



## OPTIFLEX 1300 C Technical Datasheet

### Guided Radar (TDR) Level Meter

- Higher signal dynamics and sharper pulses improve accuracy
- Reliable measurement even in tanks with agitated surfaces, foam or deposits on the probe
- Easy navigation via touch screen
- PACTware and DTMs included as standard
- Measures down to dielectric constant of 1.1



## The superior TDR solution

OPTIFLEX 1300 C has higher signal dynamics than conventional radar devices and therefore better reproducibility and accuracy. OPTIFLEX 1300 C is a Guided Radar (TDR) Level Meter for distance, level and volume of liquids, pastes, solids and liquid/liquid interface.



- ① Touch screen with 4-button operation
- ② 2-wire level meter
- ③ Same housing for Ex and non-Ex
- ④ Display in 9 languages

## Highlights

- Optimal process safety
- Reliable measurement even in tanks with agitated surfaces, foam or deposits on the probe
- Installation wizard
- Easy navigation via touch screen
- PACTware and DTMs included as standard
- Optional second current output - used for displaying interface measurements, for example
- Measures down to dielectric constant of 1.1
- Display in 9 languages: even in Chinese, Japanese and Russian

## Industries

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

## Applications

- Level measurement in process tanks
- Distillation tank
- Expansion tank; level control in cooling circuits

## Level product range

### Continuous measurement



- ❶ OPTIFLEX 1300 C: The superior TDR solution
- ❷ OPTIWAVE 7300 C: The high-performance radar solution
- ❸ BM 26 A: The reliable float solution for liquids
- ❹ BM 26 W/F: The bypass solution integrating either TDR (F) or radar (W) technology
- ❺ OPTISOUND 3000 C: The ultrasonic solution for liquids and solids

### Switches



- ❶ OPTISWITCH 3000 C: The vibration switch for solids
- ❷ OPTISWITCH 5000 C: The vibration switch for liquids
- ❸ LS 6000: The electromagnetic limit switch for detecting the level of liquids and pastes
- ❹ LS 7000: The conductive level switch for liquids

### Other Products



- ❶ BM 70 A/P: The reliable and precise radar solutions.
- ❷ BM 702: The economical radar solution
- ❸ BM 70 M: The marine and offshore radar solution
- ❹ BW 25: The displacer-type level indicator for high-temperature and high-pressure applications
- ❺ BM 500: The potentiometric solution for hygienic applications

## Technical Data

### Input

Function	Time Domain Reflectometry (TDR)
Parameter	Level, distance, volume and/or interface
Max. measuring range	
Double rod Ø8 mm / 0.3"	4 m / 13 ft
Single rod Ø8 mm / 0.3"	4 m / 13 ft
Coaxial Ø22 mm / 0.9"	6 m / 20 ft
Double cable Ø4 mm / 0.15"	8 m / 26 ft
Single cable Ø4 mm / 0.15"	35 m / 115 ft
Single cable Ø8 mm / 0.3"	35 m / 115 ft

### 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
Max. Load	350 ohms (at 20.5 mA with a supply voltage of 17 VDC)

### 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%

### Accuracy

Repeatability	±1 mm / ±0.04"
Resolution	±1 mm / ±0.04"
Accuracy (in direct mode)	
Liquids	±3 mm / ±0.12", when distance < 10 m / 33 ft; ±0.03% of measured distance, when distance > 10 m / 33 ft
Powders	±20 mm / ±0.8"
Interface	±10 mm / ±0.4" ( $\epsilon_r$ constant)
Accuracy (in TBF mode)	±20 mm / ±0.8" ( $\epsilon_r$ constant)
Minimum layer (interface)	50 mm / 2"

### 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 ( $\epsilon_r$ )	
Level in direct mode	≥1.4 for coaxial probe; ≥1.6 for single and double probes
Interface in direct mode	$\epsilon_r(\text{interface}) \gg \epsilon_r(\text{level})^2$
Level in TBF mode	≥1.1
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
Single rod	Stainless steel (1.4404 / 316 L); Hastelloy® C-22 (2.4602)
Double rod	Stainless steel (1.4404 / 316 L); Hastelloy® C-22 (2.4602)
Coaxial	Stainless steel (1.4404 / 316 L); Hastelloy® C-22 (2.4602)
Single cable	Stainless steel (1.4401 / 316 L); Hastelloy® C-22 (2.4602) (only cable Ø4 mm / 0.15")
Double cable	Stainless steel (1.4401 / 316)
Process fitting	Stainless steel (1.4404 / 316L); Hastelloy® C-22 (2.4602)
Gaskets	Viton® [-40...+200°C / -40...+390°F]; Kalrez® 6375 [-20...+200°C / -5...+390°F]
Weather protection (Option)	Stainless steel (1.4301 / 304)
Conduit for remote housing (Option)	Zinc-coated steel in a PVC sheath [-40...+105°C/-40...+220°F]

