

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

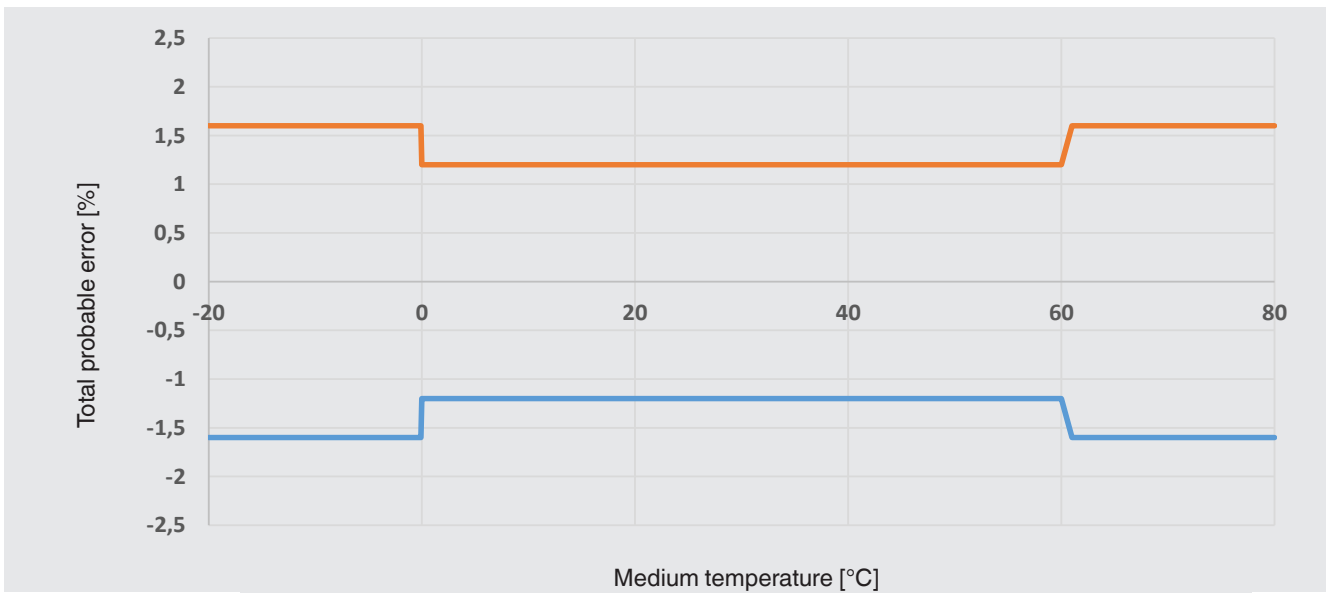
The sensor enables simple condition monitoring. A temperature indication, in addition to the pressure value, reveals possible malfunctions due to wear or system faults at an early stage and thus reduces the risk of downtime and damage.

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 | <ul style="list-style-type: none"> ■ 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] | <ul style="list-style-type: none"> ■ 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] | <ul style="list-style-type: none"> ■ NBR ■ FPM/FKM |
| | G ½ A | 400 bar [5,800 psi] | 572 bar [8,294 psi] | <ul style="list-style-type: none"> ■ 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] | <ul style="list-style-type: none"> ■ 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 | <ul style="list-style-type: none"> ■ 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 | <ul style="list-style-type: none"> ■ 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 | <ul style="list-style-type: none"> ■ 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. | |
| | <ul style="list-style-type: none"> ■ 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 |

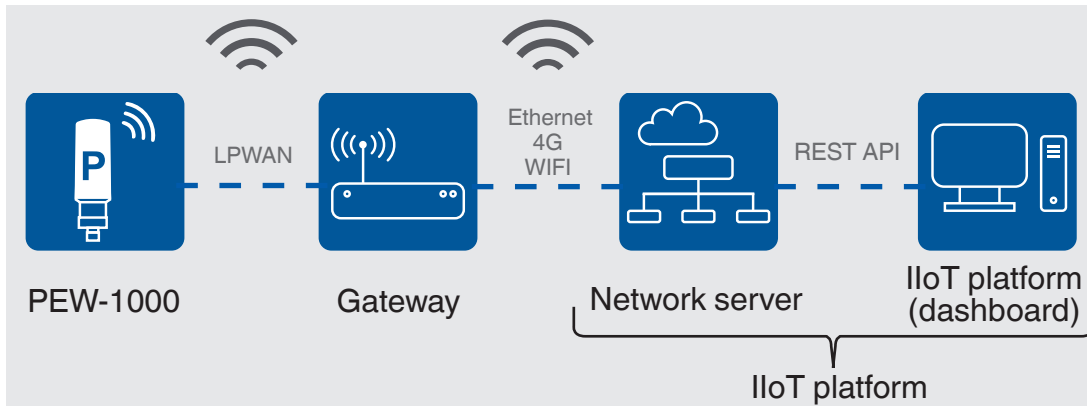
| Alarms | |
|--------|--|
| Alarms | Various alarms can be set. → See operating instructions for pressure sensor with wireless transmission, model PEW-1000 (article number 14471927). |

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

| Packaging and instrument labelling | |
|------------------------------------|---|
| Packaging | <ul style="list-style-type: none"> ■ Individual packaging ■ Multiple packaging (up to 25 pieces possible) |
| Instrument labelling | <ul style="list-style-type: none"> ■ 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 “myWIKa wireless device” app to support commissioning and local status inquiries of the measuring instrument.

