



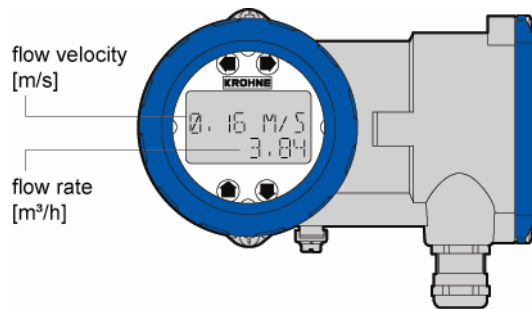
DWM 2000 D Operating instructions

DWM 2000 Electromagnetic Flowmeter with LCD Indicator

Contents

1 Display data in operating mode.....	3
2 Functions of the LCD indicator for the DWM 2000 D	4
2.1 Programmable parameters	4
2.1.1 Flow calibration	4
2.1.2 Current output adjustment	4
2.1.3 Time constant	4
2.2 Electronics module checks	5
2.3 Programming structure (Software n° 1.02)	5
2.3.1 User interface buttons	5
2.3.2 Menu navigation	6
2.3.3 Summary of programming menus	8
2.4 Parameters stored in the EEPROM (menu 2.4.3)	10
2.5 Error message list	11

1 Display data in operating mode



2 Functions of the LCD indicator for the DWM 2000 D

2.1 Programmable parameters

2.1.1 Flow calibration

The G_K can be modified in menu 2.1.3 in order to obtain the maximum accuracy at operating conditions. A field calibration requires an accurate reference of velocity. The meter recalibration (G_K modification) is also recommended after an exchange of electronics module.

The value of the new calibration constant ($G_{K\text{ new}}$) can be calculated as follows:

$$G_{K\text{ new}} = G_{K\text{ old}} \times \frac{V_a}{V_m}$$

with:

V_a = actual velocity

V_m = measured velocity (reference value)

2.1.2 Current output adjustment

The minimum value ($i_{0\%}$) and the maximum value ($i_{100\%}$) of the current output at normal operating conditions can be adjusted from menus 2.2.2. and 2.2.3.

The actual values of the $i_{0\%}$ and the $i_{100\%}$ must be measured with an accurate milliammeter in a 4...20 mA loop.

$i_{0\%}$ must be in the range 3...12 mA. The factory setting is 4 mA.

$i_{100\%}$ must be in the range 12...21 mA. The factory setting is 20 mA.

2.1.3 Time constant

The time constant value can be set in menu 2.2.4. This value represents the time needed to detect 63% of a simulated flow rate instantaneously raised from 0 to 100%. Time constant range : 5, 10, 15, 20, 25, 30, 50 m.

2.2 Electronics module checks

Various parameters from the electronics module can be viewed directly for troubleshooting purposes.

The DWM 2000 switches to alarm mode when the current output is permanently below 3 mA. In this case the current output value indicates the type of error that occurs:

Obey the instructions that follow to find faults and the corrective actions to be undertaken.

Call up the error messages (menu 1.2.2.) and note the last one.

Refer to the error message list. Replace the electronics module in case of fatal error, deactivate the alarm mode in menu 1.2.1. or the alarm count in menu 1.2.4 (in case of minor error).



CAUTION

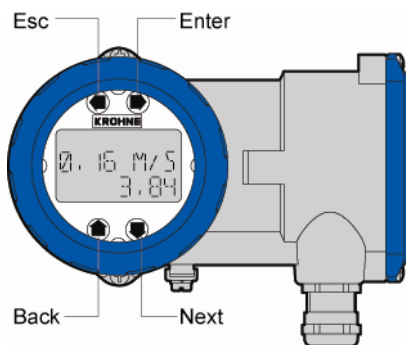
Make sure that the instrument is correctly grounded.

Install the instrument in the sequence given in the installation manual.

A bad mechanical or electrical connection will cause the DWM 2000 to operate incorrectly.

