Submersible liquid level sensor

Main characteristics

- Piezoresistive diffuse silicon pressure sensor
- Measurement carried out by submerging probe, easy to install
- Used to measure liquid levels
- Structural design offering multiple protection, high protection capability
- Models capable of measurements up to 2 m, 5 m, 10 m and 20 m*****
- Anti-corrosive stainless steel material suitable for a wide range of uses

***** *Model details are provided under the subheading 'available models'.*

Applications

- Static pressure levels
- Liquid storage tanks
- Sewage
- Industrial water
- Pools
- Wells
- Rivers
- Seawater
- Lakes

Overview

The product presented in this datasheet is a submersible level sensor for liquids.

The Liquid Level Sensor accurately measures the static pressure of liquids proportional to their depth. It takes measurements using a high performance piezoresistive diffuse silicon pressure sensor..

Recorded measurements are converted into a linear 4-20 mA current signal output according to the sensor's measurement range. This output is connected to the Electric Current IoT Extension (EM C104), which is used in conjunction with the LoRa Endpoint , ZigBee Endpoint (IEEE 802.15.4) or ITS (Mobile network).

The sensor is submersed directly into the liquid for which a measurement of depth level is needed. The Liquid Level Sensor can be used to take measurements in water tanks, cisterns, reservoirs, rivers, dams, water/sewage treatment plants, and other installations.

Available models

Model	Description
KWS-1002	Probe with a 2-meter cable.
KWS-1005	Probe with a 5-meter cable.
KWS-1010	Probe with a 10-meter cable.
KWS-1020	Probe with a 20-meter cable.

Technical specifications

Physical/Environmental

- Measurement range*: 0–2 m, 0–5 m, 0–10 m e 0–20 m
- Power source
  - Power supply: 12–36 V
  - Output: 4–20 mA
- Operating temperature: -20 °C to 85 °C
- Storage temperature: -40 °C to 125 °C
- Overpressure: 200% FS to 300% FS
- Mechanical vibration: 20 g (20–5000 Hz)
- Impact: 100 g (11 ms)
- Accuracy: 0.5% FS
- Insulation: 200 MΩ / 250 VDC
- Response time: ≤ 1 ms (up to 90%FS in analog circuit boards)
- Long-term stability: ±0.2% FS/ano
- Protection rating: IP68
- Material:
  - Stainless steel level probe
  - Cable with polyurethane wire

Weight and dimensions

- Gross weight:
  - 2 meter submersible cable: 500 g
  - 5 meter submersible cable: 650 g
  - 10 meter submersible cable: 1000 g
  - 20 meter submersible cable: 1550 g
- Net weight:
  - 2 meter submersible cable: 350 g
  - 5 meter submersible cable: 550 g
  - 10 meter submersible cable: 850 g
  - 20 meter submersible cable: 1450 g
- Transport packaging dimensions:
  - 2 meter and 5 meter cable: 280x240x50 mm
  - 10 meter cable: 280x240x70 mm
  - 20 meter cable: 210x180x100

Warranties and certification

- Total warranty (legal warranty + Khomp warranty): 1 year
  - Legal warranty: 90 days
  - Khomp Warranty: 9 months
- ISO 9001-certified manufacturer

***** *Model details are provided under the subheading "available models".*

Measure the liquid column (height)

The formulas for calculating the liquid column (height) for level sensor models are observed below:

KWS-1002 → Range 0–2 m (2 m cable): **Level = (0.125 * mA_current) - 0.5**
Examples:
(0,125 * 4 mA) - 0,5 = 0 m
(0,125 * 12 mA) - 0,5 = 1 m
(0,125 * 20 mA) - 0,5 = 2 m

KWS-1005 → Range 0–5 m (5 m cable): **Level = (0,3125 * mA_current) - 1,25**
Examples:
(0,3125 * 4 mA) - 1,25 = 0 m
(0,3125 * 12 mA) - 1,25 = 2,5 m
(0,3125 * 20 mA) - 1,25 = 5 m

KWS-1010 → Range 0–10 m (10 m cable): **Level = (0,625 * mA_current) - 2,5**
Examples:
(0,625 * 4 mA) - 2,5 = 0 m
(0,625 * 12 mA) - 2,5 = 5 m
(0,625 * 20 mA) - 2,5 = 10 m

