

Pressure sensor with wireless transmission For general industrial applications Model PEW-1000

WIKA data sheet PE 87.23



Applications

- Industrial pressure measurement for gases and liquids

Special features

- Low operating costs through intelligent measurement control
- Easy integration thanks to several radio standard options
- Numerous application possibilities – also as retrofit
- Robustly built, permanently reliable pressure measurement
- Risk minimisation through condition monitoring



Pressure sensor with wireless transmission, model PEW-1000

Description

The model PEW-1000 is a radio-based pressure sensor for monitoring liquids and gases. It uses the licence-free LoRaWAN® or mioty® and Bluetooth® radio standards and is used, for example, on mobile equipment and remote measuring points. Thanks to intelligent measurement and transmission control and a replaceable battery, the sensor can be operated for years without maintenance.

Low operating costs through intelligent measurement control

The intelligent configuration allows measurement and transmission intervals that are dependent on the measured value. In addition, the sensor can measure continuously without transmitting every measured value. This means: high security with low data and energy consumption. All data is available digitally in a cost-efficient way and allows automated analyses.

Easy integration thanks to several radio standard options

Thanks to numerous process connections and the two available standards – LoRaWAN® or mioty® for the kilometre range and Bluetooth® for the metre range – the pressure sensor can be flexibly configured.

Numerous application possibilities – also as retrofit

Via retrofit, machinery or moving parts can be configured smartly – without having to plan and document cable routing. Particularly when no continuous measurement is needed, cost advantages can be realised.

Robustly built, permanently reliable pressure measurement

The model PEW-1000 is built to be robust and shock-resistant. Thanks to IP65, it is well protected against dust and splash water. The battery is preassembled and can be replaced easily. It is not necessary to replace the entire pressure sensor.

Risk minimisation through condition monitoring

The sensor enables simple condition monitoring. A temperature indication, in addition to the pressure value, reveals possible malfunctions due to wear or system faults at an early stage and thus reduces the risk of downtime and damage.

Specifications

Overview of versions

Model PEW-1000 (Lxx)	Version with LoRaWAN® and Bluetooth®
Model PEW-1000 (Mxx)	Version with mioty® and Bluetooth®
Model PEW-1000 (Bxx)	Version with Bluetooth®

→ The fields marked with xx are the respective regional abbreviations of the permissible radio standards, for further information, see product label or operating instructions.

