

## OPTIWAVE 7300 C Technical Datasheet

### Non-contact Radar (FMCW) Level Meter

- The only 2-wire K-band Frequency-Modulated Continuous Wave radar level meter on the market
- The only guarantee for measuring accurately in difficult conditions - even in tanks with agitated surfaces, foam, solids with dust, or internal objects
- Calibrated on the most modern and advanced calibration rig



## The universal radar solution

OPTIWAVE 7300 C is a non-contact Radar (FMCW) Level Meter for distance, level and volume measurement of liquids, pastes and solids. OPTIWAVE 7300 C gives a stabler measurement than pulse radar and is well suited to agitated process conditions.



- ① Touch screen with 4-button operation
- ② 2-wire level meter
- ③ Antenna extension (for long nozzles)
- ④ Rotatable housing
- ⑤ Optional Metaglas barrier
- ⑥ Same housing for Ex d and non-Ex

## Highlights

- $\pm 3$  mm /  $\pm 0.04$ " standard accuracy
- Reliable measurement in difficult process conditions
- Operates up to 200°C / 390°F and 40 bar / 580 psig
- Measurement range: 80 m / 260 ft
- Long antenna versions can be extended to suit any nozzle length
- PACTware and DTMs included as standard
- Optional second current output used for transmitting other measurement information such as reflectivity
- Directly accessible graphic touchscreen
- Triple barrier gas-tight protection available for working with dangerous gases (using pre-stressed fused glass)

## Industries

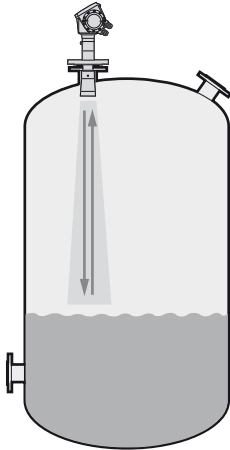
- Chemicals
- Food & Beverage
- Iron, Steel & Metals
- Minerals & Mining
- Oil & Gas
- Petrochemicals
- Pulp & Paper
- Water
- Wastewater

## Applications

- Tanks with agitators
- Process tanks
- Storage silos

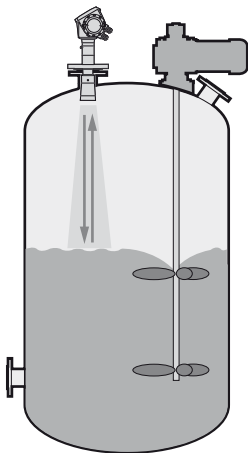
## Applications

### 1. Level measurement of liquids in storage tanks



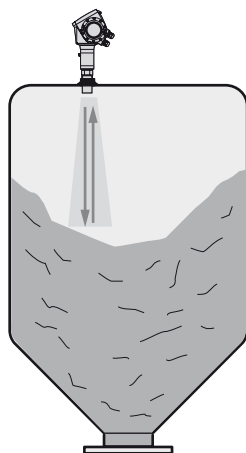
OPTIWAVE 7300 C can measure the level of a wide range of liquid products on a large variety of installations, including LPG and LNG tanks. It does not require calibration or commissioning when installed. It can measure any liquid within the stated pressure and temperature range, and distances up to 80 m / 260 ft.

### 2. Level measurement of liquids in process tanks



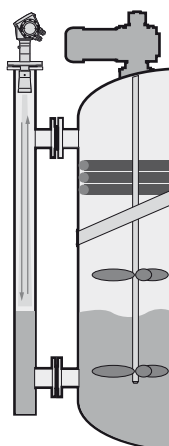
OPTIWAVE 7300 C can measure level accurately in agitated conditions, such as near to vortices caused by agitators, and also where foam is present.

### 3. Level measurement of solids



OPTIWAVE 7300 C is also able to measure solids with a dielectric constant as low as 1.5.

### 4. Measurement of liquids in a bypass chamber



If the tank is full of obstructions such as agitators and reinforcements, KROHNE recommends installing the OPTIWAVE 7300 C in a bypass chamber or a stilling well. This solution is also available from KROHNE under the name **BM 26 W**. The **BM 26 W** combines the **BM 26** with the OPTIWAVE 7300 C with the advantage of having a permanent, local indication without a power supply. Please refer to the **BM 26 W** Technical Datasheet for further information.