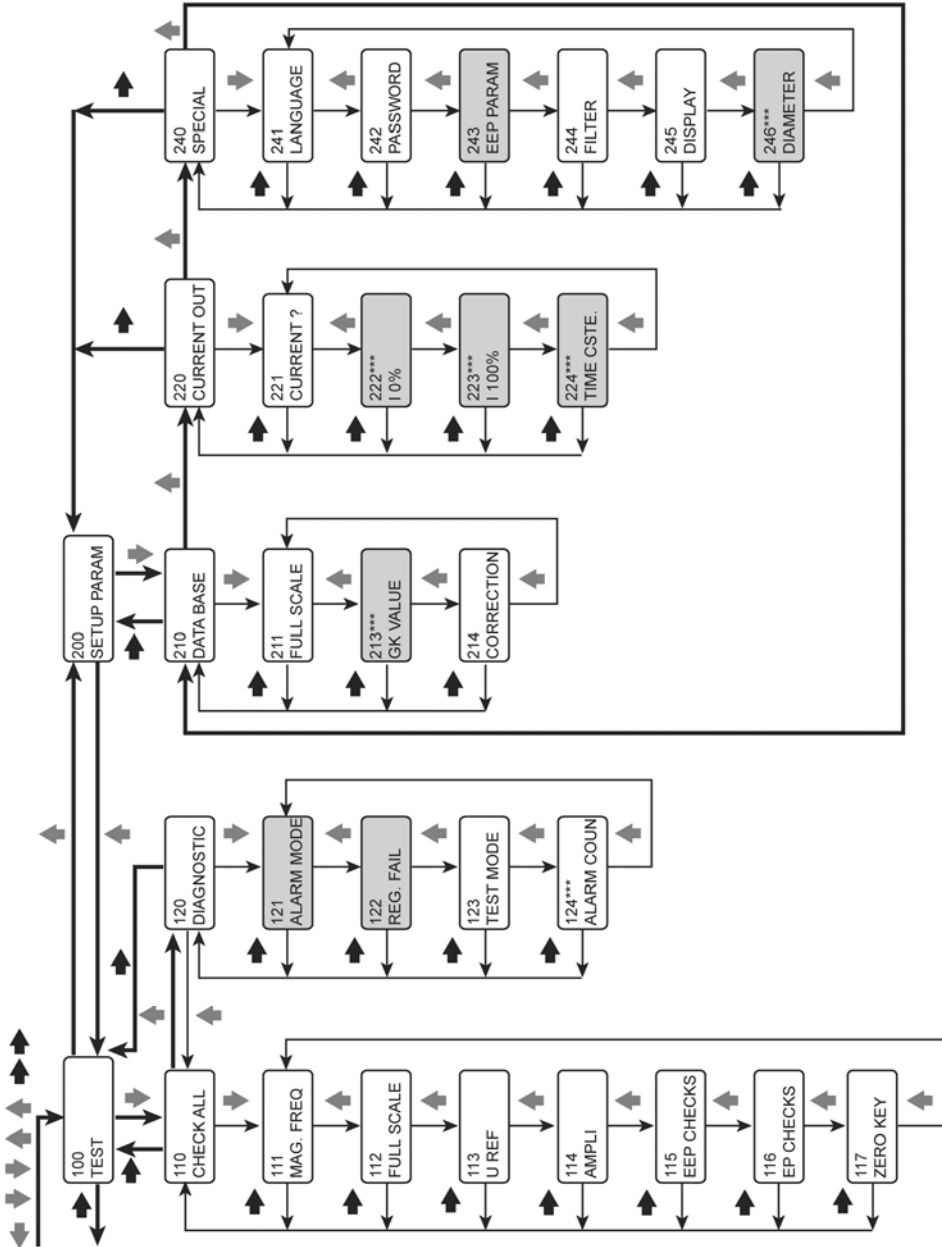
2.3 Programming structure (Software n° 1.02)

