



OPTISONIC V6 Technical Datasheet

6-chord ultrasonic gas flowmeter for non-custody transfer

- 4-reflection chords for high accuracy; 2-reflection chords for extra diagnosis options
- Built-in redundancy through dynamic chord substitution
- Performance monitoring and fouling detection



Ultrasonic gas flowmeter for non-custody transfer

As times change, so do the requirements for ultrasonic meters. Today it is assumed that an ultrasonic device measures accurately and precisely, but what about long-term reliability? After all, this depends on more than just the ultrasonic meter itself. For instance the effect of change of process conditions or dirt, which may collect on the meter over time, can also have a negative effect.

The unique chord arrangement of the **OPTISONIC V6** enables it to generate diagnostic data for places where traditional ultrasonic meters gathered too little information or none at all: firstly at the pipe wall itself, scanning with reflection. Secondly, at the bottom of the pipe. This data is gathered using a separate diagnostic chord.

This extensive diagnostic data allows the **OPTISONIC V6** to carry out self-monitoring, which sets the standard for other devices in terms of performance monitoring.



Highlights

- 6-chord design
- High reliability with built-in redundancy
- Swirl compensation in each measuring plane
- Transducer replacement under pressure
- Bi-directional flow measurement
- Self-draining transducers
- Fully encapsulated cabling
- Field display for main functions

Industries

- Oil & Gas
- Petrochemical

Applications

- Offshore FPSO and platforms
- Onshore exploration
- Transmission
- Underground gas storage (UGS)
- Distribution
- Large gas intakes, for example for power stations, petrochemical industry, aluminum melters, etc.

Technical data

Functions

Device	Ultrasonic gas flowmeter
Description	The OPTISONIC V6 flowmeter consists of a meter body with ultrasonic transducers and a converter box for signal processing and counter display mounted on top of the meter body
Measurement functionality	Actual volume flow rate and totalized volume; bi-directional

Design

Diameter	
[mm]	100, 150, 200, 250, 300, 400, 500, 600; optional: 350, 450
[inches]	4", 6", 8", 10", 12", 16", 20", 24"; optional: 14", 18"
	Other diameters on request

Measurement accuracy

Uncertainty	$\leq \pm 1\%$ of measured value
Repeatability	$\leq \pm 0.1\%$

Operating conditions

Flow range	See Flow table (page 10)
Pressure	4...150 bar / 0.4...15 MPa / 60...2175 psi ASME150...900 (lower or higher pressures optional)
Ambient temperature	-40...+65°C / -40...+150°F
Process temperature	-50...+80°C / -58...+175°F (lower or higher temperatures optional)
Wet gas content	LM <0.3 (uncertainty may increase with increasing liquid fraction)
CO ₂ content	Conform ISO 17089

Installation conditions

Straight inlet length (minimum)	10D or 5D with flow conditioner
Straight outlet length (minimum)	3D
Position temperature transmitter (minimum)	1.5D downstream or 4D upstream

Materials

Flanges	Carbon steel, stainless steel or duplex optional
Measuring tube	Carbon steel, stainless steel or duplex optional
Converter	Aluminum, stainless steel optional
Finish	Outside: 2-layer silver RAL9006; inside: corrosion preservative
	Optional outside: nickel coating; inside: nickel coating
	Optional outside: offshore coating; inside: corrosion preservative
	Other finishes on request

Electrical connection

Power supply	24 VDC / <10 W
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Inputs / outputs

Inputs	
Serial	Optional: 1x RS485
Analog	Optional: 2 x 16 bit analog 4...20 mA
MODBUS	In preparation
HART®	In preparation
Outputs	
Digital	4x; optocoupler based; 50% duty cycle; fully programmable
	Pulse 0° phase; 180° phase
	Alarm (data valid); flow direction; partial failure; auxiliary status
Serial	2x RS485; individually configurable
	MODBUS protocol: KROHNE standard (Daniel; Instromet emulated)
Analog	In preparation: 4...20 mA; active / passive
USB 2.0	For maintenance only
Ethernet connectivity	In preparation

