BROCHURE

Hydrogen-Moisture-Sensor

Dynamic Ratings

Distributed by AKRIBIS

DYNAMIC RATINGS

B100 Series

Electronic Temperature Monitor

- Improved Reliability
- Cost-Effective
- Maintenance-Free

RESPONSIVE
ASSET HEALTH SOLUTIONS

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Transformer Monitoring Made Easy

The B100 Series Electronic Temperature Monitor (ETM) is a complete monitoring solution for any distribution, transmission or generation transformer. This all-in-one solution replaces transformer analog gauges, provides accurate indication of problems inside the transformer via fault gas detection, and provides remote annunciation of any problems detected.

Available in 3 Mounting Options

IP31 / NEMA-2 Enclosure
Through Panel Mount

IP66 / NEMA-4 Enclosure

IP31 / NEMA-2 Enclosure
Surface Panel Mount

Improved Reliability

Gauges are known to stick, leaving the transformer unprotected. Worse, when the gauge sticks, there is no indication that alerts someone of the problem. The B100 has a robust design, and in the unlikely event that there is a problem, the device generates an alert, ensuring the problem can be corrected. The rugged, durable enclosure is designed for long life, ensuring protection against harsh environments created by water, dirt, dust and temperature extremes.The B100 also has fail safe contacts that turn cooling on in the event of a system problem.