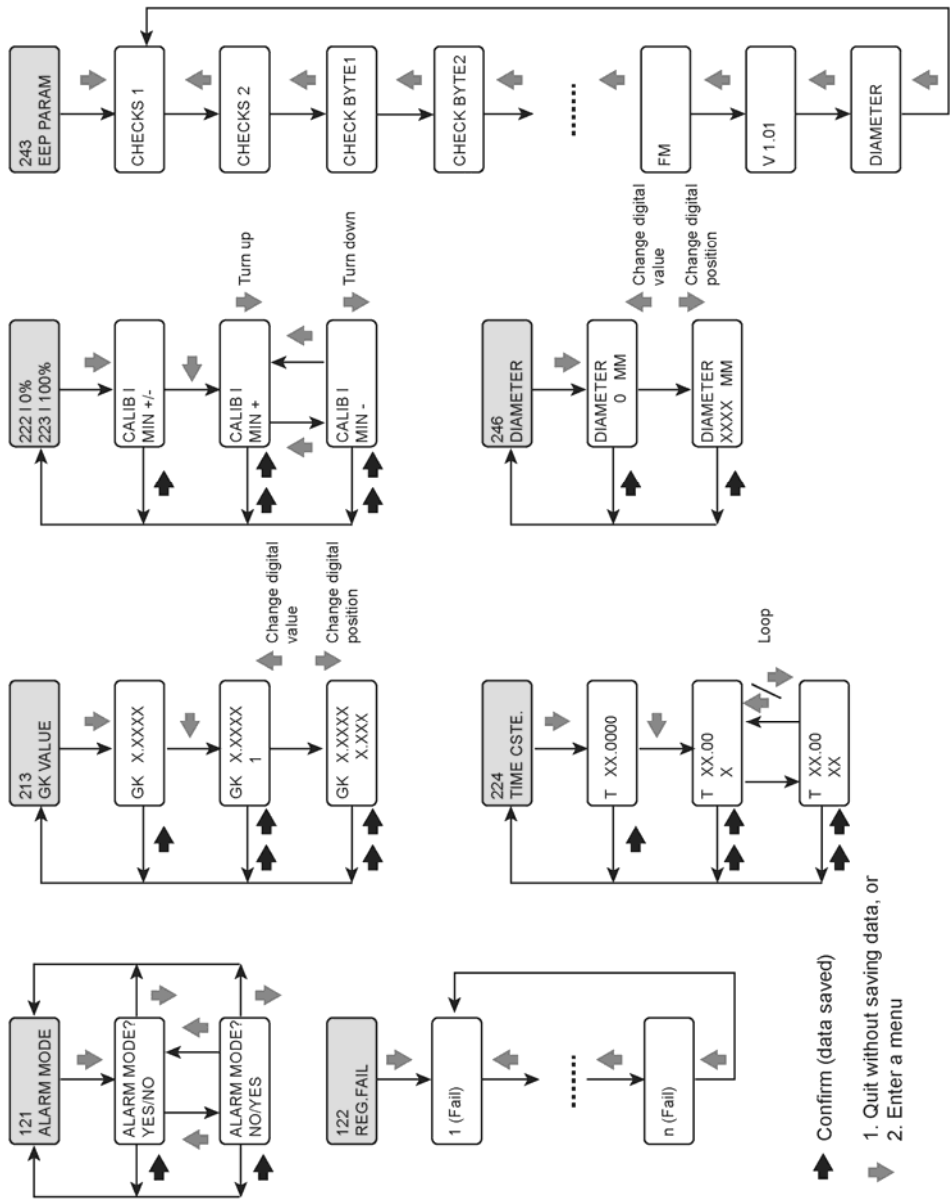
2.3.1 User interface buttons



2.3.2 Menu navigation

Go through the steps given in the illustrations that follow to get to the required menu.