## Technical data

### Input

Function	K-band FMCW radar
Parameter	Level, distance, volume and reflectivity
Min. tank height	0.2 m / 8"
Max. measuring range	80 m / 260 ft
Blocking distance	Antenna extension length + antenna length + 0.1 m / 4"

### Output

Output signal (Output 1)	4...20 mA HART® or 3.8...20.5 mA acc. to NAMUR NE 43
Output signal (Output 2)	4...20 mA (no HART® signal) or 3.8...20.5 mA acc. to NAMUR NE 43
Resolution	±3 µA
Temperature drift	Typically 50 ppm/K
Error signal	High: 22 mA; Low: 3.6 mA acc. to NAMUR NE 43

### Reference conditions acc. to EN 60770

Temperature	+20°C ±5°C / +70°F ±10°F
Pressure	1013 mbar abs. ±20 mbar / 14.69 psig ±0.29 psig
Relative air humidity	60% ±15%
Reference target	Metal plate in an anechoic chamber

### Accuracy

Resolution	1 mm / 0.04"
Repeatability	±1 mm / ±0.04"
Accuracy	±3 mm / ±0.12", when distance < 10 m / 33 ft; ±0.03% of measured distance, when distance > 10 m / 33 ft
Beam angle - DN40 antenna	20°
Beam angle - DN50 antenna	15°
Beam angle - DN80 antenna	10°

### Process conditions

Ambient temperature	-40...+80°C / -40...+175°F (EEx i: see supplementary operating instructions or approval certificates)
Storage temperature	-40...+85°C / -40...+185°F
Flange temperature	-40...+200°C / -40...+390°F (EEx i: see supplementary operating instructions or approval certificates)
Thermal shock resistance	100°C/min
Operating pressure	-1...40 bar / -14.5...580 psig; subject to process connection used and flange temperature
Dielectric constant (εr)	≥1.5
Vibration resistance	IEC 68-2-6 and EN 50178 (10...57 Hz: 0.075 mm / 57...150 Hz:1g)
Protection category	IP 66/67 equivalent to NEMA 6-6X

## Material

Housing	Aluminium
Wetted parts	Stainless steel (1.4404 / 316L); Hastelloy® C-22 (2.4602)
Process fitting	Stainless steel (1.4404 / 316L); Hastelloy® C-22 (2.4602)
Gaskets	FKM/FPM (-40...+200°C / -40...+390°F); Kalrez® 6375 (-20...+200°C / -5...+390°F)
Feedthrough	PEI/standard (-40...+200°C / -40...+390°F); Metaglas® (-30...+200°C / -20...+390°F)
Weather protection (Option)	Stainless steel (1.4301 / 304)

## Process connections

Thread	G 1½"; NPT 1½"
Flange	DN40...150 (PN40 / PN16); 1½"...8" (150 lb / 300 lb); 10K (40...100A)

## Electrical connections

Instrument terminal 1 - Non-Ex / EEx i versions	14...30 VDC ①
Instrument terminal 1 - EEx d version	20...36 VDC ①
Instrument terminal 2 - Non-Ex / EEx i / EEx d versions	10...30 VDC ②
Cable entry	M20x1.5; NPT ½"; G ½" (not for FM- and CSA-approved devices)
Cable tightening capacity	0.5...1.5 mm²

## Human machine interface

Display	9 lines, 160 x 160 pixels in 8-step greyscale with 4-button keypad
Operating languages	English and a 2nd language: German, French, Italian, Spanish, Portuguese, Japanese, Chinese (Mandarin) or Russian

## Approvals

ATEX	ATEX II 1, 1/2, 2 G/D EEx ia IIC T6...T3 IP 6x; ATEX II 1/2, 2 G/D EEx d [ia] IIC T6...T3 IP 6x; ATEX II 3 G EEx nA IIC T6...T3
IECEX	Ex iaD 21 T 65...T 90 IP 6X; Ex ia IIC T6...T4 IP 66
FM or CSA	
NEC 500/ CEC	Cl. I, Div. 1, Gr. ABCD (IS); Cl. I, Div. 1, Gr. ABCD (FM only) (XP); Cl. I, Div. 2, Gr. ABCD (XP/NI); Cl. II, Div. 1, Gr. EFG; Cl. III (FM only) (XP); Cl. II Div. 1, Gr. EFG; Cl. III (IS); Cl. II/III, Div. 2, Gr. FG (XP/NI)
NEC 505/ CEC	Cl. I, Zone 0 AEx ia Gr. IIC (CSA: Ex ia) (IS); Cl. I, Zone 1 AEx d [ia] Gr. IIC (XP); Cl. I, Zone 2, AEx nA [ia], Gr. IIC (CSA: Ex nA [ia]) (IS)
NEPSI	Ex dia IIC T3...T6; Ex ia IIC T3...T6
WHG	In conformity with the German Federal Water Act
Other approvals	Gosstandard; PESO (India)