KWS-1020 → Range 0–20 m (20 m cable): **Level = (1,25 * mA_current) - 5**
Examples:
(1,25 * 4 mA) - 5 = 0 m
(1,25 * 12 mA) - 5 = 10 m
(1,25 * 20 mA) - 5 = 20 m

Additional product image

Caption: *This image presents a Liquid Level Sensor connected to the modular EM C104 extension unit. The system is integrated into the LoRa Endpoint in order to provide the ITG gateway with wireless data transmission.*

Additional product image

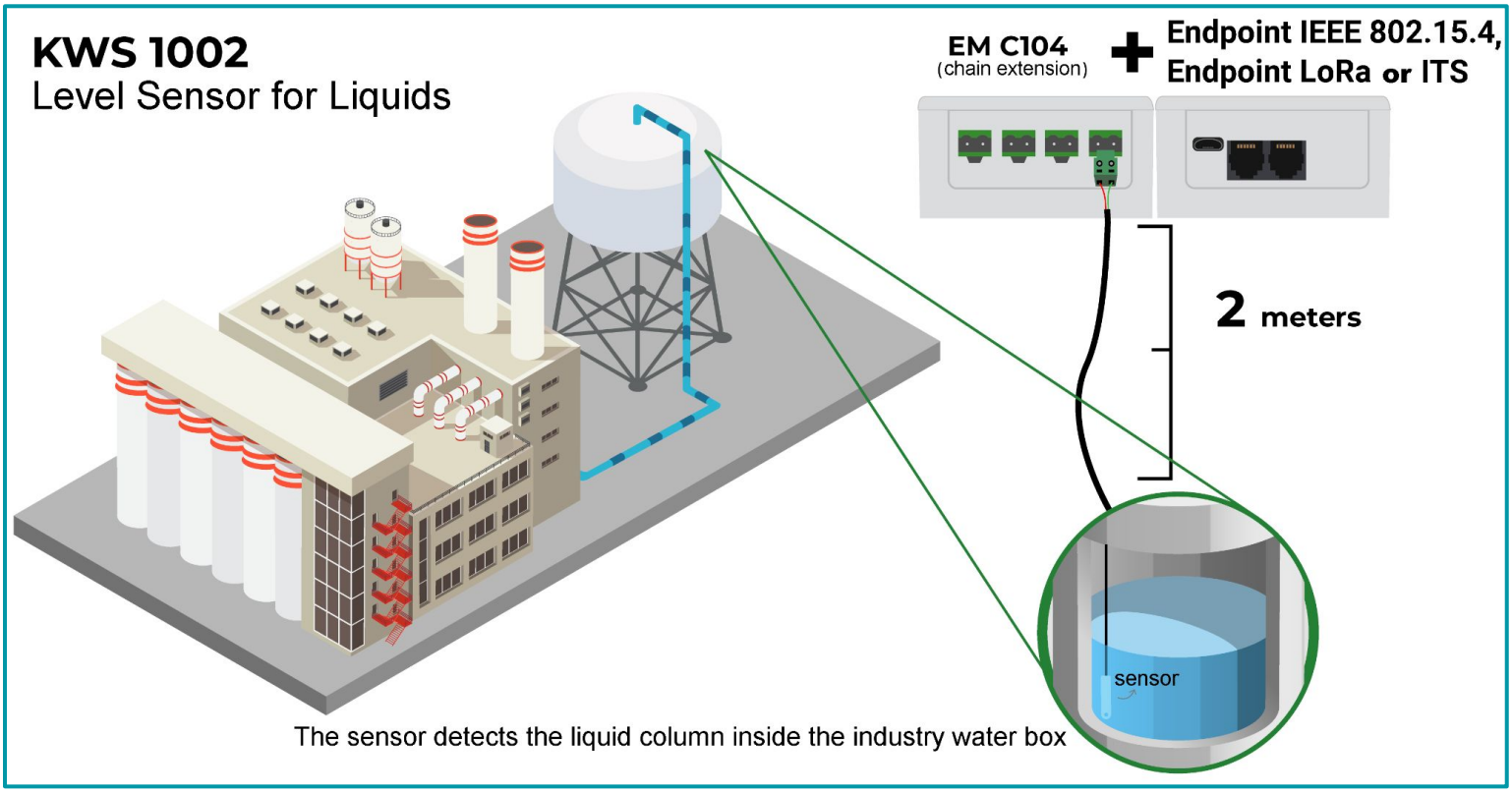
Caption: *This image presents a Liquid Level Sensor connected to the modular EM C104 extension unit. The system is integrated into the IEEE 802.15.4 Endpoint in order to provide the ITG gateway with wireless data transmission.*