- ➔ Confirm (data saved)
- ➔ 1. Quit without saving data, or
- ➔ 2. Enter a menu

2.3.3 Summary of programming menus

Fct. n°	Text	Description and settings
1.0.0.	TEST	Main menu 1.0.0.
1.1.0.	CHECK ALL	Sub menu 1.1.0. for check of electronic components
1.1.1.	MAG. FEQ.	Frequency of magnetic field $10 \text{ Hz} \leq \text{frequency} \leq 14.5 \text{ Hz}$, operating mode
1.1.2.	FULL SCALE	Programmed full scale $1 \text{ m/s} \leq \text{full scale} \leq 8 \text{ m/s}$
1.1.3.	U REF	Internal voltage reference U Ref. = 2.5 V
1.1.4.	AMPLI	Test value of amplifier control loop Value ≥ 40 in test mode
1.1.5.	EEP CHECKS	Result of data check in EEPROM "XXX": measured value = test has been successful "XXX + ALARM": test has failed and alarm mode has been activated (current output value $< 4 \text{ mA}$).
1.1.6.	EP CHECKS	Result of data check in EEPROM Value = 22309
1.1.7.	ZERO KEY	Result of zero calibration push button test "OK": test has been successful; "ALARM": The test has failed and alarm mode has been activated (current output $< 4 \text{ mA}$). This is only a test and does not reset the instrument to zero. Refer to the installation manual to use the Zero Cal button on the DWM 2000 electronics block correctly.
1.2.0.	DIAGNOSTIC	Sub menu 1.2.0. Diagnostic
1.2.1	ALARM MODE	Deactivation of the alarm mode (current output $< 4 \text{ mA}$) caused by test failure (see menu 1.1.2. to 1.1.7). "YES": alarm mode is enabled "NO": alarm mode is disabled
1.2.2.	REG FAIL.	All the error messages that have occurred since the first power-up are listed. Maximum storage capacity: 32 messages See section "2.5 Error Message List" for the meaning of error messages.
1.2.3.	TEST MODE	Activation of PRODUCT (factory auto-diagnostic test mode) or CUSTOM (field auto-diagnosis test mode = less severe). Default setting: CUSTOM (field test mode)
1.2.4.	ALARM COUNT	Reset of the alarms counter
2.0.0.	SET UP PARAMETER	Main menu 2.0.0.
2.1.0.	DATA BASE	Sub menu 2.1.0. Base data
2.1.1.	FULL SCALE	Not available.
2.1.3.	GK VALUE	Primary head calibration constant $0.8 \leq G_K \leq 1.300$ See section "1.1.1. Flow calibration" on how to recalculate G_K .
2.1.4.	CORRECTION	Activation of the low flow linearization for velocity below 3 m/s. Select "YES" or "NO", default setting: "YES"

Fct. n°	Text	Description and settings
2.2.0.	CURRENT OUT	Sub menu 2.2.0. Current output
2.2.1.	CURRENT?	Not available
2.2.2.	I 0%	Calibration of the current output for $i_{0\%}$ Measure the exact value on a milliammeter and press the “+” or “-” key in order to obtain the wished value for $i_{0\%}$ $3 \text{ mA} \leq i_{0\%} \leq 12 \text{ mA}$
2.2.3.	I 100%	Calibration of the current output for $i_{100\%}$ Measure the exact value on a milliammeter and press the “+” or “-” key in order to obtain the wished value for $i_{100\%}$ $12 \text{ mA} \leq i_{100\%} \leq 21 \text{ mA}$
2.2.4.	TIME CONST.	Time constant for output of the measured values Range: 5, 10, 15, 20, 25, 30, 50 m
2.4.0.	SPECIAL	Sub menu 2.4.0. Special functions
2.4.1.	LANGUAGE	Language for display text “GB”: English “F”: French “D”: German
2.4.2.	PASSWORD	Not available
2.4.3.	EPP PARAM.	Display of the different parameters memorised in the EEPROM: see section “2.4 Parameters Stored in the EEPROM”. Read only.
2.4.4.	FILTER	Activation of an electronic filter for noisy applications (foam, solid contents). Select “YES” or “NO”, default setting “YES”.
2.4.5.	DISPLAY	Display of the actual velocity in m/s. The velocity is displayed after quitting the programming menu. Select “YES” or “NO”. Default setting “NO”. It must be programmed to “NO” before you disconnect the DWM 2000 D.
2.4.6.	DIAMETER	Diameter of the pipe into which the sensor is inserted. This value is needed for calculating the flow rate. If you enter a value of “0”, this switches off flow rate on the indicator display. Refer also to the CAUTION that follows. $50 \text{ mm} \leq \text{diameter} \leq \text{XXXX mm}$