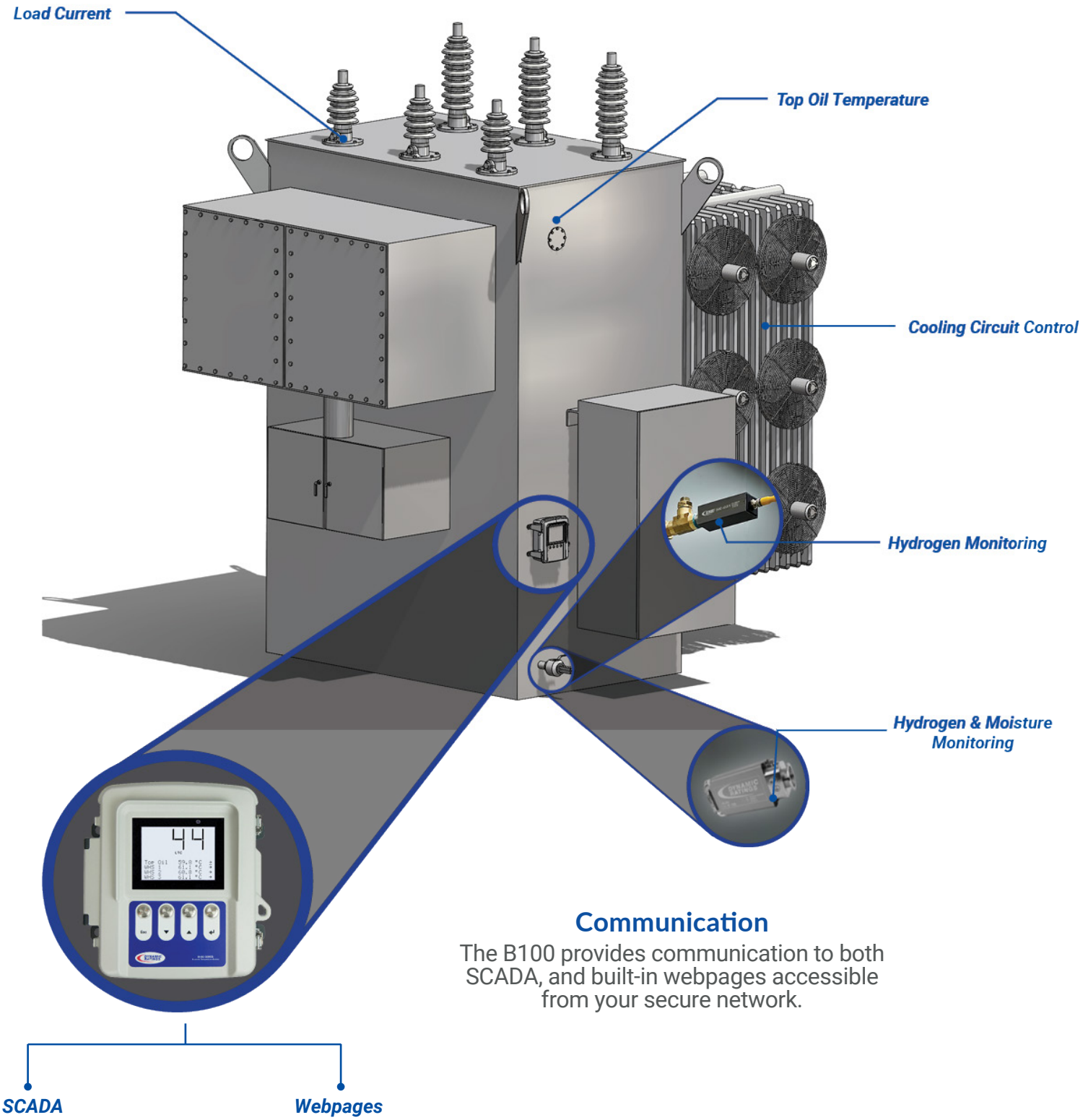
Cost Effective

Detection of gases in the transformer is the primary method of detecting transformer problems. The B100 with H_2 only or H_2+Moisture sensor option packages temperature and gas monitoring into a simple and low-cost solution. This new product combination integrates all of this functionality at roughly the same cost as discrete gauges.

Maintenance-Free

No calibration is required to maintain the accuracy of the B100 Transformer Monitor. The hydrogen sensor's patented auto-calibrated design also eliminates the need for on-site calibration.