Additional product image

Caption: *This image presents a Liquid Level Sensor connected to the modular EM C104 extension unit. The system is integrated into the ITS in order to provide the ITG gateway with wireless data transmission.*

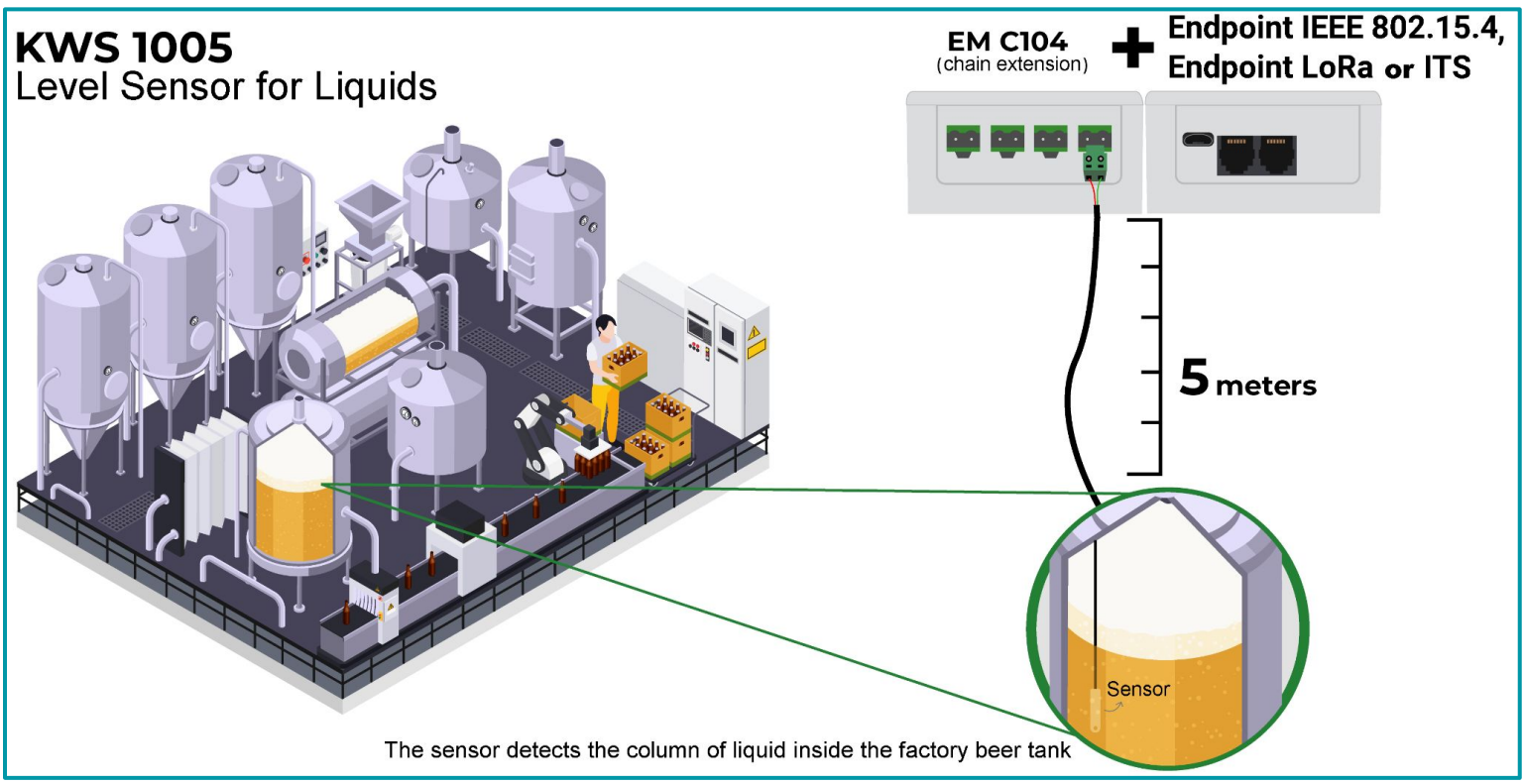