## Process connections

Thread	G ¾...1½; NPT ¾...1½
Flange	DN25...150 (PN40 / PN16); 1" ...8" (150 lb / 300 lb); 10K (40...100A)

## Electrical connections

Terminals output 1 - Non-Ex / EEx i	24 VDC (14...30 VDC)
Terminals output 1 - EEx d	24 VDC (20...36 VDC)
Terminals output 2 - Non-Ex/ EEx i/ EEx d	24 VDC (10...30 VDC)
Cable entry	M20x1.5; NPT ½"; G ½" (not for FM- and CSA-approved devices)
Terminals	0.5...1.5 mm²

## User 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

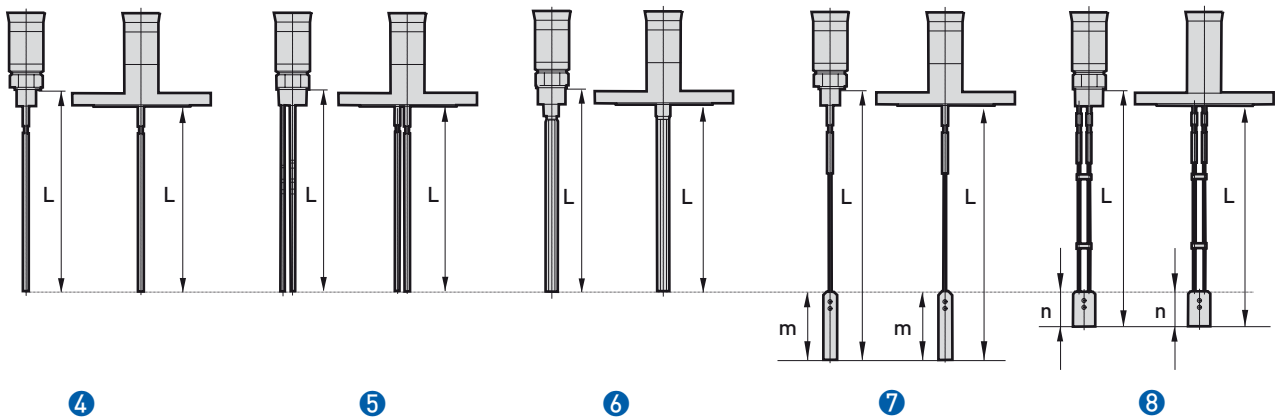
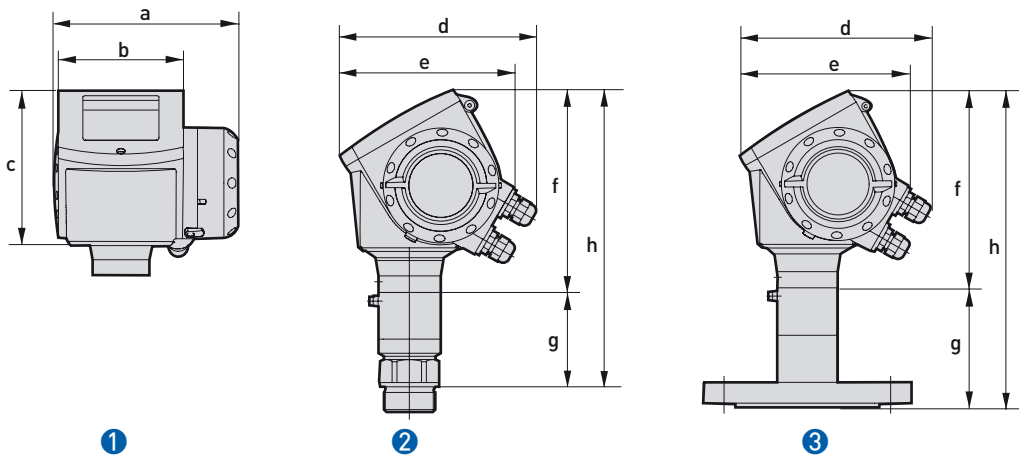
ATEX	ATEX II G/D 1, 1/2, 2 EEx ia IIC T6...T3; ATEX II G/D 1/2, 2 EEx d [ia] IIC T6...T3
FM or CSA	
NEC 500/ CEC	Cl. I, Div. 1, Gr. ABCD (IS); Cl. I, Div. 1, Gr. ABCD (FM only) (XP); Cl. I, Div. 2, Gr. ABCD (XP/NI); Cl. II, Div. 1, Gr. EFG; Cl. III (FM only) (XP); Cl. II Div. 1, Gr. EFG; Cl. III (IS); 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)
WHG (pending)	Overfill protection