CAUTION

Do not use menu 2.4.6 to read the setting for the pipe diameter. This will reset the value to default “0” and switch off the flow rate line on the indicator display. Use menu 2.4.3 to read EEPROM settings (this includes DIAMETER). If the value is reset to “0”, you must re-enter the pipe diameter in menu 2.4.6.

2.4 Parameters stored in the EEPROM (menu 2.4.3)

Parameter	Comment	Typical value
CHECKS 1	Check EEPROM n°1	-
CHECKS 2	Check EEPROM n°2	-
CHECKS BYTE 1	Check EEPROM	-
CHECKS BYTE 2	Check EEPROM	-
CPT ALARM.	Counting of all the error messages since the first power-up.	-
CPT ALARM.2:	Counting of all the error messages since the last reset.	-
TEST	Indication of auto diagnostic test level	CUSTOM
CORRECTION YES/NO	Indication of activation of low velocity linearization.	YES
EP CHECKS	Result of the data check in EPROM (see menu 1.1.6.)	Value = 22309 With soft V1.02
FS	Display of the programmed full scale values (see menu 1.1.2.)	1 m/s ... 8 m/s
GK	Primary head calibration constant (see menu 2.1.3.)	0.8 ... 1.3
U REF	Internal voltage reference (see menu 1.1.3.)	2.4. ... 2.6.
T CST	Time constant (see menu 2.2.4.)	5 s
TEST AMP	Test value of the amplifier control loop (see menu 1.1.4.)	75 ... 95
FM	Frequency of the magnetic field (see menu 1.1.1.)	10 ... 14.5 Hz
DIAMETER	Diameter of pipeline (see menu 2.4.6)	≥ 50 mm

2.5 Error message list

Listed below are the messages which can appear in menu 1.2.2. This function stores all the faults that have occurred since the first connection to power.

Error messages	Comment	Actions
MAG. FREQ	No magnetic field frequency out of range $10 \text{ Hz} \leq \text{frequency} \leq 14.5 \text{ Hz}$	Replace the electronics module
AMPLI	Dysfunction of the amplifier loop	Replace the electronics module
F.S.	Programmed full scale out of range ($>8 \text{ m/s}$ or $<1 \text{ m/s}$).	Replace the electronics module
ZERO KEY	Dysfunction of ZERO key (short circuit)	Replace the electronics module
EP CHECK	Data loss in EPROM (software)	Replace the electronics module
EEP CHECK	Data loss in EEPROM (calibration and calculation data)	Replace the electronics module
U REF	Amplifier voltage reference is damaged	Replace the electronics module
CURR. OUT	Incorrect position of the internal current output switch	Replace the electronics module
FS SWIT EEP	Modification of the full scale power on	Program the full scale power off
ZERO	Velocity measurement during the zero adjustment is more than 0.2 m/s .	Deactivate the alarm mode and adjust the zero again

KROHNE measuring technology - Product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Mass flowmeters
- Ultrasonic flowmeters
- Vortex flowmeters
- Flow controllers
- Level measuring instruments
- Temperature measuring instruments
- Pressure measuring instruments
- Analysis
- Oil and gas industry