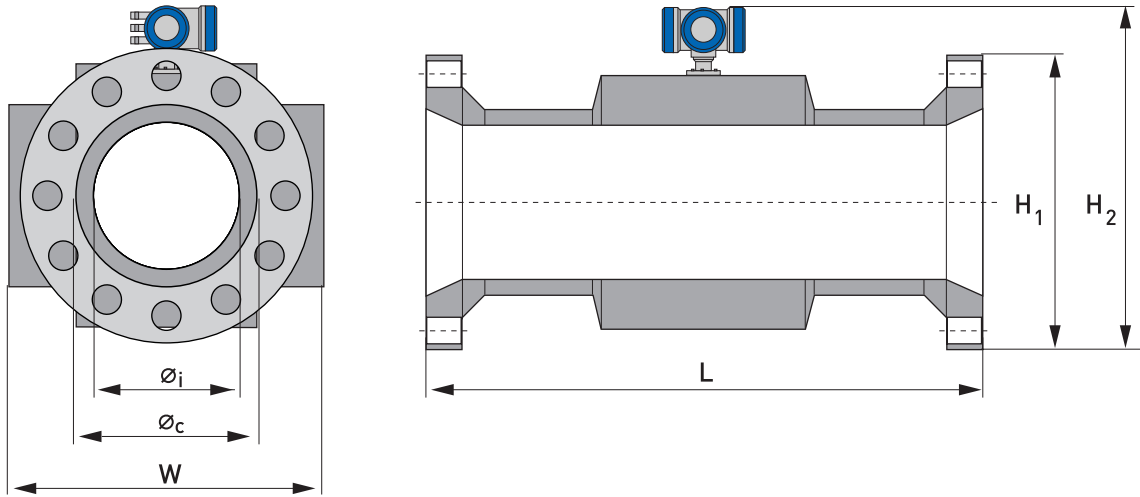
Approvals

Hazardous area	ATEX: II 2 G Ex d ma IIB T5 resp. Ex de ma IIB T5; zone 0
	FM: class1; division 1; group D (pending)
Protection category	IP66

Verifications

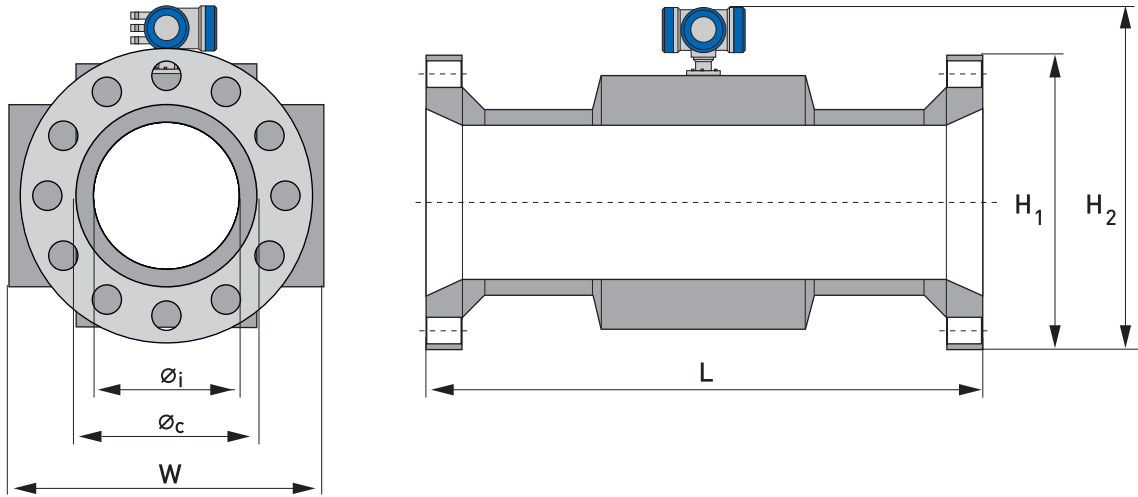
Hydrostatic test (1.5xPdesign / 10 min.)	Standard; witnessing optional
Factory Acceptance Test (FAT)	Standard; witnessing optional
Leakage test (1.1xPdesign / 30 min.)	Optional; witnessing optional