## Options and Accessories

Options	Integrated LCD display; 2nd current output; Remote housing connected to the probe via a flexible conduit ①
	Standard lengths: 2180 mm / 7 ft, 4720 mm / 15.5 ft, 9800 mm / 32 ft and 4880 mm / 16 ft
Accessories	Weather protection

① ATEX, FM and CSA approvals pending

## Dimensions and Weights



- 1 Converter (front view)
- 2 Thread version (right side)
- 3 Flange version (right side)
- 4 Single rod  $\varnothing 8$  mm /  $\varnothing 0.3$ " (thread and flange versions)
- 5 Double rod  $\varnothing 8$  mm /  $\varnothing 0.3$ " (thread and flange versions)
- 6 Coaxial  $\varnothing 22$  mm /  $\varnothing 0.9$ " (thread and flange versions)
- 7 Single cable  $\varnothing 4$  mm /  $\varnothing 0.15$ " or  $\varnothing 8$  mm /  $\varnothing 0.3$ " (thread and flange versions)
- 8 Double cable  $\varnothing 4$  mm /  $\varnothing 0.15$ " (thread and flange versions)

**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.

**Note:**

Wide range of counterweights and anchoring solutions available. Contact KROHNE for further information.

## Dimensions and Weights in mm and kg

	Dimensions [mm]											Weight [kg]
	a	b	c	d	e	f	g	h	L	m	n	
Housing	180	122	158.5	182 ①	170	190	-	-	-	-	-	3.3
Flange DN25...80	180	122	158.5	182 ①	170	190	126.5	316.5	-	-	-	4...7
Flange DN100...150	180	122	158.5	182 ①	170	190	126.5	316.5	-	-	-	7...12
Thread	180	122	158.5	182 ①	170	190	99	289	-	-	-	3
Probes	180	122	158.5	182 ①	170	190	-	-	②	100 / 0 ③	60	④

- ① if fitted with standard cable glands
- ② ordered probe length, L: see technical data, also max. measuring range, page 4
- ③ Ø4 mm / Ø8 mm
- ④ see table: Probe weight