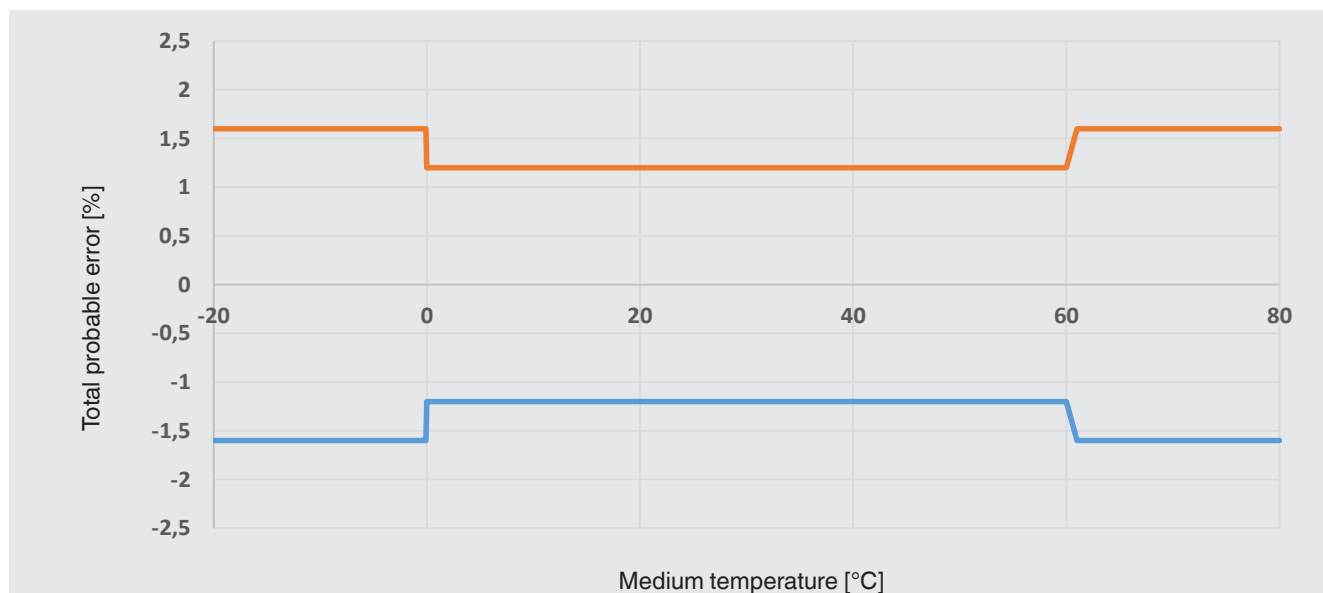
Accuracy specifications

Non-linearity per BFSL per IEC 62828-1	≤ ±0.25 % of span
Accuracy	→ See "Maximum measured error per IEC 62828-1"
Maximum measured error per IEC 62828-1	≤ ±0.5 % of span
Zero point setting	±3 % of span
Signal noise	≤ 0.2 % of span
Non-repeatability per IEC 62828-1	≤ 0.1 % of span
Total probable error per IEC 62828-2	→ See diagram „Total probable error per IEC 62828-2“
Long-term drift per IEC 62828-1	≤ ±0.2 % of span ≤ ±0.25 % for measuring range 0.4 bar
Reference conditions	Per IEC 62828-1

Accuracy specifications of the temperature value

Measuring range	-20 ... +80 °C [-4 ... +176 °F]		
Accuracy	→ See "Max. measuring deviation"		
Max. measuring deviation	For measuring range -20 ... +60 °C [-4 ... +140 °F]	±3.5 K	
	For measuring range 60 ... 80 °C [140 ... 176 °F]	±4.75 K	

Total probable error per IEC 62828-2



→ Higher accuracy in the range below 0 °C [32 °F] and over 60 °C [140 °F] possible upon request.

Measuring ranges, gauge pressure

bar	
0 ... 0.4	0 ... 40
0 ... 1	0 ... 60
0 ... 1.6	0 ... 100
0 ... 2.5	0 ... 160
0 ... 4	0 ... 250
0 ... 6	0 ... 400
0 ... 10	0 ... 600
0 ... 16	0 ... 1,000
0 ... 25	-

psi	
0 ... 1	0 ... 300
0 ... 5	0 ... 500
0 ... 15	0 ... 1,000
0 ... 25	0 ... 1,500
0 ... 30	0 ... 2,000
0 ... 50	0 ... 3,000
0 ... 100	0 ... 5,000
0 ... 160	0 ... 10,000
0 ... 200	0 ... 15,000

MPa	
0 ... 0.04	0 ... 4
0 ... 0.1	0 ... 6
0 ... 0.16	0 ... 10
0 ... 0.25	0 ... 16
0 ... 0.4	0 ... 25
0 ... 0.6	0 ... 40
0 ... 1	0 ... 60
0 ... 1.6	0 ... 100
0 ... 2.5	-

Measuring ranges, absolute pressure

bar abs.	
0 ... 0.4	0 ... 6
0 ... 1	0 ... 10
0 ... 1.6	0 ... 16
0 ... 2.5	0 ... 25
0 ... 4	-

psi abs.	
0 ... 5	0 ... 70
0 ... 10	0 ... 150
0 ... 15	0 ... 300
0 ... 30	-

MPa abs.	
0 ... 0.04	0 ... 0.6
0 ... 0.1	0 ... 1
0 ... 0.16	0 ... 1.6
0 ... 0.25	0 ... 2.5
0 ... 0.4	-

Vacuum and +/- measuring ranges

bar	
-1 ... 0	-1 ... +9
-1 ... +1	-1 ... +15
-0.2 ... +0.2	-1 ... +24

psi	
-14.5 ... 0	-14.5 ... +15
-14.5 ... +160	-14.5 ... +200
-14.5 ... +300	-

MPa	
-0.1 ... 0	-0.1 ... +0.1
-0.1 ... +0.9	-0.1 ... +1.5
-0.1 ... +2.4	-

Other measuring ranges on request.