Suggested application

KWS 1002
Level Sensor for Liquids



The sensor detects the liquid column inside the industry water box

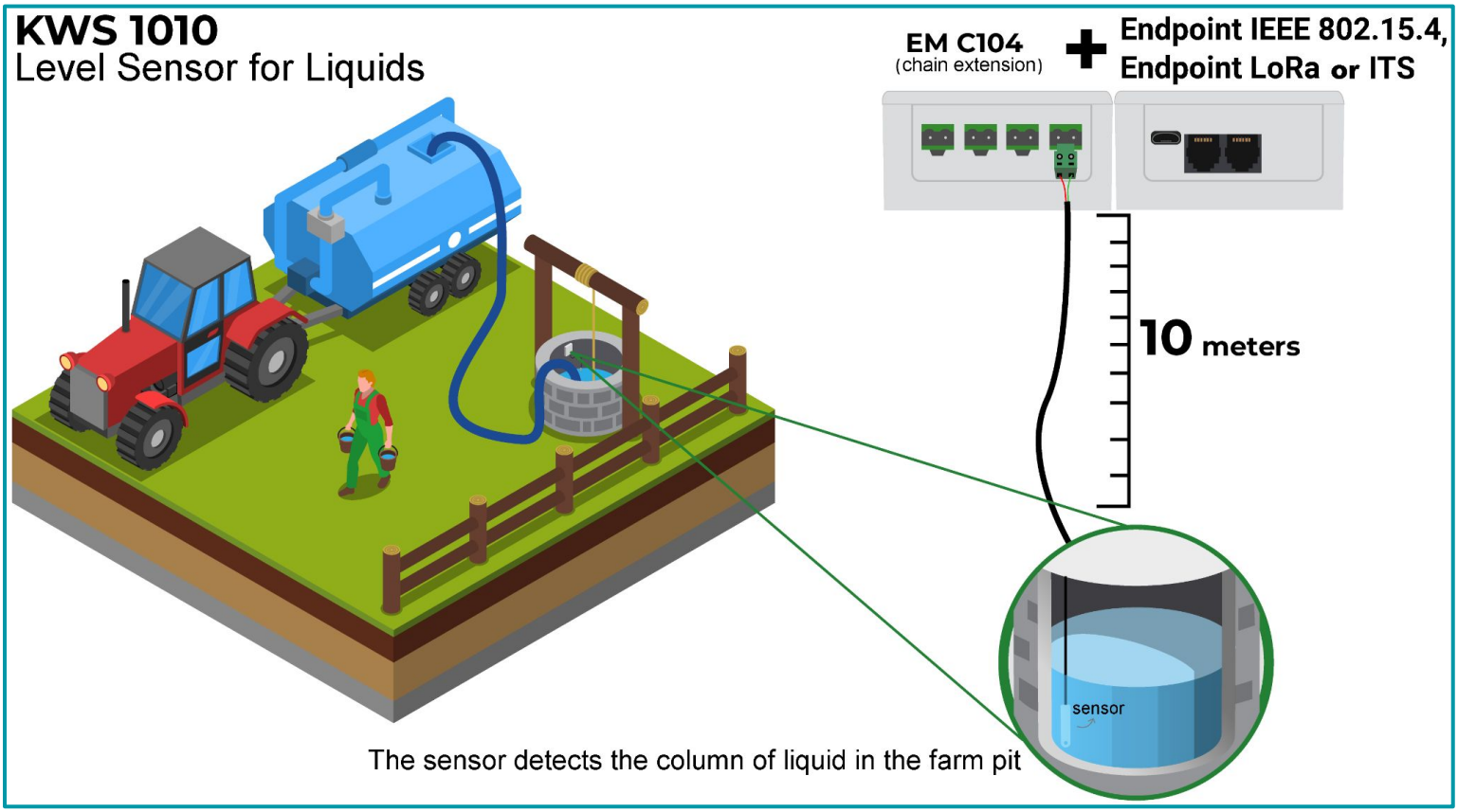
KWS 1005
Level Sensor for Liquids



The sensor detects the column of liquid inside the factory beer tank