## Options and Accessories

Options	Integrated LCD display with sun cover;
	2nd current output;
	Antenna flushing system <sup>3</sup>
Accessories	Weather protection; Antenna extensions <sup>4</sup>

<sup>1</sup> min./max. value for an output of 22 mA at the terminal

<sup>2</sup> min./max. value for an output of 22 mA at the terminal (additional power supply needed - output only)

<sup>3</sup> supplied with NPTF ¼ connection (for long antenna versions only)

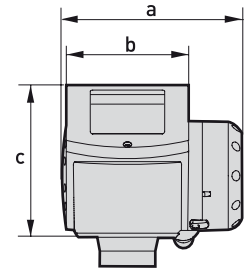
<sup>4</sup> for long antenna versions only

## Dimensions and Weight

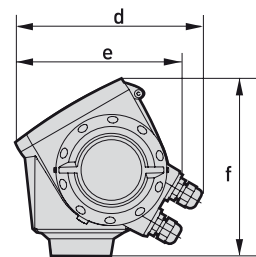
### Note:

- Cable glands are delivered on demand with non-Ex, EEx i- and EEx d-approved devices.
- Non-Ex and EEx i fittings are plastic and EEx d fittings are metallic. Non-Ex fittings are black and EEx i fittings are blue.
- The diameter of the outer sheath of the cable must be 6...12 mm or 0.2...0.5".
- Cable glands for FM- or CSA-approved devices must be supplied by the customer.

Housing front view



Housing right side



### Dimensions and Weight in mm and kg

	Dimensions [mm]						Weight [kg]
	a	b	c	d	e	f	
Housing	180	122	158.5	182 ①	167	190	3.3

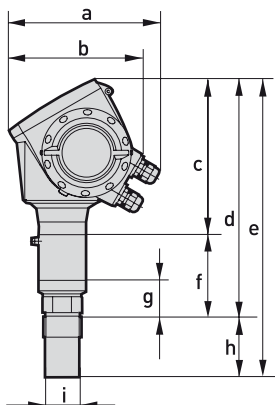
① if fitted with standard cable glands

### Dimensions and Weight in inches and lbs

	Dimensions [inches]						Weight [lbs]
	a	b	c	d	e	f	
Housing	7.1	4.8	6.2	7.2 ①	6.7	7.5	7.3

① if fitted with standard cable glands

Antenna with thread connection



Dimensions and Weight in mm and kg

	Dimensions [mm]									Weight [kg]
	a	b	c	d	e	f	g	h	i	
DN50 standard	182 ①	167	190	278	355	88	44.5	77	43 ②	6

① if fitted with standard cable glands

② 1½" NPT or G process connections available

Dimensions and Weight in inches and lbs

	Dimensions [inches]									Weight [lbs]
	a	b	c	d	e	f	g	h	i	
DN50 standard	7.2 ①	6.5	7.5	11.0	14.0	3.5	1.8	3.0	1.7 ②	13.2

① if fitted with standard cable glands

② 1½" NPT or G process connections available

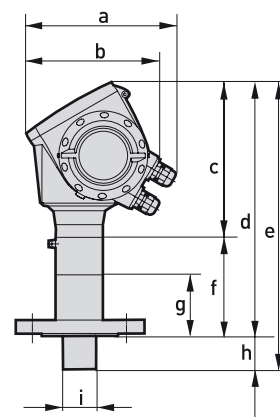
## Dimensions and Weight in mm and kg

	Dimensions [mm]									Weight [kg]
	a	b	c	d	e	f	g	h	i	
DN40 standard	182 ①	167	190	305	344	115	71.5	39	39	8
DN40 long	182 ①	167	190	305	590	115	71.5 ②	95	39	9
DN50 standard	182 ①	167	190	305	355.5	115	71.5	50.5	43	8
DN50 long	182 ①	167	190	305	411	115	71.5 ②	106	43	9

