monitor implements a temperature model).

Analog output

The "analog output" function can, in addition to the state variables known to the DIAX02-ASE, generate numerous additional variables as well as internal data contents.

Analog input

The "analog input" function has been completely revamped.

As mentioned under "analog command communications" it is now possible to evaluate two (2) analog input signals. Each of the two analog inputs is allocated a signal via parameters. These signals are processed analog.

The signal is selected from a predetermined list (e.g., torque command value, velocity command value and so on).

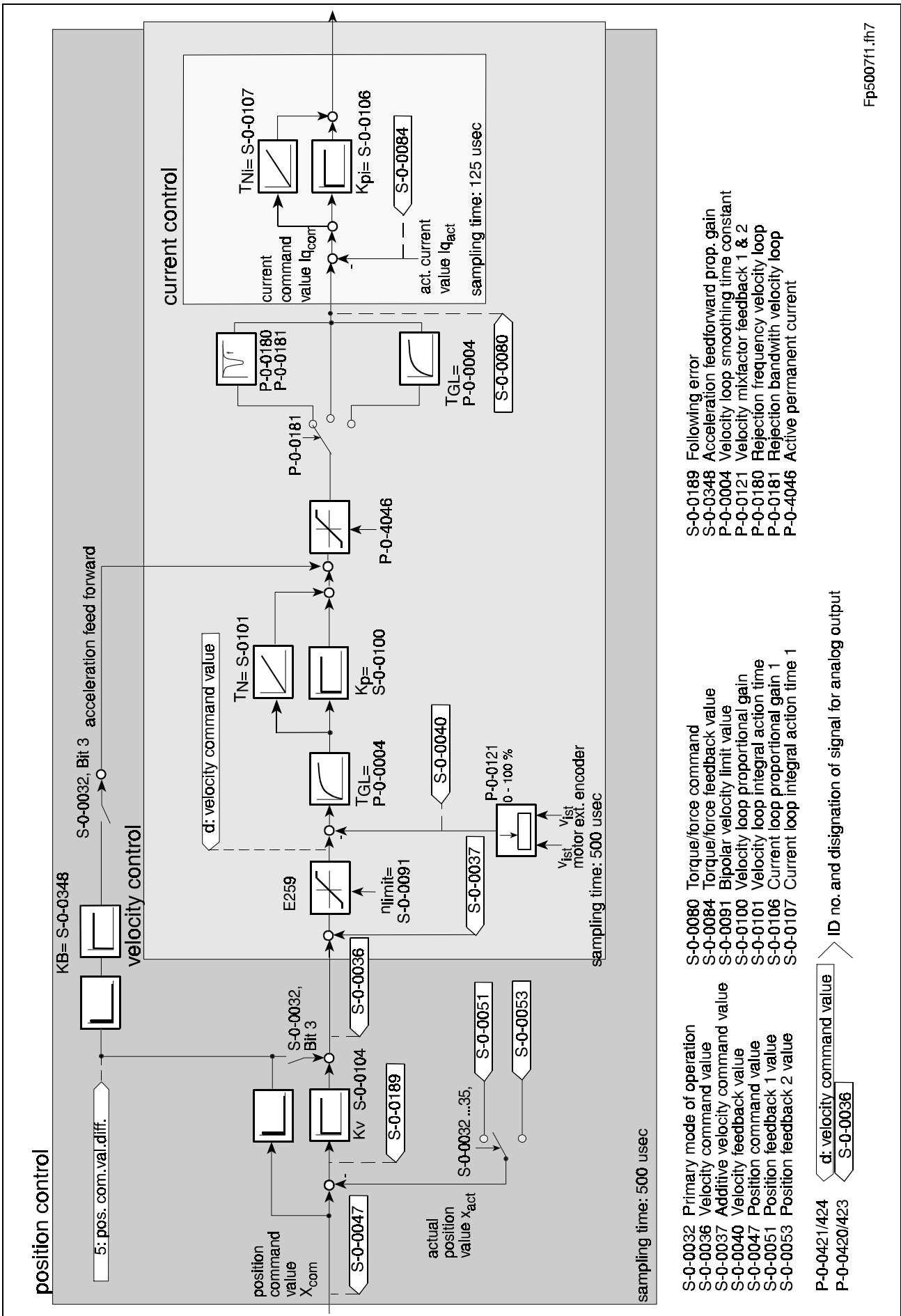
It should be noted that the first analog channel is evaluated in a 250 µsec cycle. The second has an 8 msec cycle.