## Dimensions and Weights in inches and lbs

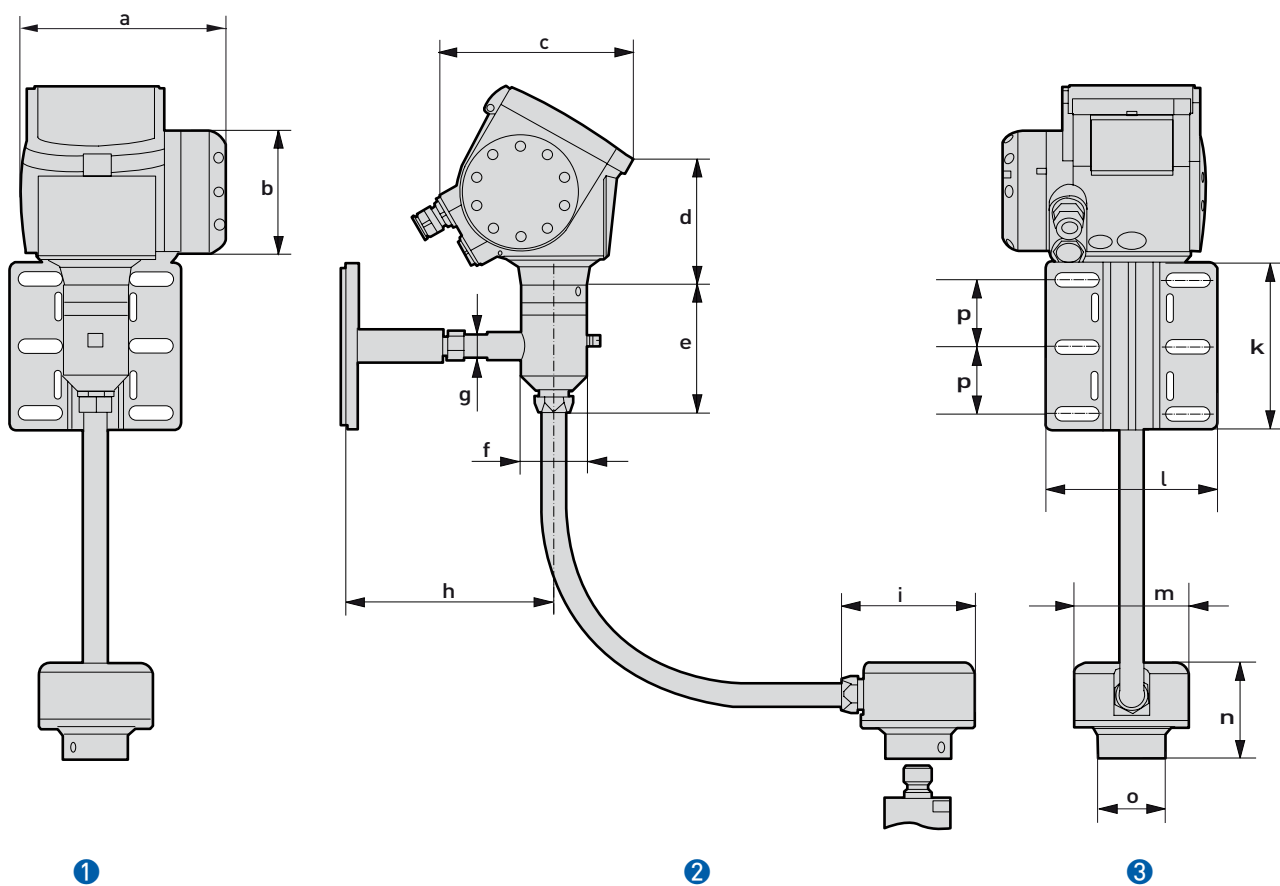
	Dimensions [inches]											Weight [lbs]
	a	b	c	d	e	f	g	h	L	m	n	
Housing	7.1	4.8	6.2	7.2 ①	6.7	7.5	-	-	-	-	-	7.3
Flange ASME1...3	7.1	4.8	6.2	7.2 ①	6.7	7.5	5.0	12.5	-	-	-	8.8...15.4
Flange ASME4...8	7.1	4.8	6.2	7.2 ①	6.7	7.5	5.0	12.5	-	-	-	15.4...26.5
Thread	7.1	4.8	6.2	7.2 ①	6.7	7.5	3.9	11.4	-	-	-	6.6
Probes	7.1	4.8	6.2	7.2 ①	6.7	7.5	-	-	②	4.0 / 0 ③	2.4	④

- ① if fitted with standard cable glands
- ② ordered probe length, L: see technical data, also max. measuring range, page 4
- ③ Ø0.15" / Ø0.3"
- ④ see table: Probe weight

## Probe weight

Probes	Min. process connection size		Weight	
	Thread	Flange	[kg/m]	[lbs/ft]
Single cable Ø4 mm / 0.15"	G ¾A; NPT ¾	DN25 PN40; 1" 150 lb; 1½" 300 lb	0.12	0.08
Single cable Ø8 mm / 0.3"	G 1½A; NPT 1½	DN40 PN40; 1½" 150 lb; 2" 300 lb	0.41	0.28
Double cable Ø4 mm / 0.15"	G 1½A; NPT 1½	DN50 PN40; 2" 150 lb; 2" 300 lb	0.24	0.16
Single rod Ø8 mm / 0.3"	G ¾A; NPT ¾	DN25 PN40; 1" 150 lb; 1½" 300 lb	0.41	0.28
Double rod Ø8 mm / 0.3"	G 1½A; NPT 1½	DN50 PN40; 2" 150 lb; 2" 300 lb	0.82	0.56
Coaxial Ø22 mm / 0.9"	G ¾A; NPT ¾	DN25 PN40; 1" 150 lb; 1½" 300 lb	0.79	0.53

## Remote version



- ① Front view
- ② Left side
- ③ Rear view

## Dimensions and Weights in mm and kg

	Dimensions [mm]															Weight [kg]
	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	
Remote version	180	109	165	193	98.5	58	21	183	117	150	150.4	100	86	58	60	6.6...12.85

① wall bracket (1.4 kg) + housing support (1.5 kg) + remote probe housing (2.7 kg) + flexible conduit (2 m: 1 kg; 4.5 m: 2.25 kg; 9.5 m: 4.75 kg; 14.5 m: 7.25 kg)

## Dimensions and Weights in inches and lbs

	Dimensions [inches]															Weight [lbs]
	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	
Remote version	7.09	4.29	6.50	7.60	3.88	2.28	0.83	7.20	4.60	5.91	5.92	3.94	3.39	2.28	2.36	14.6...28.3