Dimensions and weights



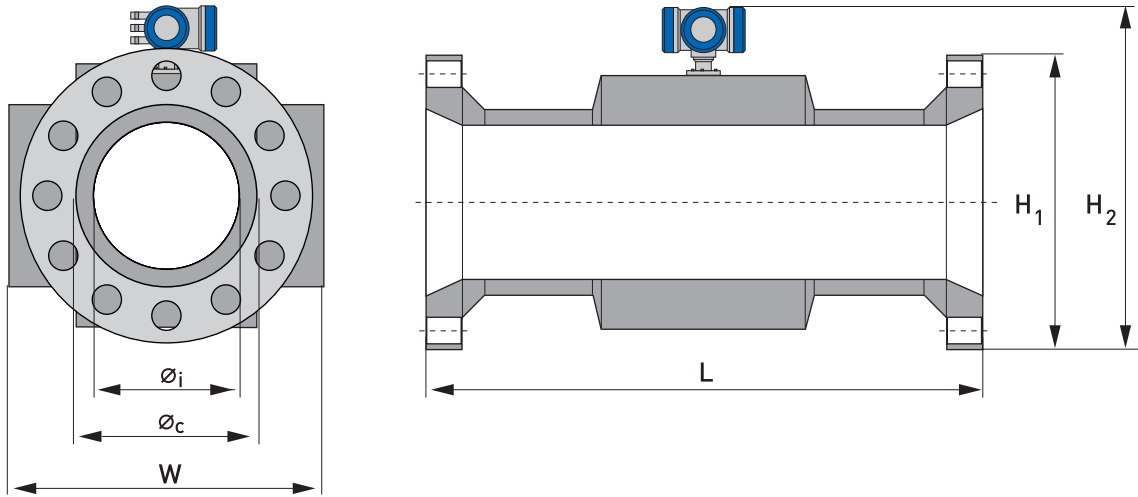
ASME150 [mm]	\varnothing_c		\varnothing_i	H1	H2	L	W	Weight [kg]
	min	max						
100	102	107	96	229	520	300	330	119
150	154	160	144	279	570	450	380	198
200	202	207	191	343	620	600	430	301
250	254	261	239	406	660	750	470	417
300	303	312	284	483	740	900	540	193
350	333	340	312	533	780	1050	570	267
400	381	391	358	597	840	1200	620	375
450	428	442	405	635	890	1350	670	495
500	477	489	448	699	940	1500	720	666
600	574	591	540	813	1050	1800	820	1080

ASME150 [inch]	\varnothing_c		\varnothing_i	H1	H2	L	W	Weight [lbs]
	min	max						
4	4.02	4.21	3.78	9.02	20.47	11.81	12.99	262
6	6.06	6.30	5.67	10.98	22.44	17.27	14.96	436
8	7.95	8.15	7.52	13.50	24.41	23.62	16.93	664
10	10.00	10.28	9.41	15.98	25.98	29.53	18.50	919
12	11.93	12.28	11.18	19.01	29.13	35.43	21.26	425
14	13.11	13.39	12.28	20.98	30.71	41.34	22.44	589
16	15.00	15.39	14.09	23.50	33.07	47.24	24.41	827
18	16.85	17.40	15.94	25.00	35.04	53.15	26.38	1091
20	18.78	19.25	17.64	27.52	37.01	59.06	28.35	1468
24	22.60	23.27	21.26	32.00	41.34	70.87	32.28	2381