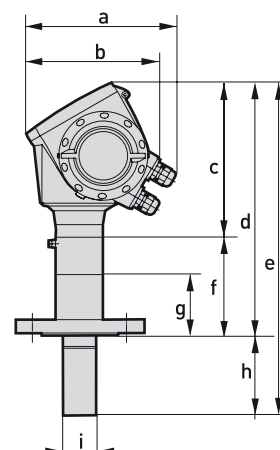
① if fitted with standard cable glands

② additional antenna extensions of 105 mm length are available

DN40/50 standard antenna



DN40/50 long antenna



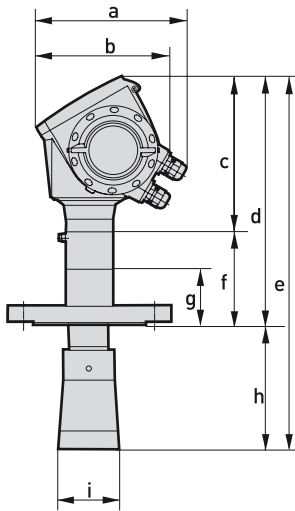
## Dimensions and Weight in inches and lbs

	Dimensions [inches]									Weight [lbs]
	a	b	c	d	e	f	g	h	i	
DN40 standard	7.2 ①	6.5	7.5	12.0	13.5	4.5	2.8	1.5	1.5	17.6
DN40 long	7.2 ①	6.5	7.5	12.0	23.2	4.5	2.8	3.7 ②	1.5	19.8
DN50 standard	7.2 ①	6.5	7.5	12.0	14.0	4.5	2.8	2.0	1.7	17.6
DN50 long	7.2 ①	6.5	7.5	12.0	16.2	4.5	2.8	4.2 ②	1.7	19.8

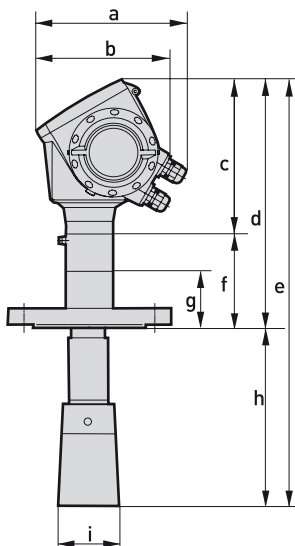
① if fitted with standard cable glands

② additional antenna extensions of 4.1" length are available

DN80 standard antenna



DN80 long antenna



Dimensions and Weight in mm and kg

	Dimensions [mm]									Weight [kg]
	a	b	c	d	e	f	g	h	i	
DN80 standard	182 ①	167	190	305	465	115	71.5	160.5	75	11
DN80 long	182 ①	167	190	305	523	115	71.5	216 ②	75	12

① if fitted with standard cable glands

② additional antenna extensions of 105 mm length are available

Dimensions and Weight in inches and lbs

	Dimensions [inches]									Weight [lbs]
	a	b	c	d	e	f	g	h	i	
DN80 standard	7.2 ①	6.5	7.5	12.0	18.3	4.5	2.8	6.3	3.0	24.3
DN80 long	7.2 ①	6.5	7.5	12.0	20.5	4.5	2.8	8.5 ②	3.0	26.5

