



## OPTIWAVE 7300 C Technical Datasheet

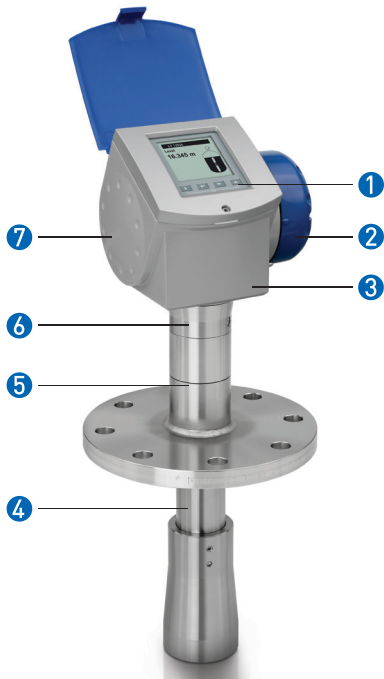
### Non-contact Radar (FMCW) Level Meter

- One converter for all applications
- The only guarantee for measuring accurately in difficult conditions - even in tanks with agitated surfaces, foam, solids with dust, or internal objects
- Optionally equipped with a 4-button touch screen display and an easy-to-use setup wizard



## 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 Optional touch screen with 4-button operation
- ② 2-wire level meter
- ③ One converter for all applications
- ④ Antenna extension (for long nozzles)
- ⑤ Optional Metaglas barrier
- ⑥ Rotatable housing
- ⑦ 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 a flange temperature of 200°C / 390°F and 40 bar / 580 psig
- Measuring range up to 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
- Directly-accessible graphic touchscreen/wizard (option)
- Converter rotates 360°
- Triple barrier gas-tight protection available for working with dangerous gases (using pre-stressed fused glass)

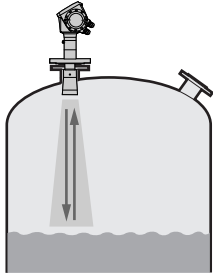
## Industries

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

## Applications

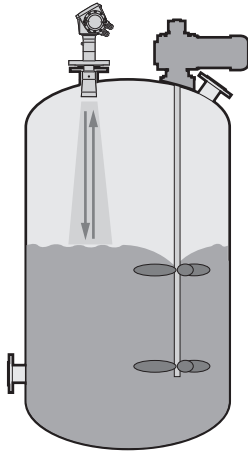
- Tanks with agitators
- Process tanks
- Storage tanks and silos

## Applications



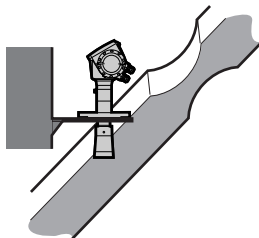
### 1. Level measurement of liquids in storage tanks

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.



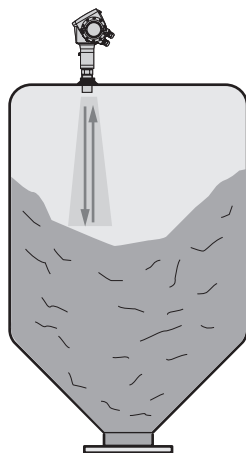
### 2. Level measurement of liquids in process tanks

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



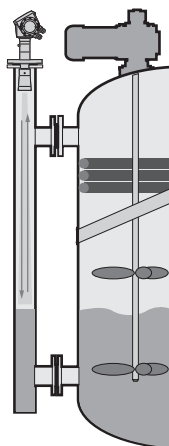
### 3. Open channel metering or flow

OPTIWAVE 7300 C can measure level in an open channel and convert this measurement into flow values if the characteristics of the channel are known. This solution is the high end alternative to ultrasonic and hydrostatic pressure transmitters.



#### 4. Level measurement of solids

OPTIWAVE 7300 C is also able to measure solids with a dielectric constant as low as 1.5. It has been successfully used in applications such as mineral powder and granulates (cement, lime, calcium carbonate, ...), as well as plastic pellets (PP, PE, PVC, ...) and wood chips.