Above and beyond this, each analog input has a parameter for setting the offset.

Velocity controller

The structure of the velocity controller has been slightly modified. It now has, in addition to a filter, a band-stop filter as well for the manipulated variables computed by the velocity controller.

See Fig. 2-3: Controller structure FWA-DIAX04-ASE-02VRS-MS.



Fp5007f1.fh7

Fig. 2-4: Controller structure FWA-DIAX04-ASE-02VRS-MS

- S-0-0189 Following error
- S-0-0348 Acceleration feedforward prop. gain
- P-0-0004 Velocity loop smoothing time constant
- P-0-0121 Velocity mixfactor feedback 1 & 2
- P-0-0180 Rejection frequency velocity loop
- P-0-0181 Rejection bandwidth velocity loop
- P-0-4046 Active permanent current

- S-0-0080 Torque/force command
- S-0-0084 Torque/force feedback value
- S-0-0091 Bipolar velocity limit value
- S-0-0100 Velocity loop proportional gain
- S-0-0101 Velocity loop integral action time
- S-0-0106 Current loop proportional gain 1
- S-0-0107 Current loop integral action time 1

- S-0-0032 Primary mode of operation
- S-0-0036 Velocity command value
- S-0-0037 Additive velocity command value
- S-0-0040 Velocity feedback value
- S-0-0047 Position command value
- S-0-0051 Position feedback 1 value
- S-0-0053 Position feedback 2 value

P-0-0421/424 d : velocity command value
P-0-0420/423 S-0-0036

ID no. and designation of signal for analog output

2.4 New functions

Operating mode: Positioning block

"Positioning block mode" has been implemented.

This makes it possible to successfully run up to 64 programmed travel blocks either on start, on cams or after reaching a target position.

A prerequisite to using this option is the presence of DAE 04.x interface (parallel interface). It has the necessary inputs and outputs (start, cam switches, acknowledgements, and so on).

Drive-controlled referencing

Function "drive-controlled referencing" has been implemented.

The drive can run itself to a reference position. Various ways as to how the drive can run to the reference position have been implemented.

A reference switch can now also be evaluated.

Dynamic cam switch group

Function "dynamic cam switch group" has been implemented. This means it is possible, after reaching a total of eight (8) different positions, to set one bit (cam).

The DEA plug-in module is needed to implement this (not DEA 04.x). With it, the set bits can be generated.

Command load base parameters

Function "load base values" has already been used in the DIAX02 firmware.

It parametrizes velocity and/or current controllers with the values stored in the feedback.

It becomes active as soon as the connector motor type is changed.

In contrast to command "load base values", the newly implemented command "load base parameters" automatically becomes active as soon as a new, unknown parameter is detected.

This is the case when a new software module is used or a firmware version is updated.

While the command is being executed, "PL" appears in the 7-segment display.

The command can also be started upon request as shown:

- press key "S1"
- activate clear error input (CLR)
- input parameter

Once the command is executed, all parameters have valid values. Only a few, application-dependent parameters, need to now be entered.

"DRIVETOP" offers commissioning assistance in this case.

Error memory and operating hours counter

In the past, an operating hours counter and an error memory were used to store class 1 diagnostic type errors and the number of hours that the unit was operational.

This makes the history of the drive available to the user, something which can be useful when errors occur.

Digital inputs

To read digital inputs, interfaces DEA 04.x, 05.x, 06.x, 08.x, 09.x or 10.x can be used. Note, however, that the function of the digital inputs is set for the DEA04.x interface plug-in module.

