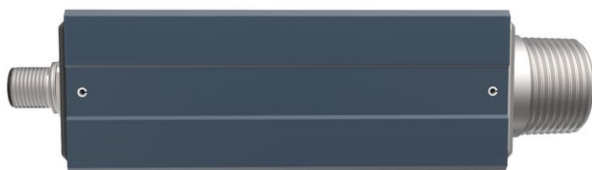


GRIDSCAN5000 hydrogen sensor

25 to 5,000 ppm · no calibration, no consumables



Catches the incipient fault before it becomes a failure

GRIDSCAN 5000

Dissolved hydrogen in transformer oil, measured continuously

amperis

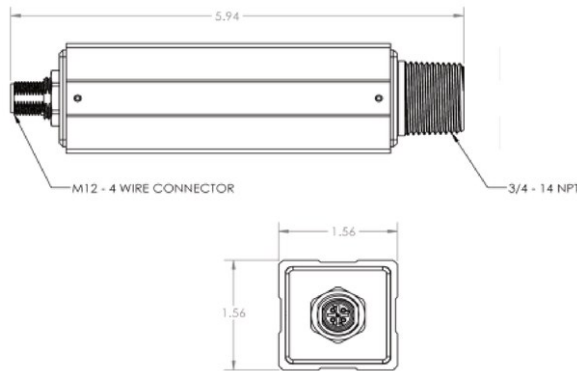
www.amperis.com

 C/ María Barbeito, 14
27003, Lugo, Spain

 **Contact**

T [+34] 982 20 99 20
info@amperis.com | www.amperis.com

Product description



Dimensions: 151 × 39.6 × 39.6 mm (5.94 × 1.56 × 1.56 in). 3/4"-14 NPT thread and 4-wire M12 connector.

The GRIDSCAN 5000 continuously measures the hydrogen dissolved in transformer oil, the first gas to appear when an internal fault begins. It screws directly onto a tank valve, has no moving parts and runs unattended for its whole service life.

Solid-state sensor, no consumables

The sensing element is solid state: no membranes, no calibration gases, no pumps and no chromatography columns. There is nothing to replace or check between transformer inspections.

Patented self-calibration

The sensor calibrates itself and corrects drift, so the reading stays valid without periodic calibration or removal. Three-year warranty on the unit and ten-year warranty on the hydrogen sensing element.

Built for outdoor service

- IP68 ingress protection: 7.62 m of water for 14 days.
- C5M corrosion class, equivalent to a marine environment with salt-water condensation.
- Ambient temperature from -40 to 70 °C; oil from -40 to 105 °C.
- Vibration tested and rated for 30 g shock to IEC 60068.

Commissioned in hours

It is installed with a wrench and a four-wire cable. Once powered, the unit runs its self-test and start-up sequence and begins delivering valid readings the same day.



C/ María Barbeito, 14
27003, Lugo, Spain

Contact

+T [+34] 982 20 99 20
info@amperis.com | www.amperis.com

Installation and applications



Permanent monitoring of the transformer fleet, with no site visits to draw oil samples.

Where it goes

- Power and distribution transformers, new or in service.
- Wind and solar farm transformers, with high harmonic content.
- Network transformers in underground vaults.
- Offshore platforms and substations in salt-laden air.
- Railway traction and industrial transformers.

Mounting

The oil-calibrated version mounts horizontally with the air-bleed assembly; the gas-calibrated version accepts horizontal or vertical mounting in the head space. Both need a 3/4" ball or gate valve ($\geq$ DN20) and thread sealant; galvanised fittings must not be used.

Wiring

A single shielded four-conductor 18 AWG cable, with a female M12 connector and IP67/IP68 rating, carries power and communications between sensor and control cabinet over typical runs of 5 to 30 m. From the cabinet, the RS-485 bus reaches up to 1,000 m.

What it changes

It replaces periodic gas analysis with permanent surveillance: hydrogen is seen rising the moment it appears, leaving time to schedule the intervention instead of suffering the outage.



C/ María Barbeito, 14
27003, Lugo, Spain



+T [+34] 982 20 99 20
info@amperis.com | www.amperis.com

Communications and software

Straight into SCADA

The sensor speaks Modbus RTU or DNP3 over two-wire half-duplex RS-485 and fits both stand-alone installations and third-party multi-gas monitors. Factory settings: Modbus address 1, DNP3 source address 4 and destination address 3, 19,200 baud, 8 data bits, no parity. With the matching analogue output module it also provides a 4-20 mA signal for legacy equipment.