#### 5. 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°
Beam angle - DN100 antenna	8°

### 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 (ε <sub>r</sub> )	≥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 (option)

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

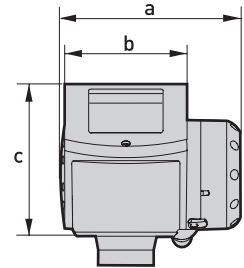
<sup>④</sup> for long antenna versions only

## Dimensions and Weight

### Note:

- Cable glands are delivered on demand with non-Ex, EEx i- and EEx d-approved devices.
- Cable glands for FM- or CSA-approved devices must be supplied by the customer.
- A weather protection cover is delivered on demand with all devices

Housing front view

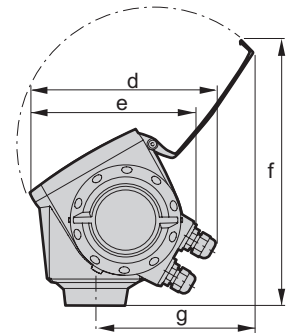


### Dimensions in mm and kg

	Dimensions [mm]							Weight [kg]
	a	b	c	d	e	f	g	
Housing	180	122	158.5	182 <sup>①</sup>	167	277	155	3.3

① if fitted with standard cable glands

Housing right side



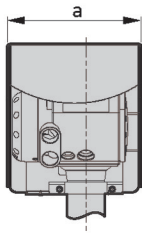
### Dimensions in inches and lbs

	Dimensions [inches]							Weight [lbs]
	a	b	c	d	e	f	g	
Housing	7.1	4.8	6.2	7.2 <sup>①</sup>	6.7	10.9	6.1	7.3

① if fitted with standard cable glands



Weather protection back view



Dimensions and Weight in mm and kg

	Dimensions [mm]				Weight [kg]
	a	b	c	d	
Weather protection	208	231.5	268 ①	66	2.9

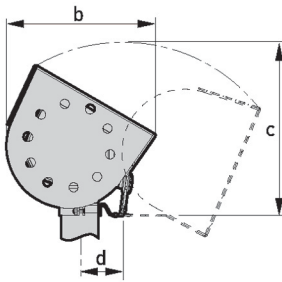
① radius

Dimensions and Weight in inches and lbs

	Dimensions [inches]				Weight [lbs]
	a	b	c	d	
Weather protection	8.2	9.1	10.6 ①	2.6	6.4

① radius

Weather protection left side



## 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

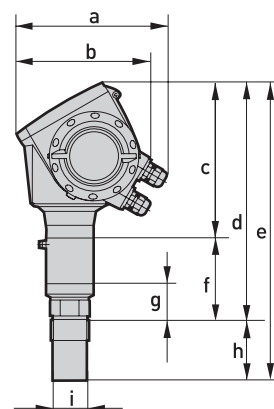
## Dimensions and Weight in inches and lbs

	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

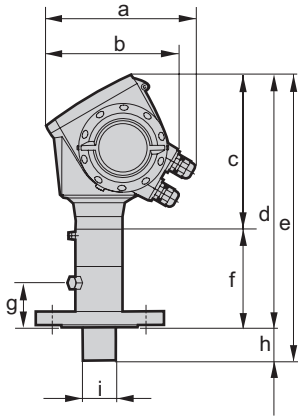
① if fitted with standard cable glands

② 1½" NPT or G process connections available

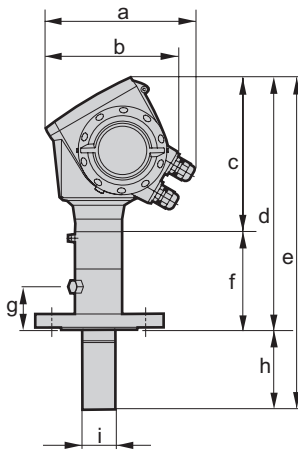
Antenna with thread connection



DN40/50 standard antenna



DN40/50 long antenna



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	50 ②	39	39	8
DN40 long	182 ①	167	190	305	590	115	50 ②	95 ③	39	9
DN50 standard	182 ①	167	190	305	355.5	115	50 ②	50.5	43	8
DN50 long	182 ①	167	190	305	411	115	50 ②	106 ③	43	9

- ① if fitted with standard cable glands
- ② antenna flushing system delivered on demand (NPTF ¼ connection)
- ③ 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	
DN40 standard	7.2 ①	6.5	7.5	12.0	13.5	4.5	2.0 ②	1.5	1.5	17.6
DN40 long	7.2 ①	6.5	7.5	12.0	23.2	4.5	2.0 ②	3.7 ③	1.5	19.8
DN50 standard	7.2 ①	6.5	7.5	12.0	14.0	4.5	2.0 ②	2.0	1.7	17.6
DN50 long	7.2 ①	6.5	7.5	12.0	16.2	4.5	2.0 ②	4.2 ③	1.7	19.8