Temperature, Hydrogen and Moisture Monitoring



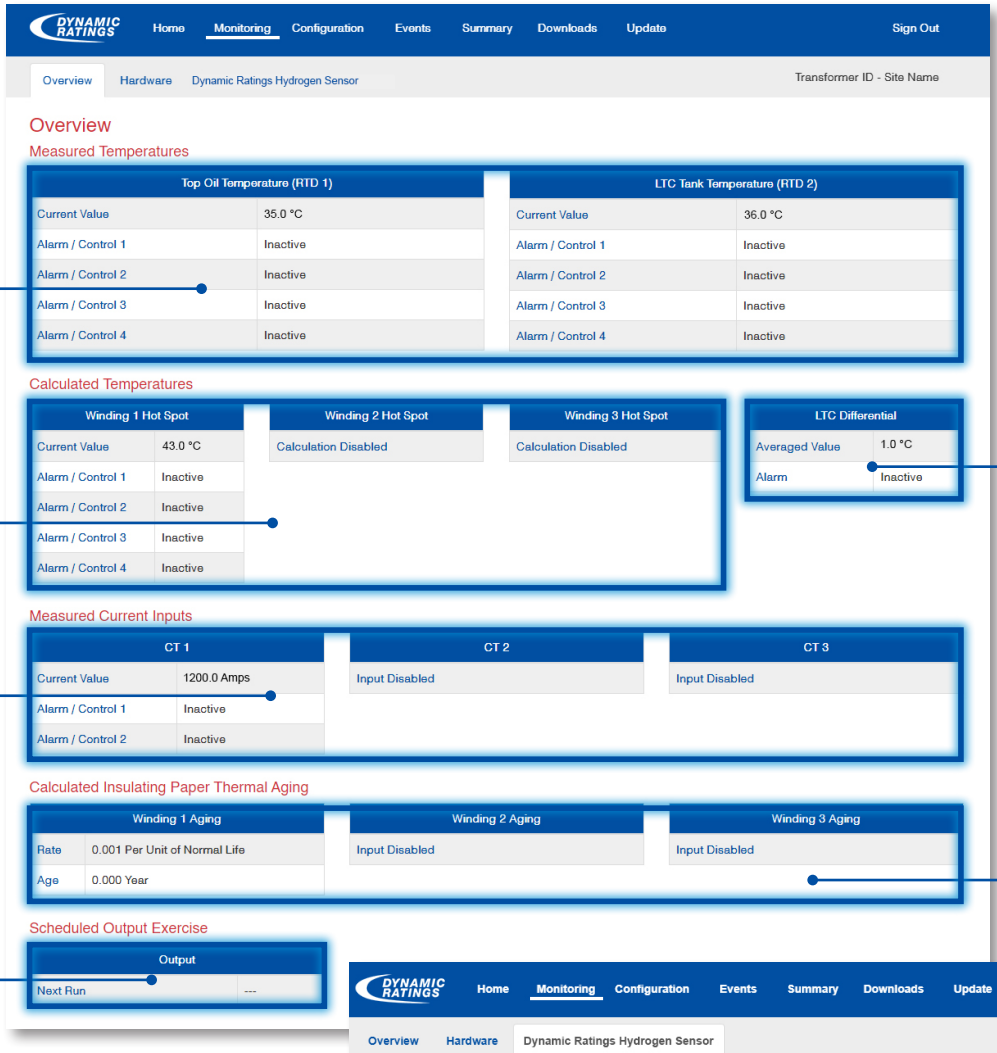
Communication

The B100 provides communication to both SCADA, and built-in webpages accessible from your secure network.

Webpage Features

B100 Software

Every B100 product comes with a software system to analyze and communicate the data gathered into an easy-to-understand format. This also has the added advantage of making information available at any time, and from a remote location. The dashboard provides all the critical information you need to determine the health of your transformer.



Live Temperature Readings

4 levels of alarm control for each temperature input.

Winding Hot Spot Temperatures

Calculates hot spot values for up to 3 windings.

Load Current Measurements

Measures up to 3 load currents.

Output Exercise

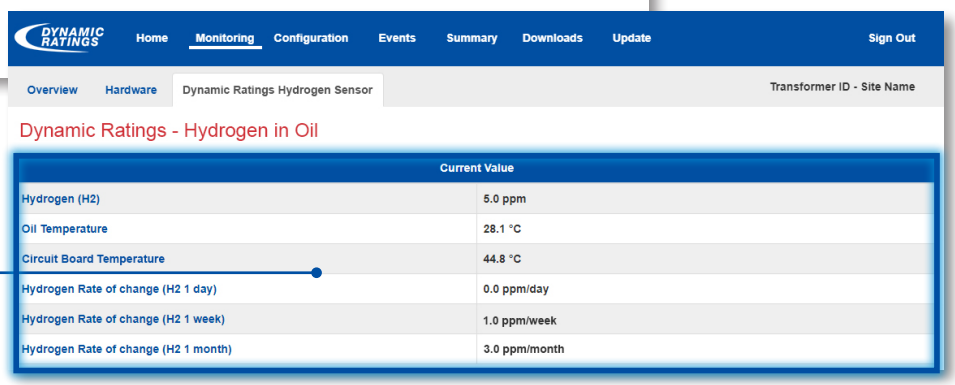
Offers the ability to schedule fan exercises at regular intervals.

LTC Delta T Monitoring

Compares LTC temperature to top oil temperature.

Insulating Aging

Accumulates the thermal aging in each transformer winding.



Current Value

View live data captured from the hydrogen sensor.

Available Monitoring Options

B100 Electronic Temperature Monitor

The B100 base model provides exceptional measurement accuracy, asset control and secure communications for any distribution, transmission or generation transformer.

B100 Electronic Temperature Monitor

Multiple gauges in one device

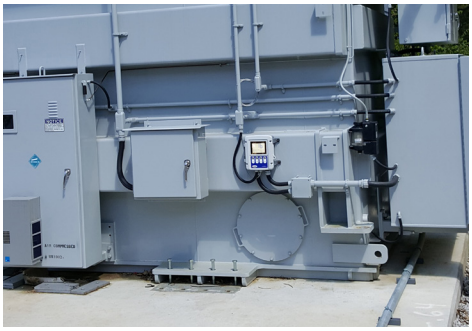
Top oil plus up to three winding temperatures, cooling circuit control, alarms, relay trips and LTC differential allows the B100 to replace up to five mechanical gauges.