① wall bracket (3.1 lbs) + housing support (3.3 lbs) + remote probe housing (6.0 lbs) + flexible conduit (6.6 ft: 2.2 lbs; 14.8 ft: 5.0 lbs; 31.2 ft: 10.5 lbs; 47.6 ft: 16.0 lbs)



#### Remote version limits

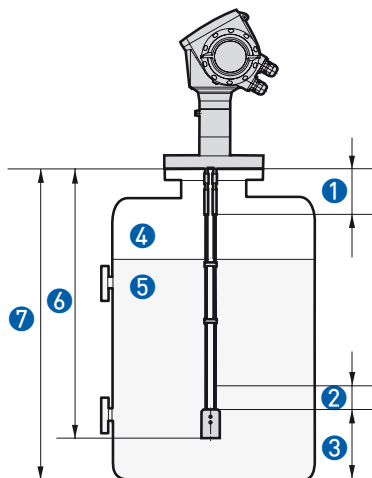
- For interface and solid (powder, granulate) applications the maximum the max. extension length is 4.5 m / 14.8 ft.
- For liquid level applications, the maximum measuring range is reduced according to the length between the flange and the converter.

Extension length		Max. measuring range	
[m]	[ft]	[m]	[ft]
2	6.6	30	98
4.5	14.8	25	82
9.5	31.2	15	29
14.5	47.6	5	16.4

#### Applications

- Tank with a lot of vibration
- Limited space on the top of the tank or limited access (due to the size of the compact converter)
- Remote display on the bottom of the tank

## Measurement limits



- ① A1, Blocking distance: Min. distance from flange to top limit of measuring range.
- ② A2, Bottom dead zone: Length at end of probe, where measurement is not possible.
- ③ D, non measurement zone: Zone where measurement cannot be taken.
- ④ Gas (Air)
- ⑤ Product 1
- ⑥ L, Probe length: Length specified by customer in the order.
- ⑦ Tank Height

### Measuring limits in mm

Probes	Blocking distance, A1 $\epsilon_r = 80$	Bottom dead zone, A2 $\epsilon_r = 80$	Blocking distance, A1 $\epsilon_r = 2.3$	Bottom dead zone, A2 $\epsilon_r = 2.3$
	[mm]			
Double rod	125	10	165	50
Single rod	200	10	250	50
Coaxial	10	10	10	50
Double cable	125	10	165	50
Single cable $\varnothing 8 \text{ mm} / \varnothing 0.3''$	200	10	250	50
Single cable $\varnothing 4 \text{ mm} / \varnothing 0.15''$	200	10	250	50

80 is  $\epsilon_r$  of water; 2.3 is  $\epsilon_r$  of oil

### Measuring limits in inches

Probes	Blocking distance, A1 $\epsilon_r = 80$	Bottom dead zone, A2 $\epsilon_r = 80$	Blocking distance, A1 $\epsilon_r = 2.3$	Bottom dead zone, A2 $\epsilon_r = 2.3$
	[inches]			
Double rod	4.90	0.40	6.50	1.95
Single rod	7.90	0.40	9.90	1.95
Coaxial	0.40	0.40	0.40	1.95
Double cable	4.90	0.40	6.50	1.95
Single cable $\varnothing 8 \text{ mm} / \varnothing 0.3''$	7.90	0.40	9.90	1.95
Single cable $\varnothing 4 \text{ mm} / \varnothing 0.15''$	7.90	0.40	9.90	1.95

80 is  $\epsilon_r$  of water; 2.3 is  $\epsilon_r$  of oil

## Probe selection

	Double rod	Single rod	Coaxial	Double cable	Single cable Ø8 mm / 0.3"	Single cable Ø4 mm / 0.15"

### Maximum probe length, L

4 m / 13 ft						
6 m / 20 ft						
8 m / 26 ft						
35 m / 115 ft						

### Liquids

Liquid application						
LPG, LNG						
Highly viscous liquids						
Highly crystallising liquids						
Highly corrosive liquids						
Foam						
Agitated liquids					①	①
Spray in tank						
Storage tanks						
Installation in bypass chamber						
Small diameter nozzles						
Long nozzles						
Stilling wells						
Interface measurement						②

### Solids

Powders						
Granules, <5 mm / 0.1"						

■ standard ■ optional □ on request

- ① with anchor fitting
- ② max. length is 20 m / 65.5 ft

## KROHNE 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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Ireland  
Israel  
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Jordan  
Kuwait  
Libya  
Lithuania  
Malaysia  
Mauritius  
Mexico  
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Slovenia  
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Thunisia  
Turkey  
Venezuela  
Yugoslavia

### Other countries

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