- ① if fitted with standard cable glands
- ② antenna flushing system delivered on demand (NPTF ¼ connection)
- ③ additional antenna extensions of 4.1" length are available

## 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	50 ②	160.5	75	11
DN80 long	182 ①	167	190	305	523	115	50 ②	216 ③	75	12

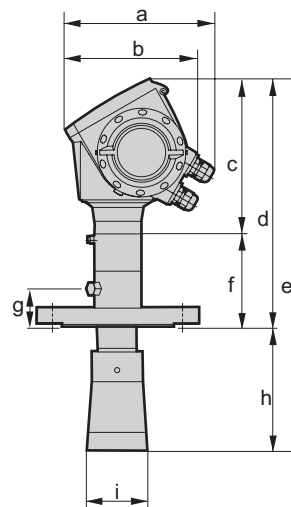
- ① if fitted with standard cable glands
- ② antenna flushing system delivered on demand (NPTF ¼ connection)
- ③ additional antenna extensions of 105 mm length are available

## Dimensions and Weight in inches and lbs

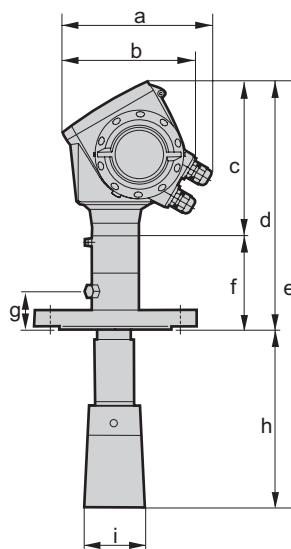
	Dimensions [inches]									Weight [lbs]
	a	b	c	d	e	f	g	h	i	
DN80 standard	7.2 ①	6.5	7.5	12.0	18.3	4.5	2.0 ②	6.3	3.0	24.3
DN80 long	7.2 ①	6.5	7.5	12.0	20.5	4.5	2.0 ②	8.5 ③	3.0	26.5

- ① if fitted with standard cable glands
- ② antenna flushing system delivered on demand (NPTF ¼ connection)
- ③ additional antenna extensions of 4.1" length are available

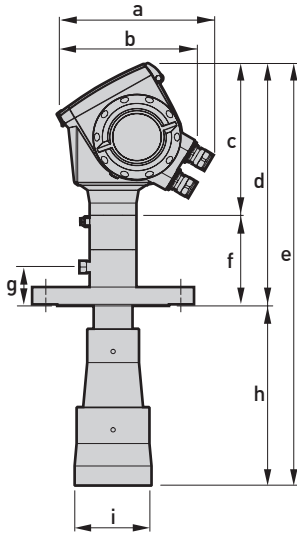
DN80 standard antenna



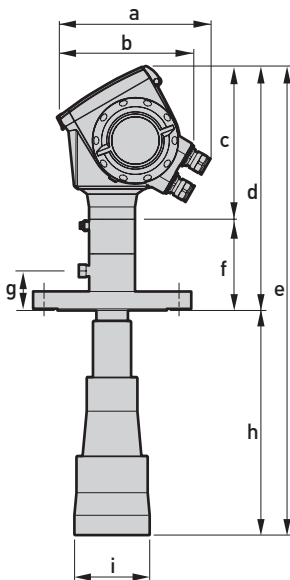
DN80 long antenna



DN100 standard antenna



DN100 long antenna



Dimensions and Weight in mm and kg

	Dimensions [mm]									Weight [kg]
	a	b	c	d	e	f	g	h	i	
DN100 standard	182 ①	167	190	305	465	115	71.5 ②	229	95	18
DN100 long	182 ①	167	190	305	523	115	71.5 ②	284 ③	95	19

- ① if fitted with standard cable glands
- ② antenna flushing system delivered on demand (NPTF ¼ connection)
- ③ additional antenna extensions of 105 mm length are available