Also see: "Command communications with parallel interface".

Drive error reactions

The drive's reactions to detected errors has been expanded to include:

- torque clearing
- velocity command value to zero
- velocity command value to zero with ramp and filter
- best possible standstill (various options)

Evaluation of an optional encoder

The evaluation of an optional encoder has been implemented. It can be parametrized as either an additional control encoder or a motor encoder on load side.

Password

A customer password can be activated.

This can be used to write protect all parameters stored on the programming module. The function is intended to prevent unintentional or intentional overwriting of the drive parameters.

Kundenbetreuungsstellen - Sales & Service Facilities

Deutschland – Germany

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

Vertriebsgebiet Mitte Germany Centre <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service	Vertriebsgebiet Ost Germany East <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service	Vertriebsgebiet West Germany West <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service	Vertriebsgebiet Nord Germany North <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service
INDRAMAT GmbH Bgm.-Dr.-Nebel-Str. 2 D - 97816 Lohr am Main Telefon: +49 (0)9352/40-0 Telefax: +49 (0)9352/40-4885	INDRAMAT GmbH Beckerstraße 31 D - 09120 Chemnitz Telefon: +49 (0)371/35 55-0 Telefax: +49 (0)371/35 55-333	INDRAMAT GmbH Harkortstraße 25 D - 40849 Ratingen Telefon: +49 (0)2102/43 18-0 Telefax: +49 (0)2102/41 315	INDRAMAT GmbH Kieler Straße 212 D - 22525 Hamburg Telefon: +49 (0)40/85 31 57-0 Telefax: +49 (0)40/85 31 57-15
Vertriebsgebiet Süd Germany South <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service	Gebiet Südwest Germany South-West <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service		INDRAMAT Service-Hotline INDRAMAT GmbH Telefon: +49 (0)172/660 04 06 oder Telefon: +49 (0)171/333 88 26
INDRAMAT GmbH Ridlerstraße 75 D-80339 München Telefon: +49 (0)89/540138-30 Telefax: +49 (0)89/540138-10	INDRAMAT GmbH Böblinger Straße 25 D-71229 Leonberg Telefon: +49 (0)7152/9 72-6 Telefax: +49 (0)7152/9 72-727		

Kundenbetreuungsstellen in Deutschland - Service agencies in Germany

Europa – Europe

mitwählen!!

vom Ausland: (0) nach Landeskennziffer weglassen,

0 nach Landeskennziffer

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

dial 0 after country code!