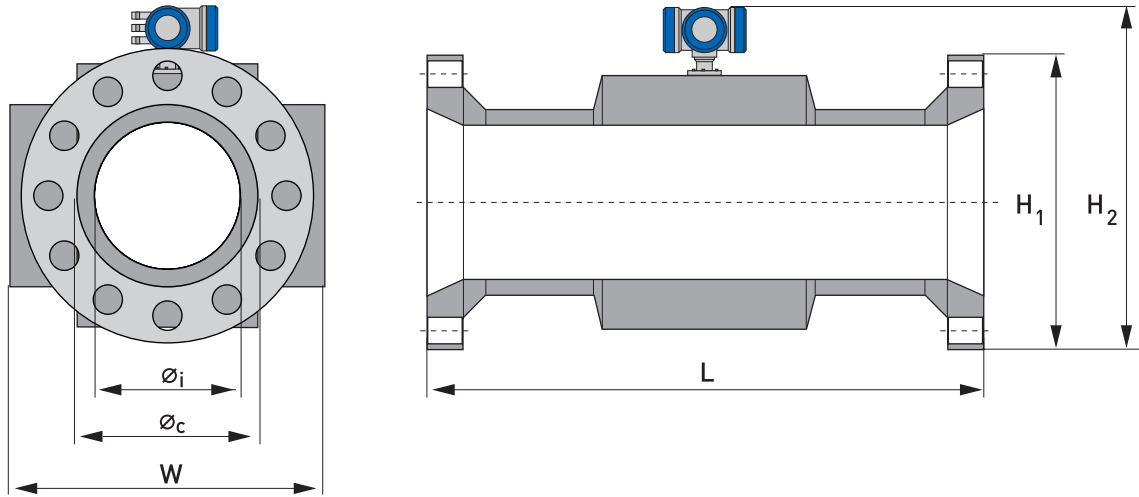
ASME300 [mm]	Øc		Øi	H1	H2	L	W	Weight [kg]
	min	max						
100	102	107	96	254	520	300	330	129
150	154	160	144	318	570	450	380	218
200	202	207	191	381	620	600	430	331
250	254	261	239	445	680	750	470	465
300	303	312	284	521	760	900	540	234
350	333	340	312	584	810	1050	590	343
400	381	391	358	648	870	1200	650	465
450	428	442	405	711	920	1350	720	621
500	477	489	448	775	980	1500	780	814
600	574	591	540	914	1100	1800	920	1316

ASME300 [inch]	Øi		Øi	H1	H2	L	W	Weight [lbs]
	min	max						
4	4.02	4.21	3.78	10.00	20.47	11.81	12.99	284
6	6.06	6.30	5.67	12.52	22.44	17.72	14.96	480
8	7.95	8.15	7.52	15.00	24.41	23.62	16.93	730
10	10.00	10.28	9.41	17.52	26.77	29.53	18.50	1025
12	11.93	12.28	11.18	20.51	29.92	35.43	21.26	516
14	13.11	13.39	12.28	22.99	31.89	41.34	23.23	756
16	15.00	15.39	14.09	25.51	34.25	47.24	25.59	1025
18	16.85	17.40	15.94	27.99	36.22	53.15	28.35	1369
20	18.78	19.25	17.64	30.51	38.58	59.06	30.71	1795
24	22.60	23.27	21.26	35.98	43.31	70.87	36.22	2901



ASME600 [mm]	Øc		Øi	H1	H2	L	W	Weight [kg]
	min	max						
100	97	105	96	273	520	400	330	140
150	146	158	144	356	575	450	375	248
200	193	205	191	419	630	600	425	376
250	242	258	239	508	710	750	510	548
300	289	308	284	559	780	900	560	326
350	317	337	312	603	815	1050	610	413
400	363	388	358	686	880	1200	690	590
450	409	435	405	734	930	1350	740	765
500	455	483	448	813	1000	1500	820	1003
600	547	581	540	940	1100	1800	940	1558