Backlit LCD screen

The B100's backlit LCD screen is visible from 60 feet (18 meters) and cycles through critical temperature measurements, making it easy to read in low-visibility environments.

Historical data storage

Unlike gauges, the B100 stores the long term history of temperature data and alarm activations in real time or for download later.



Easy to configure

Configuration screens show an image of the terminals along with the matching configuration settings.

Easier testing

LEDs located beneath each relay makes testing easier.

Easy installation

Magnetic mount kit for the NEMA-4 instrument and magnetic top oil sensor facilitates quick and easy retrofit installations. B100 housing may be magnetically mounted for faster retrofit installations.

B100 With Hydrogen Only Sensing

The B100 with the optional hydrogen sensor provides the most cost-effective transformer monitoring solution available, combining all the features of the B100 with the additional features listed below.

B100 with Hydrogen Sensing

Early Fault Indication

Faults within a transformer will generate gases based on the temperature at the location of the fault. Hydrogen is the first fault gas generated, thus providing the earliest indication of a problem. The volume of hydrogen generated will increase as the severity of the fault increases.

Measurement Accuracy

There are two types of hydrogen sensors - fuel cell sensors and thin film sensors. Fuel cell sensors consume the hydrogen, and if placed in a small volume of oil, it will eventually degas the oil unless an oil pump or other method of circulation is installed.
Thin film sensors do not change the concentration of hydrogen in the oil, and therefore will give a more accurate reading.

Two Installation Options

When fault gases are generated in a transformer, they will be dissolved in the oil where sensors will detect the increasing trend and provide a warning of the equipment problem. Because hydrogen takes time to dissolve in oil, it will accumulate in the headspace quickly. While using an in-oil sensor is effective, the use of a gas space sensor will typically provide a faster response. Both in-oil and gas space sensors are available for use with the B100.

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Available Monitoring Options

B100 With Hydrogen and Moisture Sensing

The B100 with the optional Hydrogen and Moisture sensor provides the ability to monitor temperature values provided by the B100 along with dissolved hydrogen, moisture content, temperature and pressure of oil.

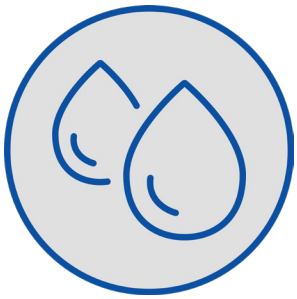
B100 with Hydrogen & Moisture Sensing

Improved Service Life

Excessive moisture in the insulating paper of the windings will reduce the dielectric strength and also reduce the partial discharge inception voltage. These both will make the transformer more susceptible to faults. By monitoring moisture in addition to other temperature values provided by the B100 ETM, customers can detect problematic conditions within the transformer far before a fault occurs.

Compact Solution

The Dynamic Ratings Hydrogen and Moisture sensor is a compact solution for monitoring moisture in oil. It is equipped with an RS-485 Modbus output with programmable baud rate.



Multi-Parameter Flexibility

The hydrogen and moisture sensor has the ability to provide pressure and temperature of oil for better trending of hydrogen and moisture readings. These additional parameters are useful in identifying potential leaks in the transformer and correlation of temperature to moisture values.

Easy Installation

Its stainless steel IP68 housing makes it suitable for rugged substation environments, and offers simple installation with a ½" NPT connection (adaptor fittings available).