Addresses:

Germany

Northern sales office

KROHNE Messtechnik GmbH & Co. KG
Bremer Str. 133
D-21073 Hamburg
Phone: +49 (0)40 767 3340
Fax: +49 (0)40 767 33412
nord@krohne.com
ZIP code: 10000 - 29999, 49000 - 49999

Western and middle sales office

KROHNE Messtechnik GmbH & Co. KG
Ludwig-Krohne-Straße
D-47058 Duisburg
Phone: +49 (0)203 301 4416
Fax: +49 (0)203 301 10416
west@krohne.de
ZIP code: 30000 - 34999, 37000 - 48000, 50000 - 53999, 57000 - 59999, 98000 - 99999

Southern sales office

KROHNE Messtechnik GmbH & Co. KG
Landsberger Str. 392
D-81241 Munich
Phone: +49 (0)89 121 5620
Fax: +49 (0)89 129 6190
sued@krohne.com
ZIP code: 0 - 9999, 80000 - 89999, 90000 - 97999

Southwestern sales office

KROHNE Messtechnik GmbH & Co. KG
Rüdesheimer Str. 40
D-65239 Hochheim/Main
Phone: +49 (0)6146 827 30
Fax: +49 (0)6146 827 312
rhein-main@krohne.com
ZIP code: 35000 - 36999, 54000 - 56999, 60000 - 79999

Instrumentation and control equipment catalog

TABLAR Messtechnik GmbH
Ludwig-Krohne-Straße 5
D-47058 Duisburg
Phone: +49 (0)2 03 305 880
Fax: +49 (0)2 03 305 888
kontakt@tablar.de; www.tablar.de

KROHNE sales companies

International

Australia

KROHNE Australia Pty Ltd
Quantum Business Park 10/287
Victoria Rd Rydalmere NSW 2116
Phone: +61 2 8846 1700
Fax: +61 2 8846 1755
krohne@krohne.com.au

Austria

KROHNE Gesellschaft m.b.H.
Modecenterstraße 14
A-1030 Vienna
Phone: +43 (0)1/203 45 32
Fax: +43 (0)1/203 45 32 99
info@krohne.at

Belgium

KROHNE Belgium N.V.
Brusselstraat 320
B-1702 Groot Bijgaarden
Phone: +32 (0)2 4 66 00 10
Fax: +32 (0)2 4 66 08 00
krohne@krohne.be

Brazil

KROHNE Conaut Controles
Automaticos Ltda.
Estrada Das Águas Espraiadas, 230
C.P. 56 06835 - 080 EMBU - SP
Phone: +55 (0)11 4785-2700
Fax: +55 (0)11 4785-2768
conaut@conaut.com.br

China

KROHNE Measurement Instruments
(Shanghai) Co. Ltd., (KMIC)
9th Floor, Xujiahui International
Building
1033 Zhaojiajiang Road
Shanghai 200030
Phone: +86 21 6487 9611
Fax: +86 21 6438 7110
info@krohne-asia.com

Czech Republic

Krohne CZ, spol. s r.o.
Soběšická 156
63800 Brno
Phone: +420 (0)545.242 627
Fax: +420 (0)545 220 093
brno@krohne.cz

France

KROHNE S.A.S.
Les Ors BP 98
F-26103 ROMANS Cedex
Phone: +33 (0)4 75 05 44 00
Fax: +33 (0)4 75 05 00 48
info@krohne.fr

Great Britain

KROHNE Ltd.
Rutherford Drive
Park Farm Industrial Estate
Wellingborough
Northants NN8 6AE
Phone: +44 (0)19 33 408 500
Fax: +44 (0)19 33 408 501
info@krohne.co.uk

CIS

Kanex KROHNE Engineering AG
Business-Centre Planeta
Office 404 ul.
Marxistskaja 3
109147 Moscow/Russia
Phone: +7 (0)095 911 7165
Fax: +7 (0)095 742 8873
krohne@dol.ru