Further details on: Measuring range	
Units	■ bar ■ psi ■ MPa
Maximum working pressure	→ Corresponds to the upper measuring range value / measuring range full scale value
Overpressure limit per IEC 62828-1	The overpressure limit is based on the measuring range. Depending on the selected process connection and the seal, restrictions in overpressure limit can result.
Measuring ranges < 10 bar	3 times
Measuring ranges ≥ 10 ... ≤ 600 bar	2 times
Measuring ranges > 600 bar	1.43 times
Vacuum resistance	Yes

Process connection				
Standard	Thread size	Max. measuring range	Overpressure limit	Seal
EN 837	G ¼ B	1,000 bar [15,000 psi]	1,430 bar [21,450 psi]	■ Copper ■ Stainless steel
	G ½ B			
	G ¼ B, female ¹⁾	1,000 bar [15,000 psi]	1,430 bar [21,450 psi]	-
DIN EN ISO 1179-2 (formerly DIN 3852-E)	G ¼ A	600 bar [8,700 psi]	858 bar [12,440 psi]	■ NBR ■ FPM/FKM
	G ½ A	400 bar [5,800 psi]	572 bar [8,294 psi]	■ NBR ■ FPM/FKM
ANSI/ASME B1.20.1	¼ NPT ¹⁾	1,000 bar [15,000 psi]	1,480 bar [21,400 psi]	-
	½ NPT ¹⁾			
ISO 7	R ¼ ¹⁾	1,000 bar [15,000 psi]	1,480 bar [21,400 psi]	-
KS	PT ¼ ¹⁾	1,000 bar [15,000 psi]	1,480 bar [21,400 psi]	-
SAE J514	7/16-20 UNF O-ring BOSS	600 bar [8,700 psi]	858 bar [12,440 psi]	■ FKM ■ NBR

1) Suitable for oxygen, oil- and grease-free

Details must be tested separately in the respective application. The specified values for the overpressure limit serve only as a rough orientation. The values depend on the temperature, the sealing used, the selected torque, the type and the material of the mating thread and the prevailing operating conditions.

Further details on: Process connection	
Max. measuring range	→ See table "Process connection" on page 4
Overpressure limit	→ See table "Process connection" on page 4
Seal	→ See table "Process connection" on page 4
Pressure port diameter	3.5 mm [0.14 in]
	→ Restrictor on request

Other process connections, seals and pressure port diameters on request.

Radio standard	
LoRaWAN®	
Specification	LoRaWAN® 868 MHz EU
Version	1.0.3
Functions	■ Registration ■ Configuration ■ Sending measured values ■ Alarm management ■ Battery status
Frequency range	863 ... 870 MHz
Range in free field	Typically 10 km [6 mi] → Depending on the ambient conditions, such as topography and building structures.
Antenna	PCB antenna, internal
Channel spacing	200 kHz
Bandwidth	125 kHz
Max. transmission power	14 dBm
mioty®	
Specification	Regional Profile EU1
Functions	■ Registration ■ Sending measured values ■ Alarm management ■ Battery status
Frequency range	863 ... 870 MHz
Range in free field	Typically 10 km [6 mi] → Depending on the ambient conditions, such as topography and building structures.
Antenna	PCB antenna, internal
Bandwidth	60 kHz
Max. transmission power	14 dBm
Bluetooth®	
Version	Bluetooth® 5.0 or newer
	→ Compatible with all Bluetooth® Low Energy versions 4.2 or newer
Functions	■ Registration ■ Configuration ■ Sending measured values ■ Alarm management ■ Battery status
Frequency range	2,402 ... 2,480 MHz
Range in free field	Typically 20 m [65 ft] → Depending on the ambient conditions, such as topography and building structures.
Antenna	Chip antenna, internal
Max. transmission power	4 dBm

→ For further information on the radio protocols, see www.wika.com.

Voltage supply and performance data		
Model PEW-1000 (Lxx) and PEW-1000 (Mxx)		
Battery pack	Lithium thionyl chloride battery and hybrid layer capacitor (model Tadiran HLC1020L) as an assembly with connection cable assembled.	
	Model Tadiran SL860/S	
Battery voltage	DC 3.6 V	
Battery life	> 10 years (measurement and transmission interval 1 hour, spreading factor 10)	
	→ At reference conditions	
Current supply	Max. 50 mA	
Transmission interval	Standard	30 minutes
	Minimum	1 minute (maximum transmission rate limited per ETSI EN300 220) → Limitation of the transmission interval per ETSI EN300 220 possible. The maximum transmission frequency and duty cycle comply with the standard ETSI EN300 220.
	Maximum	7 days
Measurement interval	Standard	1 minute
	Minimum	10 seconds → Smaller measurement intervals on request
	Maximum	7 days
Security	Full end-to-end encryption per AES-128	
Model PEW-1000 (Bxx)		
Battery pack	Lithium thionyl chloride battery and hybrid layer capacitor (model Tadiran HLC1020L) as an assembly with connection cable assembled.	
	■ Model Tadiran SL861/S ■ Model Tadiran SL860/S	
Battery voltage	DC 3.6 V	
Battery life		
Model Tadiran SL861/S	5 years (measurement interval 60 seconds)	
Model Tadiran SL860/S	7 years (measurement interval 60 seconds)	
	→ At reference conditions	
Current supply	Max. 20 mA	
Transmission interval	1.25 seconds → Update of the measured value only occurs in the set measurement interval	
Measurement interval	Standard	1 minute
	Minimum	10 seconds → Smaller measurement intervals on request
		Maximum