Accessories & Specifications

Sensors & Accessories

CT-054[1]	Auxiliary CT: Split Core CT 1000:1 Ratio w/ 5A Primary
CT-055[1]	Auxiliary CT: Fixed Core CT 1000:1 Ratio w/ 5A Primary
SE-060[1]	RTD temperature sensor probe for 1/2" NPT Thermal Well
MMTS-3C	Magnetic Mount Temperature Sensor (3 wire PT-100 RTD) *Includes 1/2" NPT conduit connection*
MMTS-3Wxx	Magnetic Mount Temperature Sensor (3 wire PT-100 RTD) *Includes stainless steel armored cable. Specify length of 25 ft., 50 ft. or 75 ft. (7.62m, 15.24m or 22.86m)
MMK-B100	Magnetic Mounting Kit for B100
CAB-0012	H_2 Scan Rugged, Twisted pair, Shielded, UV resistant Cable Specify length of 25 ft., 50 ft. or 75 ft. (7.62m, 15.24m or 22.86m)
HDW-107[2]	1" Male x 3/4" Female NTP Stainless Steel DGA Fitting Adapter
HDW-108[2]	2" Male x 3/4" Female NTP Stainless Steel DGA Fitting Adapter

[1] *Minimum required: RTD for top oil and one CT for winding temperature.*
[2] *Contact factory for additional sizes*

B100 Specifications

Power Requirements	48 - 240 VDC or 110 - 240 VAC (50 – 60 Hz)
Temperature Range	-40°C to 70°C (-40°F to 158°F)
Communications	USB, Ethernet, RS485 (optional), Serial Fiber (optional), DNP, Modbus, IEC 61850
Display Info	Tempered glass with FSTN display technology (black on white), transflective with anti-UV coating

Hydrogen Sensor Specifications

	Dissolved Hydrogen In-Oil	Hydrogen in Headspace
Measurement Range	25-5000 ppm	25-5000 ppm *in liquid equivalent
Accuracy	20% of reading or 25 ppm, whichever is greater	500 ppm to 25 ppm
Repeatability	10% of reading or 15 ppm, whichever is greater	300 ppm to 15ppm
Operating Temp	-40°C to 70°C (-40°F to 158°F)	-40°C to 70°C (-40°F to 158°F)
Storage Temp	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)
Oil Temp Range	-40°C to 105°C (-40°F to 221°F)	N/A
Cross Sensitivity	< 1%	< 2%

Hydrogen + Moisture Sensor Specifications

	Temperature	Hydrogen	Moisture	Pressure
Measurement Range	-40 to 125°C (-40 to 257°F)	25 to 5000 ppm	0 to 95% RS 1 to 10000 PPM	0 to 205 kPa
Accuracy	±0.1°C	20% of reading or ±25 ppm, whichever is greater	±2% RS	±2% FS
Operating Temp	-40 to 70°C (-40 to 158°F)			
Storage Temp	-40 to 85°C (-40 to 185°F)			