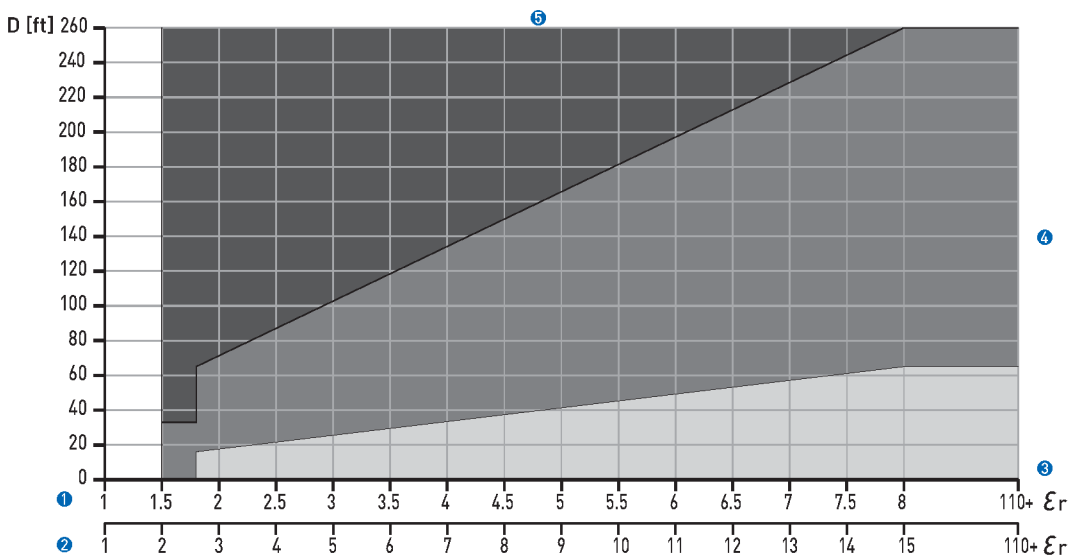
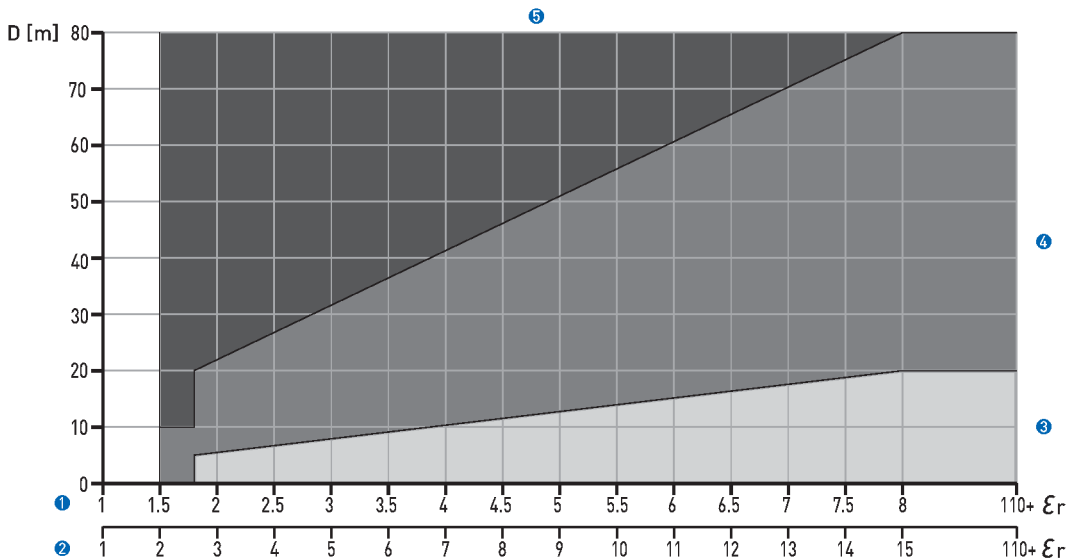
① if fitted with standard cable glands

② additional antenna extensions of 4.1" length are available

## Antenna selection: liquid applications

The graphs below show which antenna to select for the application based on:

D, the distance from the device flange facing to the surface of the product being measured, and  $\epsilon_r$ , is the dielectric constant of the product being measured