Austria <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service Mannesmann Rexroth Ges.m.b.H. Geschäftsbereich INDRAMAT Hägelingasse 3 A - 1140 Wien Telefon: +43 (0)1/9852540-400 Telefax: +43 (0)1/9852540-93	Austria <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth G.m.b.H. Geschäftsbereich INDRAMAT Industriepark 18 A - 4061 Pasching Telefon: +43 (0)7221/605-0 Telefax: +43 (0)7221/605-21	Belgium <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth N.V.-S.A. Geschäftsbereich INDRAMAT Industrielaan 8 B-1740 Ternat Telefon: +32 (0)2/5823180 Telefax: +32 (0)2/5824310	Denmark <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service BEC AS Zinkvej 6 DK-8900 Randers Telefon: +45 (0)87/11 90 60 Telefax: +45 (0)87/11 90 61
England <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth Ltd. INDRAMAT Division 4 Esland Place, Love Lane GB - Cirencester, Glos GL7 1YG Telefon: +44 (0)1285/658671 Telefax: +44 (0)1285/654991	Finland <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service Rexroth Mecman OY Ansatie 6 SF-017 40 Vantaa Telefon: +358 (0)9/84 91 11 Telefax: +358 (0)9/84 91 13 60	France <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth S.A. Division INDRAMAT Parc des Barbanniers 4, Place du Village F-92632 Gennevilliers Cedex Telefon: +33 (0)141 47 54 30 Telefax: +33 (0)147 94 69 41 Hotline: +33 (0)6 08 33 43 28	France <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service Mannesmann Rexroth S.A. Division INDRAMAT 270, Avenue de Lardenne F - 31100 Toulouse Telefon: +33 (0)5 61 49 95 19 Telefax: +33 (0)5 61 31 00 41
France <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service Mannesmann Rexroth S.A. Division INDRAMAT 91, Bd. Irène Joliot-Curie F - 69634 Vénissieux - Cedex Telefon: +33 (0)4 78 78 53 65 Telefax: +33 (0)4 78 78 52 53	Italy <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth S.p.A. Divisione INDRAMAT Via G. Di Vittoria, 1 I - 20063 Cernusco S/N.MI Telefon: +39 02/92 36 52 70 Telefax: +39 02/92 36 55 12	Italy <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth S.p.A. Divisione INDRAMAT Via Borgomanero, 11 I - 10145 Torino Telefon: +39 011/7 71 22 30 Telefax: +39 011/7 71 01 90	Italy <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service Mannesmann Rexroth S.p.A. Divisione INDRAMAT Via del Progresso, 16 (Zona Ind.) I - 35020 Padova Telefon: +39 049/8 70 13 70 Telefax: +39 049/8 70 13 77
Italy <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth S.p.A. Divisione INDRAMAT Via de Nicola, 12 I - 80053 Castellamare di Stabia NA Telefon: +39 081/8 72 30 37 Telefax: +39 081/8 72 30 18	Italy <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service Mannesmann Rexroth S.p.A. Divisione INDRAMAT Viale Oriani, 38/A I - 40137 Bologna Telefon: +39 051/34 14 14 Telefax: +39 051/34 14 22	Netherlands <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service Hydraudyne Hydrauliek B.V. Kruisbroeksestraat 1 P.O. Box 32 NL - 5281 RV Boxtel Telefon: +31 (0)411/65 19 51 Telefax: +31 (0)411/65 14 83 e-mail: indramat@hydraudyne.nl	Netherlands <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Hydrocare B.V. Kruisbroeksestraat 1 P.O. Box 32 NL - 5281 RV Boxtel Telefon: +31 (0)411/65 19 51 Telefax: +31 (0)411/67 78 14
Poland <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service Mannesmann Rexroth Sp.zo.o. Biuro Poznan ul. Dabrowskiego 81/85 PL - 60-529 Poznan Telefon: +48 061/847 67 99 Telefax: +48 061/847 64 02	Spain <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth S.A. Divisió INDRAMAT Centro Industrial Santiga Obradors s/n E-08130 Santa Perpetua de Mogoda Barcelona Telefon: +34 937 47 94 00 Telefax: +34 937 47 94 01	Spain <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Goimendi S.A. Divisió Indramat Jolastokieta (Herrera) Apartado 11 37 E - 20017 San Sebastian Telefon: +34 9 43/40 01 63 Telefax: +34 9 43/39 17 99	Sweden <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Rexroth Mecman Svenska AB INDRAMAT Division Varuvägen 7 S - 125 81 Stockholm Telefon: +46 (0)8/727 92 00 Telefax: +46 (0)8/64 73 277
Switzerland - East <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth AG Geschäftsbereich INDRAMAT Gewerbstraße 3 CH-8500 Frauenfeld Telefon: +41 (0)52/720 21 00 Telefax: +41 (0)52/720 21 11	Switzerland - West <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service Mannesmann Rexroth SA Département INDRAMAT Chemin de l'Ecole 6 CH-1036 Sullens Telefon: +41 (0)21/731 43 77 Telefax: +41 (0)21/731 46 78	Russia <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Tschudnenko E.B. Arsenia 22 RUS - 153000 Ivanovo Rußland Telefon: +7 093/223 96 33 oder/or +7 093/223 95 48 Telefax: +7 093/223 46 01	Slowenia <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service INDRAMAT elektromotorji d.o.o. Otoki 21 SLO - 64 228 Zelezniki Telefon: +386 64/61 73 32 Telefax: +386 64/64 71 50
Turkey <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth Hidropar A..S. Fevzi Cakmak Cad No. 3 TR - 34630 Sefaköy Istanbul Telefon: +90 212/541 60 70 Telefax: +90 212/599 34 07			