Dimensions and Weight in inches and lbs

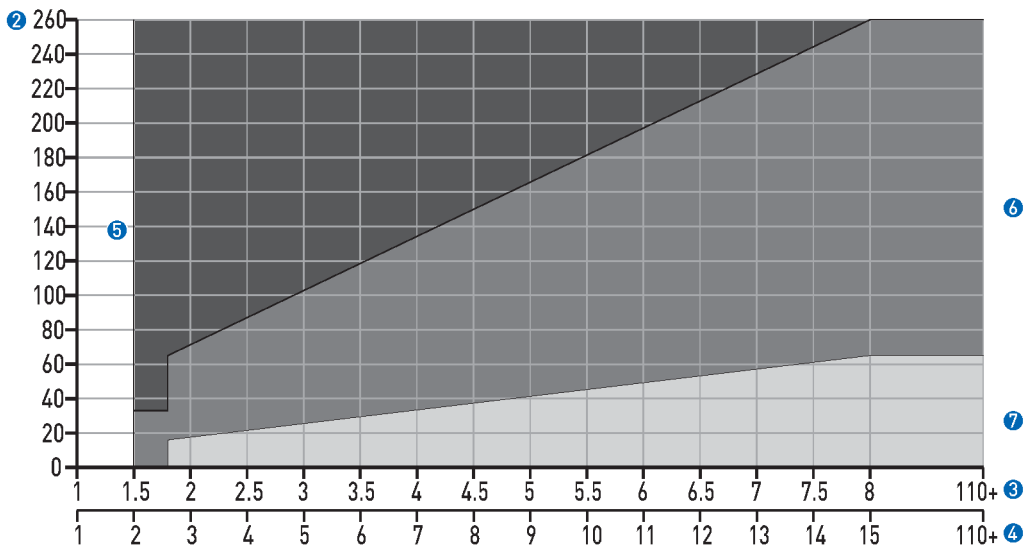
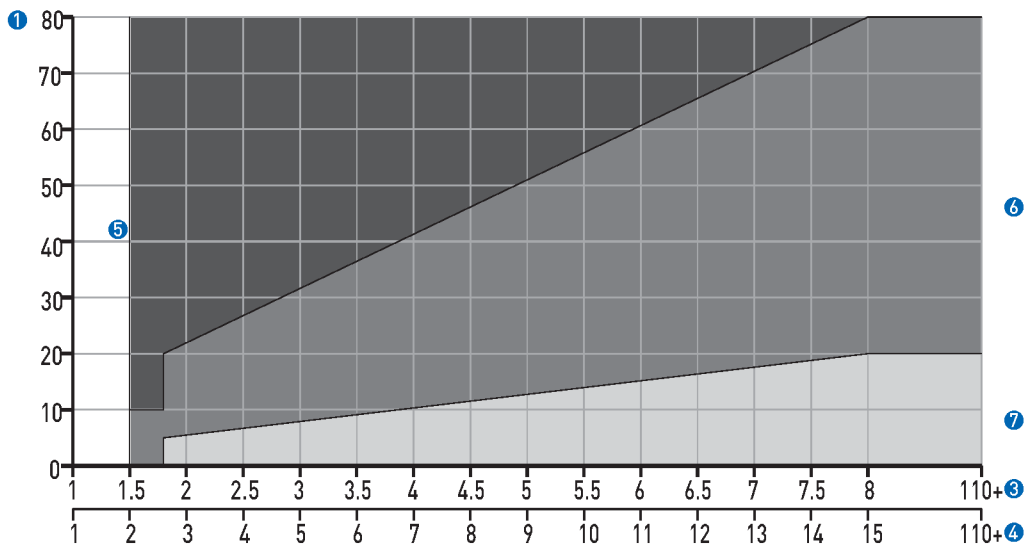
	Dimensions [inches]									Weight [lbs]
	a	b	c	d	e	f	g	h	i	
DN100 standard	7.2 ①	6.5	7.5	12.0	18.3	4.5	2.8 ②	9.0	3.7	40
DN100 long	7.2 ①	6.5	7.5	12.0	20.5	4.5	2.8 ②	11.2 ③	3.7	42

- ① if fitted with standard cable glands
- ② antenna flushing system delivered on demand (NPTF ¼ connection)
- ③ 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 measuring range,
- $\epsilon_r$ , is the dielectric constant of the product being measured and
- the application.