ASME600 [inch]	Øc		Øi	H1	H2	L	W	Weight [lbs]
	min	max						
4	3.82	4.13	3.78	10.75	20.47	15.75	12.99	309
6	5.75	6.22	5.67	14.02	22.64	17.72	14.76	547
8	7.60	8.07	7.52	16.50	24.80	23.62	16.73	829
10	9.53	10.16	9.41	20.00	27.95	29.53	20.08	1208
12	11.38	12.13	11.18	22.01	30.71	35.43	22.05	719
14	12.48	13.27	12.28	23.74	32.09	41.34	24.02	910
16	14.29	15.28	14.09	27.01	34.65	47.24	27.17	1301
18	16.10	17.13	15.94	28.90	36.61	53.15	29.13	1687
20	17.91	19.02	17.64	32.01	39.37	59.06	32.28	2211
24	21.54	22.87	21.26	37.01	43.31	70.87	37.01	3435



ASME900 [mm]	Øc		Øi	H1	H2	L	W	Weight [kg]
	min	max						
100	97	103	96	292	520	400	330	152
150	146	155	144	381	590	450	390	273
200	193	203	191	470	660	600	470	431
250	242	255	239	546	730	750	550	605
300	289	304	284	610	810	1200	610	427
350	317	334	312	641	840	1050	650	519
400	363	381	358	705	890	1200	710	671
450	409	429	405	787	960	1350	790	926
500	455	478	448	857	1020	1500	860	1190
600	547	575	540	1041	1160	1800	1050	2128

ASME900 [inch]	Øi		Øi	H1	H2	L	W	Weight [lbs]
	min	max						
4	3.82	4.06	3.78	11.50	20.47	15.75	12.99	335
6	5.75	6.10	5.67	15.00	23.23	17.72	15.35	602
8	7.60	7.99	7.52	18.50	25.98	23.62	18.50	950
10	9.53	10.04	9.41	21.50	28.74	29.53	21.65	1334
12	11.38	11.97	11.18	24.02	31.89	47.24	24.02	941
14	12.48	13.15	12.28	25.24	33.07	41.34	25.59	1144
16	14.29	15.00	14.09	27.76	35.04	47.24	27.95	1479
18	16.10	16.89	15.94	30.98	37.80	53.15	31.10	2041
20	17.91	18.82	17.64	33.74	40.16	59.06	33.86	2623
24	21.54	22.64	21.26	40.98	45.67	70.87	41.34	4691

Flow table

		Turn down	Q _{min}	Q _{max}	Q _{min}	Q _{max}
[mm]	[inches]		[m ³ /h]		[cf/h]	
100	4	40	20	800	800	28000
150	6	>55	32	1800	1200	63000
200	8	>75	40	3100	1500	109000
250	10	>95	50	4800	1800	169000
300	12	100	65	6600	2300	232000
350	14	100	80	8000	2900	282000
400	16	>80	120	10100	4300	356000
450	18	>80	130	12500	4600	441000
500	20	>70	200	14800	7100	522000
600	24	>70	285	20600	10100	727000
		Calculations shall be used as an indication. Please ask KROHNE engineering for detailed sizing.				



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.com
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-Str. 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 Conat 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
conat@conat.com.br

China

KROHNE Measurement Instruments
(Shanghai) Co. Ltd., [KMIC]
9th Floor, Puyuan Science Park,
Building A
396 Guilin Road
Shanghai 200233
Tel.: +86 (021) 6470 5656
Fax: +86 (021) 6451 6408
info@krohne-asia.com

Czech Republic

Krohne CZ, spol. s r.o.
Soběsická 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 "POLLARS", office
164
Derbenevskaya nab., 11-B
113114 Moscow/Russia
Tel. / Fax: +7 (0)495 913-68-41
Tel. / Fax: +7 (0)495 913-68-42
Tel. / Fax: +7 (0)495 913-68-43
Tel. / Fax: +7 (0)495 913-68-44
krohne@krohne.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 Sohravardi 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.
Kerkeplaat 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.L. 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
Cameroun
Canada
Chile
Columbia
Croatia
Denmark
Ecuador
Egypt
Finland
Gabon
Ghana
Greece
Hong Kong
Hungary
Indonesia
Iran
Ireland
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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.com