Material		
Material (wetted)	Stainless steel 316L	
Material (in contact with the environment)	Stainless steel 316L PBT (case)	
Pressure transmission medium		
Gauge pressure measuring ranges	< 10 bar / 100 psi / 1 MPa	Synthetic oil
	≥ 10 bar / 100 psi / 1 MPa	Dry measuring cell
Measuring ranges, absolute pressure	≤ 25 bar / 300 psi / 2.5 MPa	Synthetic oil
Vacuum and +/- measuring ranges	< 9 bar / 160 psi / 0.9 MPa	Synthetic oil
	≥ 9 bar / 160 psi / 0.9 MPa	Dry measuring cell

Operating conditions	
Medium temperature limit	-20 ... +80 °C [-4 ... +176 °F]
Ambient temperature limit	-20 ... +80 °C [-4 ... +176 °F]
Storage temperature limit	-40 ... +70 °C [-40 ... +158 °F]
Relative humidity, condensation per EN 61010-1	0 ... 95 % r. h.
Permissible pollution degree per EN 61010-1	2
Vibration resistance per IEC 60068-2-6	a = 1 g (7 ... 18 Hz)
	A = 0.8 mm (18 ... 50 Hz)
	a = 5 g (50 ... 200 Hz)
	→ Due to the built-in Li battery, the values comply with the requirements of UN 38.3.
Shock resistance per IEC 60068-2-27	50 g, 6 ms
Free fall per IEC 60068-2-31	
Individual packaging	1.2 m [3.94 ft]
Multiple packaging	0.5 m [1.6 ft]
Ingress protection (IP code) per IEC 60529	IP54, IP67 and IP65

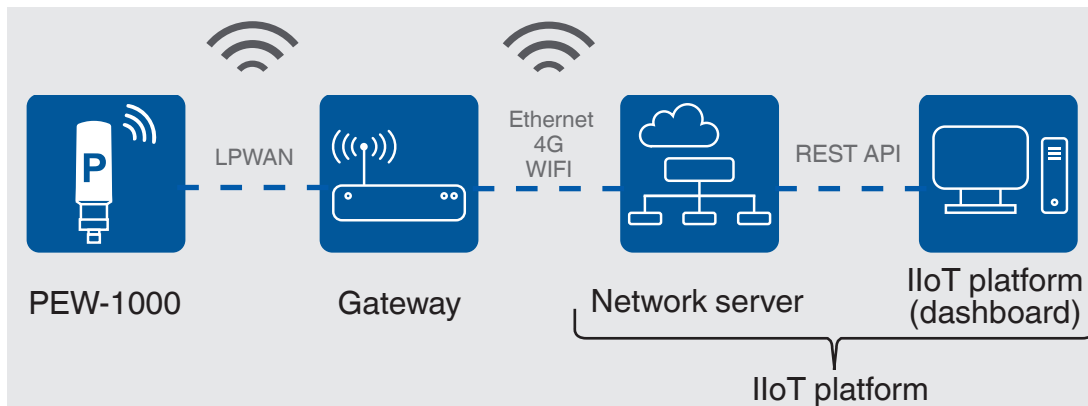
Alarms	
Alarms	Various alarms can be set. → See operating instructions for pressure sensor with wireless transmission, model PEW-1000 (article number 14471927).

Options for specific media	
Oil- and grease-free	
Residual hydrocarbon	< 1,000 mg/m ²

Packaging and instrument labelling	
Packaging	■ Individual packaging ■ Multiple packaging (up to 25 pieces possible)
Instrument labelling	■ WIKA product label, lasered ■ Customer-specific product label on request

LPWAN infrastructure

A measuring instrument that allows remote transmission via radio must be integrated into the IIoT infrastructure. The following schematic illustration shows a typical LPWAN infrastructure:



Data from an IIoT-capable measuring instrument is transmitted wirelessly via radio to the gateway. It is ensured that only authorised end devices may communicate with the network server (e.g. LoRaWAN®). For this, the measuring instrument must first be coupled with the network server. In LPWAN the wireless transmission is typically 10 km [6 mi]. The range is dependent on the topography, placement of the gateway and further environmental influences.

