

Aguardio

PIPE SENSOR MANUAL



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1. Overview

The connected Aguardio Pipe Sensor not only detects leaking toilets – but also provides valuable data that can be used to conduct detailed toilet leak analysis, improve facility management, and effectively address critical issues such as stagnant water and hygiene concerns, such as Legionella.

One of the most common causes of water waste in households is leakage – often from toilets and taps. Large quantities of water can flow down the inner backside of a toilet pan without being noticed and without being visible (275 litre/day most often cannot be heard or seen according to the Danish government, and too often users do not take action even when toilet leaks are clearly visible). The Aguardio Leak Sensor detects such water leaks by measurements, sensor data & algorithms, where the temperature difference between the water inlet pipe temperature and the ambient room temperature is a central factor.

The sensor is made from reusable plastic and is equipped with a side button and a thermal gap filler pad underneath. Next to the grey thermal gap filler pad is a sticker with the serial number of each individual sensor, presented as a number as well as a scannable QR code, along with the product ID and Part Number (P/N) code. (Please see Figure 1).



Figure 1 Aguardio Pipe Sensor

Manufacturer : Xtel Wireless ApS

Model: H2O Leak Sensor

Part Number: XT0184, 80018400

Hardware Version: 1.5B

The sensor's battery life is approximately ten years and uses non-replaceable, non-rechargeable CR123A-type batteries.

The sensor's dimensions: Length – 6.5 cm (2,5 in), Width – 2.1 cm (0.82 in), Height – 3 cm (1.81 in).

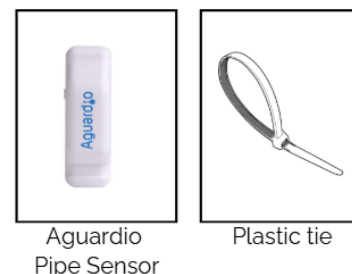
Net weight: 25g (0.88 oz)

2. Operational Overview

2.1 Activation & Placement

1. Contents of the product package

Each individual package contains a Pipe Sensor and a plastic tie. For large quantity packages, Pipe Sensors may be individually wrapped in plastic bags and accompanied by separately packed plastic ties.



2. Activation of the Pipe Sensor

Activate the Pipe Sensor by pressing and holding the button on the side of the sensor for ten seconds. before placing it on the pipework. This step will enable immediate collection of data.



3. Placement of the Pipe Sensor

Applications: Incoming hot or cold pipework, such as water taps, toilet water inlet pipes, water supply pipes, or flexible braided hoses.

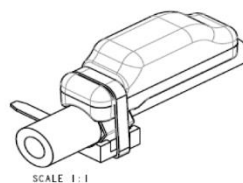
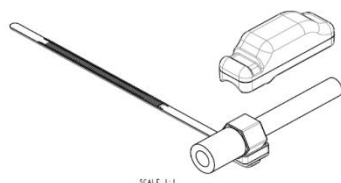
Recommended fitting: Heat-conductive materials, such as metal (e.g., copper or steel pipework), are recommended. Plastic pipework may also work in some cases. Customers are encouraged to test the sensor on their specific pipe types to evaluate its precision and suitability for their intended purposes.

Pipe adaptability: Pipes ranging from 8 to 28 mm (0.3 to 1.1 in)

Make sure that the sensor's grey thermal sponge is fitted against the pipe, or metal surface.

4. Secure the plastic tie

- Wrap the plastic tie loosely around the pipe, allowing enough room to position the sensor inside the loop
- Gradually tighten the plastic tie to firmly affix the sensor to the pipework.



2.2 Data & data transmission

Once the sensor is activated, it begins collecting data, which can later be transmitted to the cloud via Bluetooth through a Gateway or the Aguardio App.

The sensor records water and ambient temperatures, as well as estimates of the total number of flushes or water activities, on an hourly basis. If the water flow in the pipe lasts longer than a minute, additional temperature readings will be taken every minute.

When collecting data with app: The sensor can collect up to 10-14 days worth of data. When the storage reaches maximum capacity, new data cannot be collected and the sensor suspends further data logging until the storage is cleared.

When collecting data with Gateway: Data is automatically collected twice a day (The frequency of the data collection can be adjusted).

The sensor has integrated Bluetooth LE 5.1 technology.

Antenna Gain (dBi) : 1.18

2.3 Functionalities

Flush & Leak Detection

In a normal setting, the water inside the water inlet pipe will be close to ambient room temperature. When the toilet flushes, the automatic mechanism that fills up the tank with e.g. 4-5 litres of water will take about 1-5 minutes. This normally changes the temperature of the water supply pipe/toilet inlet pipe. The sensor then detects a break that occurs on the temperature curve. When the toilet's water tank is full again, the water inlet pipe temperature will change (increase/decrease) gradually until it reaches room temperature again. Based on this reading, the Leak Sensor will record a potential toilet flush. If the temperature in the water inlet pipe differs from ambient temperature over 24 hours, the Leak Sensor will record a potential leak. For sensors where data is collected and transferred to the Aguardio data HUB then more detailed analysis can give very detailed insights into patterns of water activity and leak patterns (like "on/off" leaks).

Risk of Legionella monitoring

The Aguardio Pipe Sensor can be placed on hot or cold taps to record temperature readings precisely. It detects temperature stamps 60 seconds after a detected water flow in a pipe and keeps making temperature measurements every minute until the water is turned off.

These temperature readings are then sent to Aguardio's online platform, Aguardio Hub, where Managers/responsible Personnel can search for specific locations within a building to check the highest/lowest water temperatures reached.

2.4 Additional guidance

The thermal gap filler pad

The electronic sensor is fitted underneath the sponge conductor, please ensure this is not dislodged or damaged during installation. If the pad is loose before installation, gently reposition it back into place. Replacement pads can be purchased. In situations where the thermal gap filler cannot touch the pipe (e.g. because of pipe dimensions) it can be considered to use an extra gap filler pad to create contact to the pipe, but optimal function cannot be guaranteed (tip: Testing this by analysing obtained data can help to evaluate if it works at a satisfactory level).

The function of the side button

The button has two functions: It activates new sensors and resets the toilet flush count.

1) The Leak Sensor is in sleep mode when the product is delivered. To permanently activate the Leak Sensor, press and hold the button for five seconds. The product will remain activated for the rest of its lifetime.

2) Press and hold the side button for 15 sec, to reset the toilet flush count.

3. Specifications

Specifications	Description
Location	Indoors
IP - rating	IP54
Water resistance	Exposure to high humidity and wet conditions or the like risks shortening the product lifetime and/or accelerating battery drain. To prevent water ingress, ensure the sensor is positioned with its underside hole protected from potential exposure to moisture.
Operating environment temperature range	0 to 40 °C (32 to 104°F)
Certification labels and other markings	

4. FCC Statement

This equipment has been tested and found to comply with the limits In accordance with FCC 47 CFR Part 15B

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

5. CE Compliance Statement

Hereby, [Aguardio ApS] declares that the radio equipment type [G3 Shower Sensor] is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:

<https://aguardio.com/>