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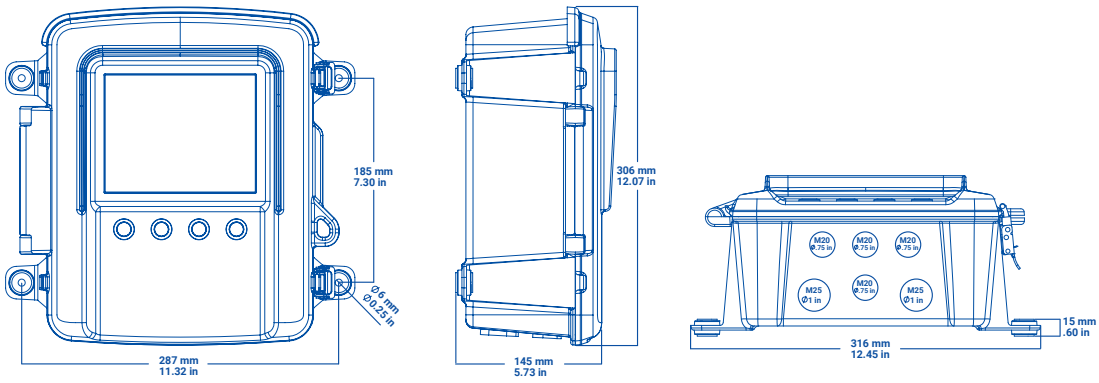
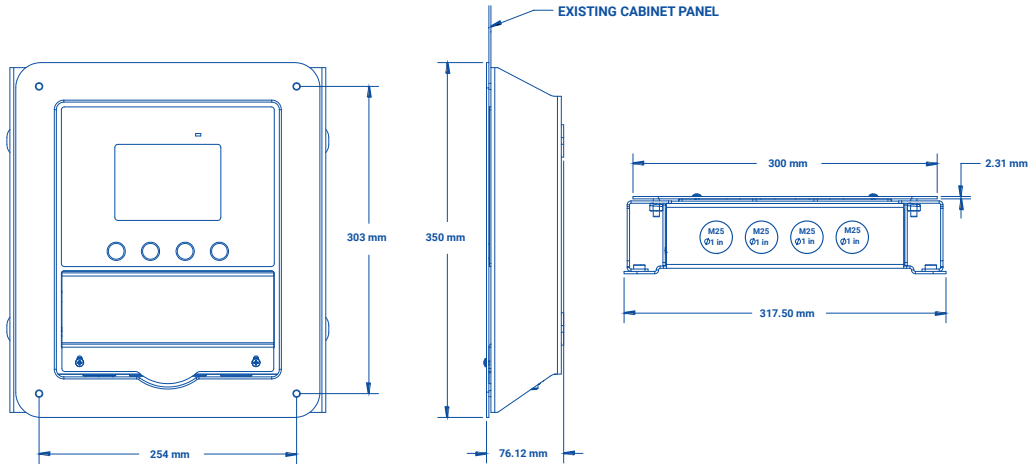
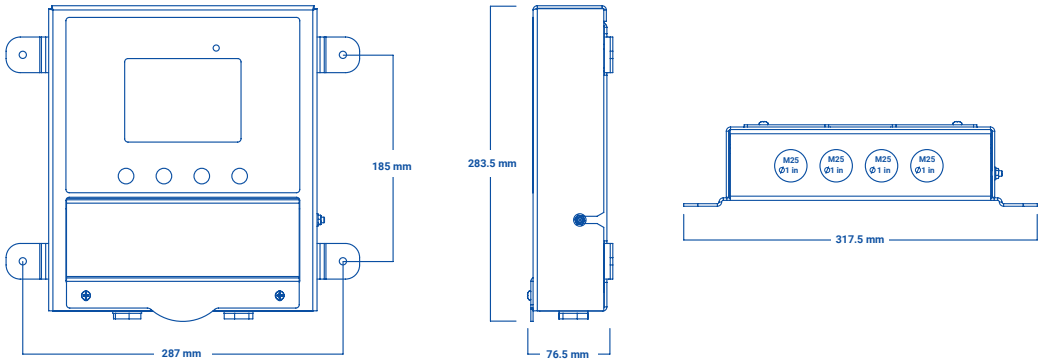
IP66 (NEMA-4) Enclosure



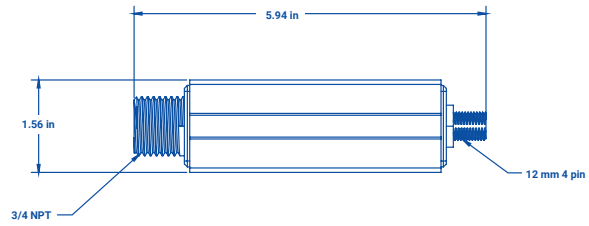
IP31 (NEMA-2) Through Panel Mount



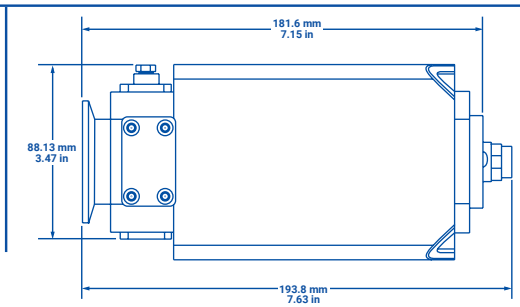
IP31 (NEMA-2) Surface Panel Mount



Hydrogen Sensor



Hydrogen + Moisture Sensor



DYNAMIC RATINGS

An ISO 9001, ISO 14001, ISO 27001, ISO 45001 Certified Company.

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