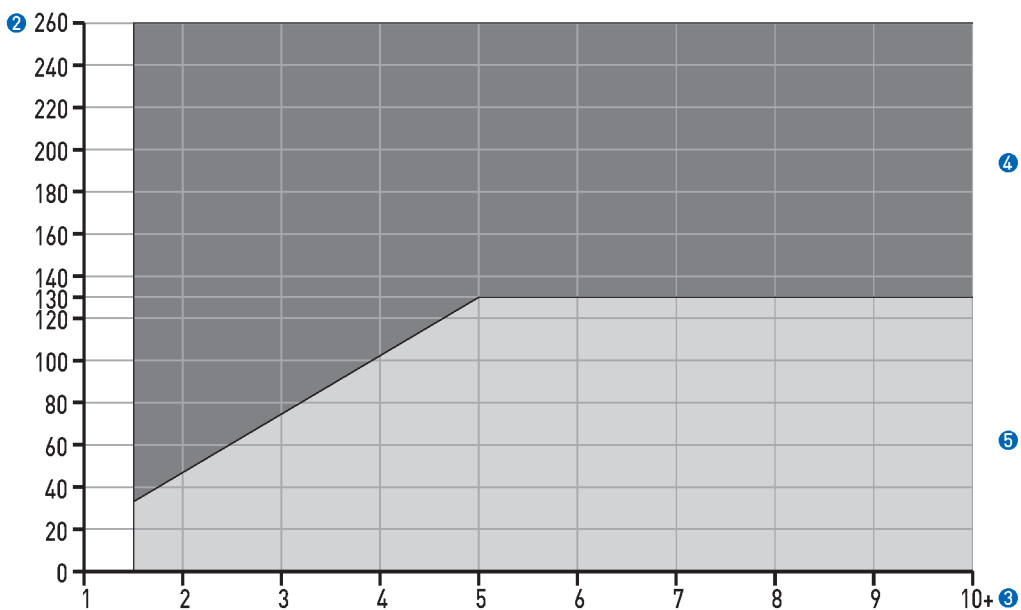
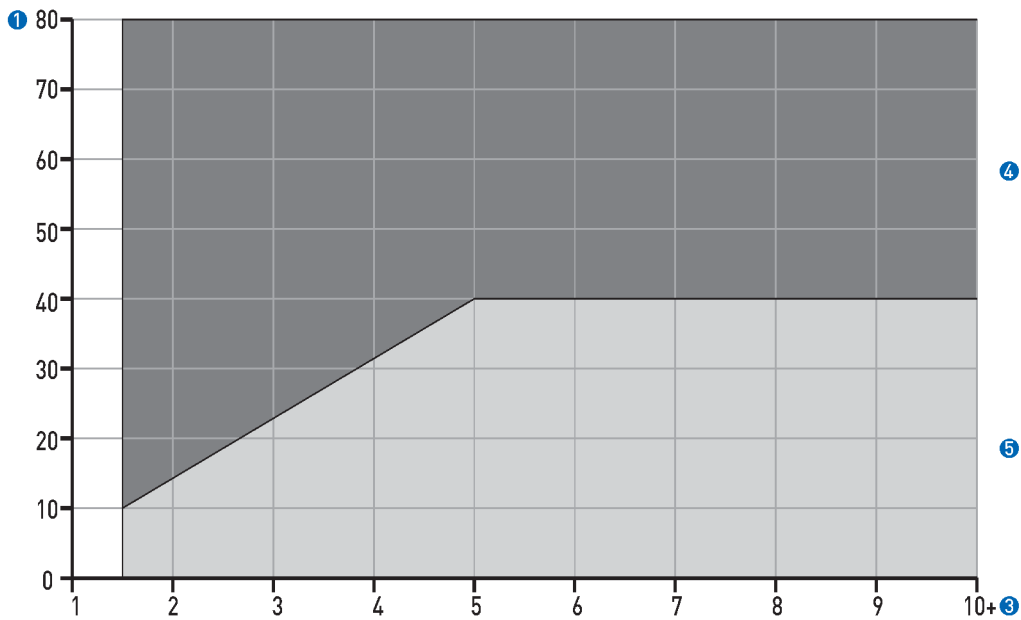


- 1 Distance, D [m]
- 2 Distance, D [ft]
- 3 Dielectric constant ( $\epsilon_r$ ) range for storage/stillwell applications
- 4 Dielectric constant ( $\epsilon_r$ ) range for process/agitator applications
- 5 DN 80 or DN 100 antenna in a still well
- 6 DN 80 or DN 100 antenna with or without a still well
- 7 DN40, DN 50, DN 80 or DN 100 antenna with or without a still well

## Antenna selection: solid applications

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

- D, the measuring range,
- $\epsilon_r$ , is the dielectric constant of the product being measured and
- the application.



- ① Distance, D [m]
- ② Distance, D [ft]
- ③ Dielectric constant ( $\epsilon_r$ )
- ④ On request
- ⑤ DN 80 or DN 100 antenna

## 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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