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"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth S.A.I.C. Division INDRAMAT Acassuso 48 41/7 RA - 1605 Munro (Buenos Aires)</p> <p>Telefon: +54 (0)1/756 01 40 +54 (0)1/756 01 36</p>	<p>Argentina <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>NAKASE Asesoramiento Tecnico Calle 49, No. 5764-66 RA - 1653 Villa Balester Provincia de Buenos Aires</p> <p>Telefon: +54 (0) 1/768 36 43 Telefax: +54 (0) 1/768 24 13 e-mail: Fehler! Textmarke nicht definiert. nakase@infovia.com.ar</p>	<p>Australia <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>AIMS - Australian Industrial Machinery Services Pty. Ltd. Unit 3/45 Home ST Campbellfield 3061 AUS - Melbourne, VIC</p> <p>Telefon: +61 (0)3/93 59 02 28 Telefax: +61 (0)3/93 59 02 86</p>	<p>Brazil <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth Automação Ltda. Divisão 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</p>
<p>Brazil <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth Automação Ltda. Divisão INDRAMAT Rua Umberto Pinheiro Vieira, 100 Distrito Industrial BR - 09220-390 Joinville - SC [Caixa Postal 1273]</p> <p>Tel./Fax: +55 (0)47/473 55 833 Mobil: +55 (0)47 974 6645 e-mail: prochnow@zaz.com.br</p>	<p>Canada <input checked="" type="checkbox"/> V/S <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 checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>Mannesmann Rexroth (China) Ltd. Shanghai Office - Room 206 Shanghai Internat. Trade Centre 2200 Yanan Xi Lu PRC - Shanghai 200335</p> <p>Telefon: +86 21/62 75 53 33 Telefax: +86 21/62 75 56 66</p>	<p>China <input type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth (China) Ltd. Shanghai Parts & 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"/> V/S <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"/> V/S <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"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Rexroth (China) Ltd. 19 Cheung Shun Street 1st Floor, Cheung Sha Wan, Kowloon, Hongkong</p> <p>Telefon: +852 22 62 51 00 Telefax: +852 27 41 33 44</p>	<p>India <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth (India) Ltd. INDRAMAT Division Plot. 96, Phase III Peenya Industrial Area IND - Bangalore - 560058</p> <p>Telefon: +91 (0)80/8 39 21 01 Telefax: +91 (0)80/8 39 43 45</p>
<p>India <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Mannesmann Rexroth (India) Ltd. 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"/> V/S <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 checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Rexroth Automation Co., Ltd. INDRAMAT Division 1F, I.R. Building Nakamachidai 4-26-44 Tsuzuki-ku, Yokohama-shi J - Kanagawa-ken 224-004</p> <p>Telefon: +81 459/42-72 10 Telefax: +81 459/42-03 41</p>	<p>Mexico <input checked="" type="checkbox"/> V/S <input type="checkbox"/> Service</p> <p>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</p>
<p>Korea <input checked="" type="checkbox"/> V/S <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"/> V/S <input checked="" type="checkbox"/> Service</p> <p>Seo Chang Corporation Ltd. Room 903, Jeail 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"/> V/S <input checked="" type="checkbox"/> Service</p> <p>HYTEC 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"/> V/S <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"/> V/S <input checked="" type="checkbox"/> Service	USA <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service	USA <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service	USA <input checked="" type="checkbox"/> V/S <input checked="" type="checkbox"/> Service
Mannesmann Rexroth Corporation 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	Mannesmann Rexroth Corporation 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	Mannesmann Rexroth Corporation 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	Mannesmann Rexroth Corporation 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"/> V/S <input checked="" type="checkbox"/> Service Mannesmann Rexroth Corporation 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			

Kundenbetreuungsstellen außerhalb Europa / USA
Service agencies outside Europe / USA

Notes