India

Krohne Marshall Ltd.
A-34/35, M.I.D.C. Industrial Area,
H-Block
Pimpri Poona 411018
Phone: +91 (0)202 744 2020
Fax: +91 (0)202 744 2020
pcu@vsnl.net

Iran

KROHNE Liaison Office
North Sohrvardi Ave. 26,
Sarmad St., Apt. #9
Tehran 15539
Phone: +9821 8874 5973
Fax: +9821 8850 1268
krohne@krohneiran.com

Italy

KROHNE Italia Srl.
Via V. Monti 75
I-20145 Milan
Phone: +39 02 4300 661
Fax: +39 02 4300 6666
info@krohne.it

Korea

KROHNE Korea
Room 508 Miwon Bldg 43
Yoido-Dong Youngdeungpo-Ku
Seoul, Korea
Phone: 00-82-2-782-1900
Fax: 00-82-2-780-1749
mail@krohne.co.kr

Netherlands

KROHNE Nederland B.V.
Kerkpleat 14
NL-3313 LC Dordrecht
Phone: +31 (0)78 630 6200
Fax: +31 (0)78 630 6405
Service Direct: +31 (0)78 630 6222
info@krohne.nl

Norway

KROHNE Norway A.S.
Ekholtveien 114
NO-1521 Moss
Phone: +47 (0)69 264 860
Fax: +47 (0)69 267 333
postmaster@krohne.no

Poland

KROHNE Polska Sp.z.o.o.
ul. Stary Rynek Oliwski 8a
80-324 Gdansk
Phone: +48 (0)58 520 9211
Fax: +48 (0)58 520 9212
info@krohne.pl

Switzerland

KROHNE AG
Uferstr. 90
CH-4019 Basel
Phone: +41 (0)61 638 30 30
Fax: +41 (0)61 638 30 40
info@krohne.ch

Singapore

Tokyo Keiso - KROHNE (Singapore)
Pte. Ltd.
14, International Business Park,
Jurong East
Chiyoda Building, #01-01/02
Singapore 609922
Phone: (65) 6567 4548
Fax: (65) 6567 9874
tks@tokyokeiso-krohne.com.sg

Republic of South Africa

KROHNE Pty. Ltd.
Bushbock Close
Corporate Park South
Midrand, Gauteng
P.O. Box 2069
Midrand, 1685
Tel.: +27 (0)11 314 1391
Fax: +27 (0)11 314 1681
midrand@krohne.co.za

Spain

I.I. KROHNE IBERIA, S.r.l.
Poligono Industrial Nilo
Calle Brasil, nº. 5
28806 Alcalá de Henares Madrid
Phone: +34 (0)91 883 2152
Fax: +34 (0)91 883 4854
krohne@krohne.es

USA

KROHNE, Inc.
7 Dearborn Road
Peabody, MA 01960
Phone: +1 (800) FLOWING
Phone: +1 (978) 535 6060 (in MA)
info@krohne.com

Representatives

Algeria
Argentina
Cameroon
Canada
Chile
Columbia
Croatia
Denmark
Ecuador
Egypt
Finland
Gabon
Ghana
Greece
Hong Kong
Hungary
Indonesia
Iran
Ireland
Israel
Ivory Coast
Japan
Jordan
Kuwait
Libya
Lithuania
Malaysia
Mauritius
Mexico
Morocco
New Zealand
Peru
Portugal
Romania
Saudi Arabia
Senegal
Slovakia
Slovenia
Sweden
Taiwan
Thailand
Tunisia
Turkey
Venezuela
Yugoslavia

Other countries

KROHNE Messtechnik GmbH & Co. KG
Ludwig-Krohne-Str. 5
D-47058 Duisburg
Phone: +49 (0)203 301 0
Fax: +49 (0)203 301 389
export@krohne.de