“myWIKa wireless device” app

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

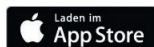
Furthermore, the instrument data and the current measured values can be read.

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 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 | European Union |

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 | <ul style="list-style-type: none"> ■ 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

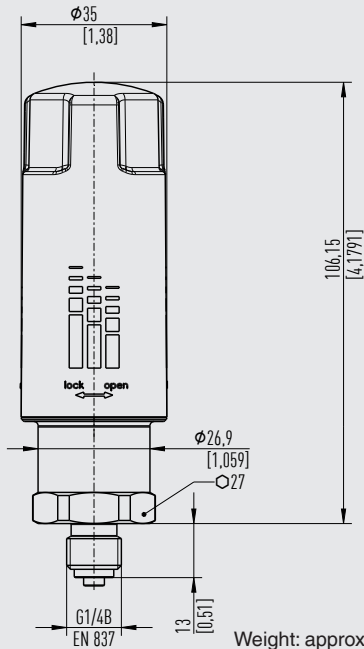
Patents, property rights

| 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. |

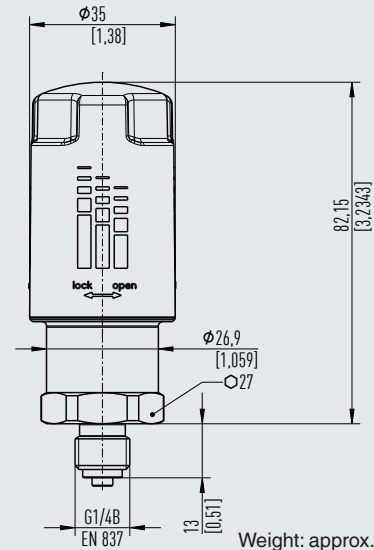
Dimensions in mm [in]

With battery pack model Tadiran SL860/S

With battery pack model Tadiran SL861/S



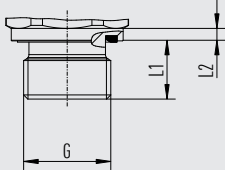
Weight: approx. 125 g [2.28 lb]



Weight: approx. 112 g [2.25 lb]

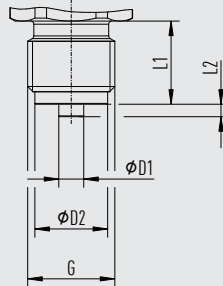
Process connections

DIN EN ISO 1179-2



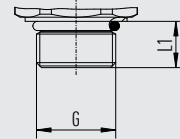
| G | L1 | L2 |
|-------|-----------|----------|
| G ¼ A | 12 [0.31] | 2 [0.08] |
| G ½ A | 14 [0.55] | 3 [0.12] |

EN 837

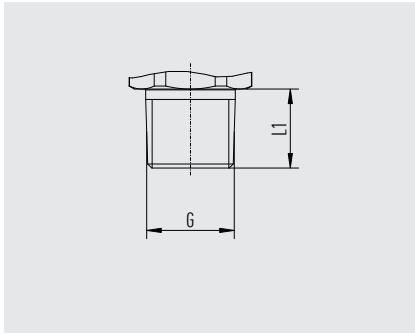


| G | L1 | L2 | D1 | D2 |
|-------|-----------|----------|----------|-------------|
| G ¼ B | 13 [0.51] | 2 [0.08] | 5 [0.19] | 9.5 [0.374] |
| G ½ B | 16 [0.63] | 3 [0.12] | 6 [0.24] | 20 [0.79] |

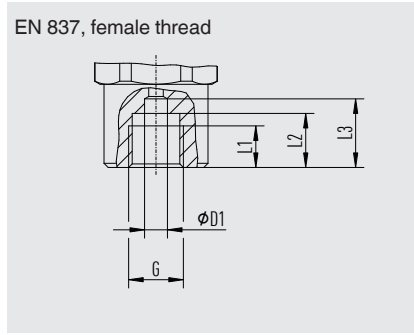
SAE J514



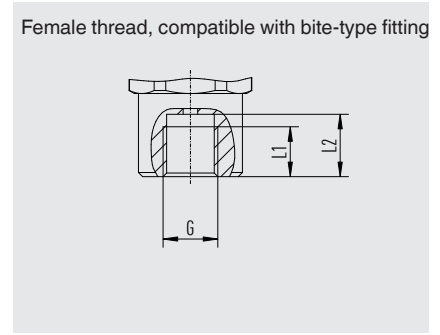
| G | L1 |
|------------------|----------------|
| 7/16-20 UNF BOSS | 11.13 [0.4382] |



| 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] |



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


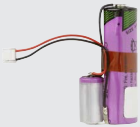


| G | L1 | D1 |
|-----|-----------|--------------|
| G ¼ | 14 [0.55] | 17.5 [0.689] |

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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LoRaWAN® is a trademark used under licence from LoRa-Alliance®.

mioty® is a registered trademark of the Fraunhofer IIS.

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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.