Measured values from several hundred LPWAN-enabled IIoT devices can be collected by a gateway and transmitted to the network server via cable (e.g. Ethernet) or over-the-air (e.g. 4G or WLAN).

In a web-based IIoT platform, the measured data can be stored, alarms can be set and configurations can be made on the instrument. If the limit values are exceeded, alarm messages can be sent as notification via e-mail. The measured data can be analysed via the visualisation in the dashboard, thus enabling remote monitoring of the process pressure. WIKA provides the “myWIKI wireless device” app to support commissioning and local status inquiries of the measuring instrument.

“myWIKI wireless device” app

Via the “myWIKI wireless device” app, the measuring instrument can be configured.

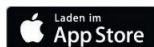
Furthermore, the instrument data and the current measured values can be read.

The app functions are used via Bluetooth® and a Bluetooth®-capable end device.



Functions of the app:

- Indication of the instrument information
- Indication of the instrument status
- Readout of the current measured values
- Manual join request for the LoRaWAN® network
- Configuration such as measuring and transmission rate, alarm values, etc.



For iOS-based end devices, the app is available in the Apple Store via the link below.

[Download here:](#)



For Android-based end devices, the app is available in the Play Store via the link below.

[Download here:](#)



Approvals

Approvals included in the scope of delivery

Logo	Description	Country
CE	EU declaration of conformity	European Union
	Radio Equipment Directive	
	EN 61326 emission (group 1, class B) and immunity (industrial application)	
	This wireless device may be used without restriction in the member states of the EU and in the countries of the EFTA. Use in other countries is not permitted.	
	RoHS directive	

Manufacturer's information and certificates

Logo	Description
-	China RoHS directive

Test report

Test report	
Non-linearity 0.25 %	3 measuring points

Certificates (option)

Certificates	
Certificates	■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy) ■ 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metal parts, indication accuracy, calibration certificate)

→ For approvals and certificates, see website

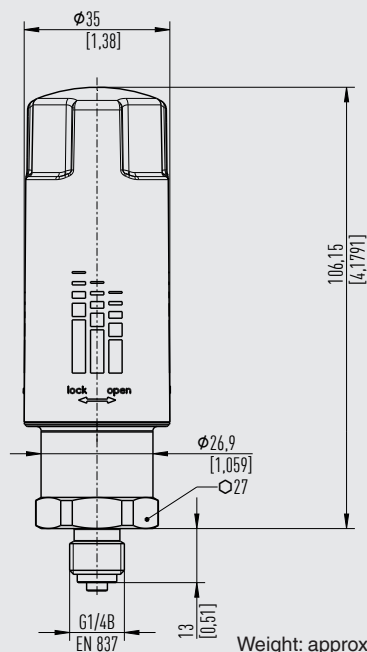
Patents, property rights

Patent number	Description
US 18/124,105 EP 21754717.3 PCT/EP 2021/070349 CN 202180062722.8 JP 2023-514962 BR 112023003251-2 KR 10-2023-7013079	Pending property rights in various countries as listed on the left.

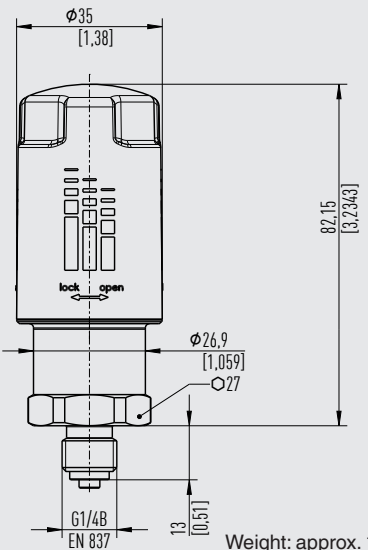
Dimensions in mm [in]

With battery pack model Tadiran SL860/S

With battery pack model Tadiran SL861/S

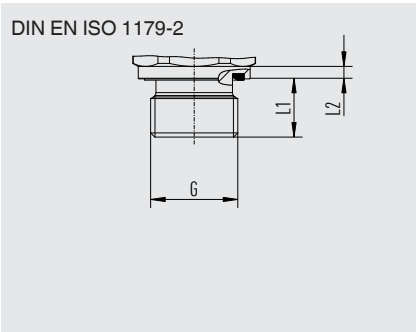


Weight: approx. 125 g [2.28 lb]

