DENODL®
TECH FOR EASIER LIFE

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HYDROBALL® TWIN

HB01N-EU (NB-IoT) / HB01L-EU (LoRaWAN)

PRODUCT DESCRIPTION

HYDROBALL®TWIN is the new **DENODL®**, sensor, design to meet the need of the professional agriculture and gardening sectors, allowing measurements up to 2 metres deep, enough to reach most tree, fruit and ornamental plant roots. Typical applications include orchards, cereal crops, citrus plantations, and urban parks and garden. Additionally, it can be installed in sludge piles and composting, withstanding chemical attacks and high temperatures.

HYDROBALL®TWIN offers an unprecedented view of the soil in relation to the investment required. All **DENODL®** sensors share a product design approach based on robustness, simplicity, autonomy, and versatility.

HYDROBALL®TWIN specializes in measuring soil water parameters, being the first sensor capable of combining volumetric water content (VWC), water potential, electrical conductivity (salinity) and soil temperature into a single measuring device. This combination allows for accurate diagnosis of the water status and characteristics of the soil (soil texture and hydraulic curves), facilitating the application of precision agriculture techniques aiming at optimizing input use and improving both the quality and productivity of the plant or crop.

HYDROBALL®TWIN consists of two modules connected by a cable. The lower module or 'probe' is buried at the plant root level, up to a depth of 2 meters, and is capable of autonomously managing the measurement and wireless transmission of metrics. The upper module or 'head' is located near the surface and uses the most appropriate IoT communication standards to maximize energy savings and extend battery life. Being positioned near the surface makes it easier to access the batteries, allowing for their replacement without the need to uninstall the probe.

HYDROBALL®TWIN includes a free subscription to the **DENODL®App**, cloud-based platform, which allows you to easily create a digital twin of the installation, consult data, generate alerts, and access many other functionalities. It is also possible to integrate it with third-party platforms through the **DENODL®App** APIs.

TECHNICAL FEATURES

MAIN FEATURES

UPPER MODULE OR "HEAD"	
Dimensions	85 x 85 x 80 mm (width x length x height).
Weight	450g without batteries, 526g with batteries.
Finish	Matt black.
Materials	Polyesters and polyamides reinforced with fiber. PBT/PET + fiber, POM, TPE, PC, polyurethane resin.
LOWER MODULE OR "PROBE"	
Dimensions	85 x 85 x 73 mm (width x length x height).
Weight	450g.
Finish	Matt black.
Materials	Polyesters and polyamide reinforced with fiber. Ceramic. PBT/PET + fiber, POM, TPE, PC, polyurethane resin.

ELECTRONICS

Power supply	User-replaceable 4xAA alkaline batteries.
Battery life	2 years with NB-IoT model. 3 years with LoRaWAN model. *These estimates are based on the standard configuration of one measurement every 15 minutes and minimum adaptive mode. The duration depends on the measurement frequency, adaptive mode, and coverage at the installation point*
Input voltaje	6v.
Power consumption	400mA during the measurement and emission cycle. 5µA in standby mode.
Storage temperature	-20°C to 50°C.
Operating temperature	-10°C to 50°C. *The batteries used must withstand the operating temperature.*
Maximum operating altitude	2.000 metres.

COMMUNICATIONS

Pairing and configuration	Bluetooth 5.3/BLE.
NB-IoT	Model HB01N. *The device communicates directly to the internet via the cellular network.*
LoRaWAN	Model HB01L. *The device requires an intermediary element to access the cellular network. This element is known as a gateway. **DENODL®** offers the Hydropole solution as an autonomous gateway for LoRaWAN installations.*

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