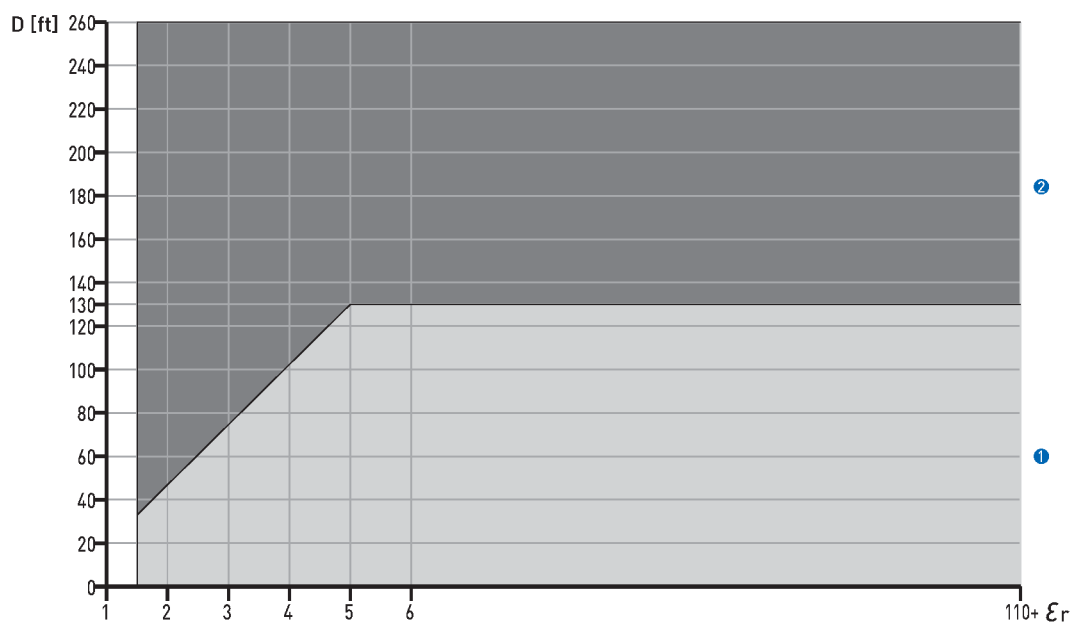
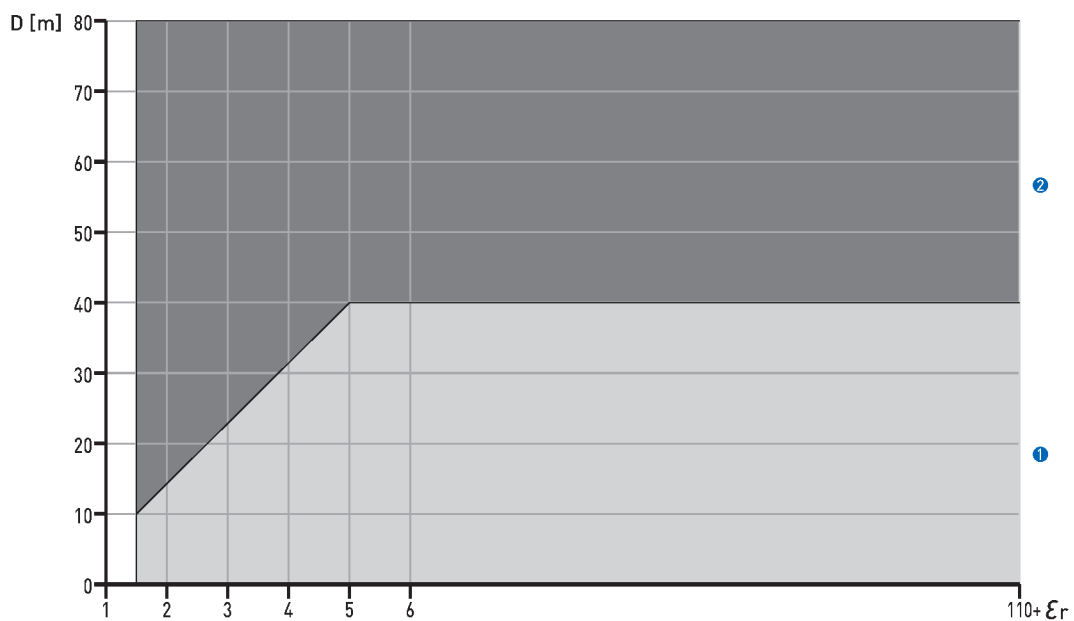
- ① X axis: dielectric constant range for storage/stillwell applications
- ② X axis: dielectric constant range for process/agitator applications
- ③ DN40, DN 50 or DN 80 antenna with or without a still well
- ④ DN 80 antenna with or without a still well
- ⑤ DN 80 antenna in a still well

## Antenna selection: solid applications

This graph shows which antenna to select for the application based on:

D, the distance from the device flange facing to the surface of the product being measured, and

$\epsilon_r$ , is the dielectric constant of the product being measured



① DN 80 antenna

② On request





## KROHNE Product Overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Mass flowmeters
- Ultrasonic flowmeters
- Vortex flowmeters
- Flow controllers
- Level measuring instruments
- Pressure gauges
- Temperature measuring instruments
- Water solutions & analysis
- Oil and gas turnkey solutions

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Greece  
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Hungary  
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Ireland  
Israel  
Ivory Coast  
Japan  
Jordan  
Kuwait  
Libya  
Lithuania  
Malaysia  
Mauritius  
Mexico  
Morocco  
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Peru  
Portugal  
Romania  
Saudi Arabia  
Senegal  
Slovakia  
Slovenia  
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Venezuela  
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