Configuration software

The Windows configuration utility connects to the sensor over RS-485 or through an Ethernet-to-RS485 bridge and gathers everything commissioning needs into four tabs:

- Real-time data: hydrogen in ppm, moisture and sensor status, with live capture to a CSV file.
- Configuration: protocol and address, baud rate, clock synchronisation and owner, substation and transformer identification.
- Insulating liquid type: mineral, silicone, natural ester or synthetic ester, the latter with its own Ostwald slope and offset.
- Read and write of the complete configuration file, to replicate settings across the fleet or restore them after a replacement.
- Demo mode, to prepare the installation with no unit connected.

Onboard logging

The sensor itself keeps one year of history, so a communications outage leaves no gap in the data.



C/ María Barbeito, 14
27003, Lugo, Spain

✉ Contact

+T [+34] 982 20 99 20
info@amperis.com | www.amperis.com

MODEL RANGE

Every version measures from 25 to 5,000 ppm and is available oil-calibrated or gas-calibrated.

GRIDSCAN 5000	Accuracy of ± 20 % of reading or ± 25 ppm, whichever is greater. The reference version for fleet-wide monitoring.
GRIDSCAN 5000-HP	Accuracy of ± 10 % of reading or ± 15 ppm, whichever is greater, with a 25 ppm lower detection limit. For critical assets that need earlier warning.
GRIDSCAN 5010	Continuous self-calibration: the sensor calibrates without interrupting the measurement, so the record has no gaps.

An extended-range version is also available, from 250 to 50,000 ppm, for nitrogen blankets with high hydrogen concentrations such as network transformers or renewable sites with strong harmonic content. Ask for availability.

Repeatability, for consecutive measurements at the same concentration: ± 10 % of reading or ± 15 ppm.



C/ María Barbeito, 14
27003, Lugo, Spain

Contact

+T [+34] 982 20 99 20
info@amperis.com | www.amperis.com

TECHNICAL SPECIFICATIONS

Measuring range	25 to 5,000 ppm in oil; 25 to 5,000 ppm in-oil equivalent for the gas-phase version
Accuracy	±20 % of reading or ±25 ppm (±10 % or ±15 ppm on the high-performance version)
Repeatability	±10 % of reading or ±15 ppm, whichever is greater
Response time	Under 60 minutes
Cross-sensitivity	Below 2 % to H ₂ O, CO ₂ , C ₂ H ₂ , C ₂ H ₄ and CO
Data logging	1 year of history held in the unit
Insulating liquids	Mineral oil, silicone, natural ester and synthetic ester
Ambient temperature	-40 to 70 °C in service; -40 to 85 °C in storage
Medium temperature	-40 to 105 °C in oil; -40 to 80 °C in gas phase
Communications	Two-wire RS-485, Modbus RTU and DNP3; 19,200 baud, 8N1 as shipped
Power supply	12 to 48 VDC; 10 W maximum consumption
Mechanical connection	3/4"-14 NPT thread; 4-wire M12 electrical connector
Dimensions	151 × 39.6 × 39.6 mm
Ingress protection	IP68 to IEC 60529: 7.62 m of water for 14 days
Corrosion and humidity	C5M marine equivalent class, salt-water condensing (IEC 60068-2-11 and DIN EN ISO 12944)
Vibration and shock	Three-axis sinusoidal and random vibration, class 4M6 (IEC 60068-2-6 and 60068-2-64); 30 g shock for 18 ms (IEC 60068-2-27)
Wetted materials	316 stainless steel, 40 % mineral-filled nylon, polyimide, viton and hermetic glass-to-metal feed-through
Housing	Hard-anodised 6061 aluminium, 40 % mineral-filled nylon, viton and nickel-plated zinc on the connector
Certifications	CE marking, FM 6520:2022 in liquid phase, RoHS 2011/65/EU, IEC 61010-1, IEC 61326, IEC 61000-4-2 to 4-4, 4-6 and 4-8, IEC 60068-2-30
Warranty	3 years on the unit and 10 years on the hydrogen sensing element

Specifications subject to change without notice.



C/ María Barbeito, 14
27003, Lugo, Spain



Contact

+T [+34] 982 20 99 20
info@amperis.com | www.amperis.com