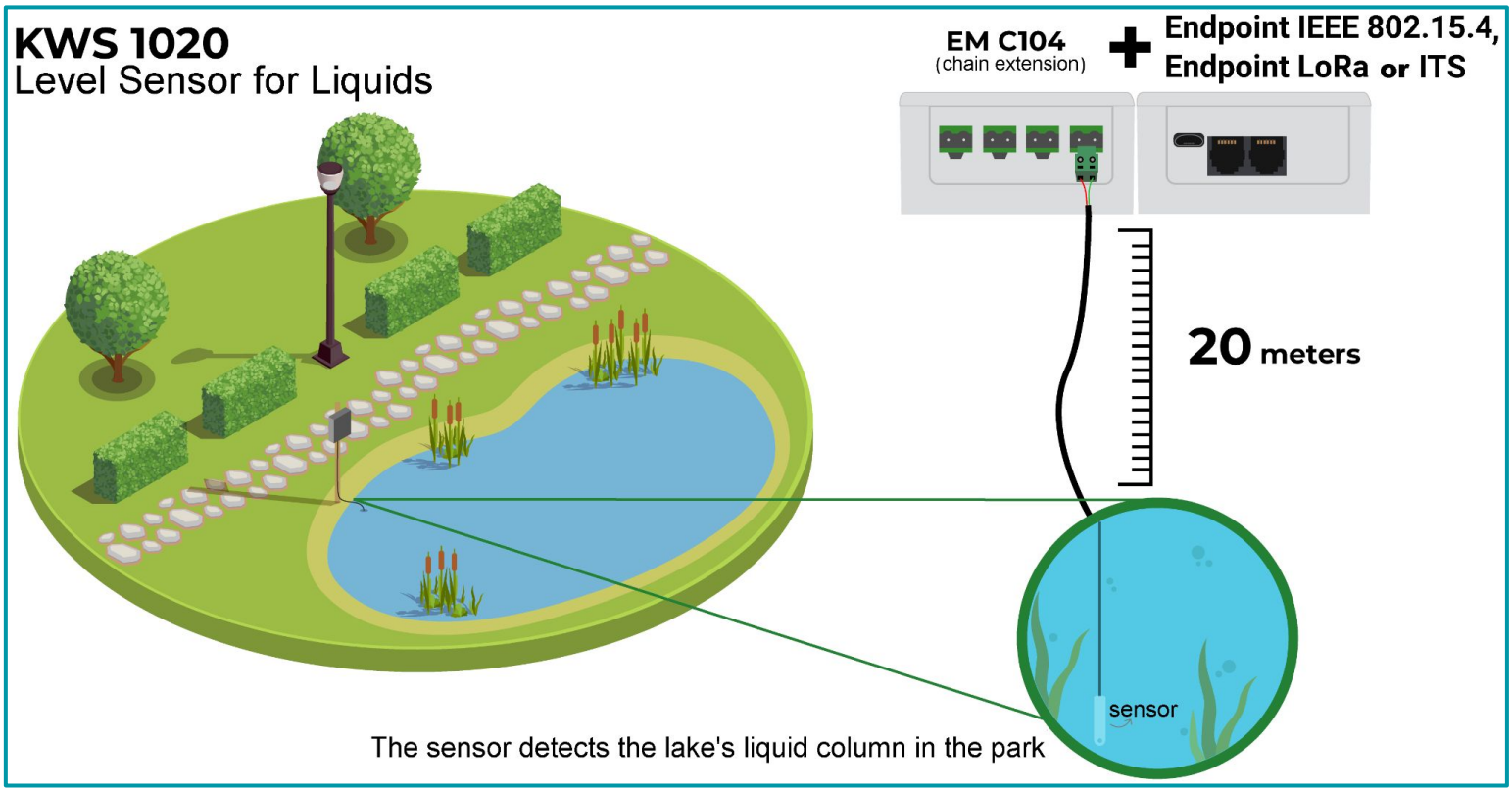
Suggested application

KWS 1010
Level Sensor for Liquids



The sensor detects the column of liquid in the farm pit

KWS 1020
Level Sensor for Liquids



The sensor detects the lake's liquid column in the park