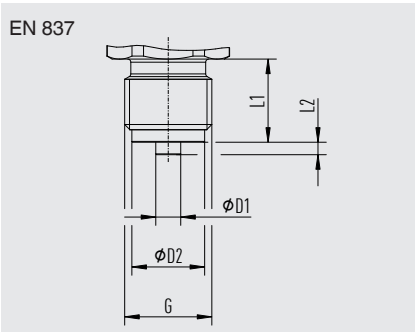


Weight: approx. 112 g [2.25 lb]

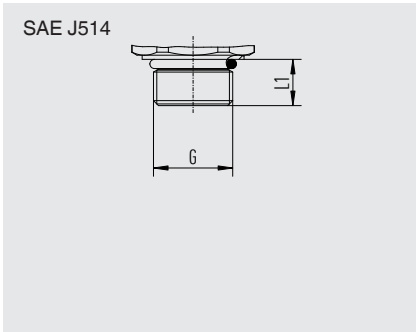
Process connections



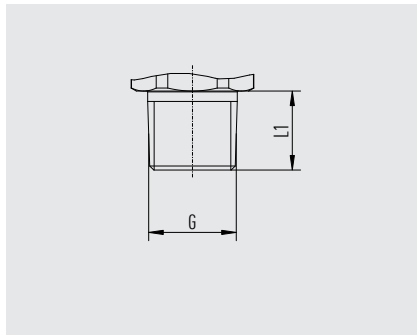
G	L1	L2
G ¼ A	12 [0.31]	2 [0.08]
G ½ A	14 [0.55]	3 [0.12]



G	L1	L2	D1	D2
G ¼ B	13 [0.51]	2 [0.08]	5 [0.19]	9.5 [0.374]
G ½ B	16 [0.63]	3 [0.12]	6 [0.24]	20 [0.79]

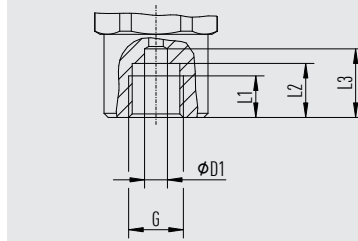


G	L1
7/16-20 UNF BOSS	11.13 [0.4382]



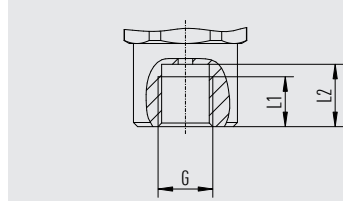
G	L1
¼ NPT ANSI/ASME B1.20.1	13 [0.51]
½ NPT ANSI/ASME B1.20.1	19 [0.75]
R ¼ ISO 7	13 [0.51]
PT ¼ KS	13 [0.51]

EN 837, female thread



G	L1	L2	L3	D1
G ¼	10 [0.39]	13 [0.51]	16.5 [0.65]	5.5 [0.217]

Female thread, compatible with bite-type fitting

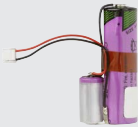


G	L1	D1
G ¼	14 [0.55]	17.5 [0.689]

Accessories

Model	Order number
LoRaWAN® gateway, preconfigured for WIKA network server	
Gateway for indoor use	On request
Gateway for outdoor use	On request

Spare parts

Model	Description	Order number
Seals for process connection		
G ¼ B EN 837	Copper	11250810
	Stainless steel	11250844
G ½ B EN 837	Copper	11250861
	Stainless steel	11251042
G ¼ A ISO 1179-2	NBR	1537857
	FPM (green)	1576534
G ½ A ISO 1179-2	NBR	1039067
	FPM (green)	1039075
7/16"-20 UNF SAE O-ring BOSS	-	11031905
Battery pack	Lithium thionyl chloride battery and hybrid layer capacitor (model Tadiran HLC1020L) as an assembly with connection cable assembled.	
	Typ Tadiran SL861/S	14395532
	Typ Tadiran SL860/S	14392747

Ordering information

Model / Radio standard / Region of use / Non-linearity / Measuring range / Process connection / Seal / Connection to platform / Auxiliary power / Certificates / Packaging

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The specifications given in this document represent the state of engineering at the time of publishing.

We reserve the right to make modifications to the specifications and materials.

In case of a different interpretation of the translated and the English data sheet, the English wording shall prevail.



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