

MECHANICAL POWER TRANSMISSION

ABB Ability™ Smart Sensor

For mechanical products

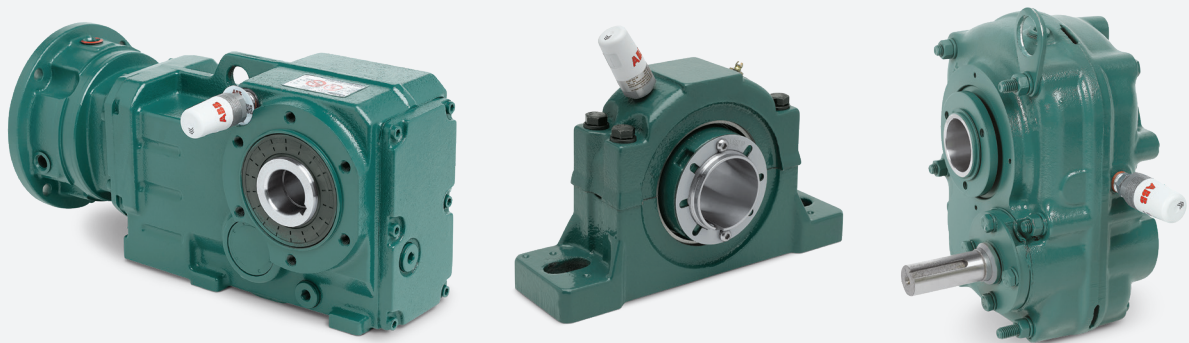


ABB Ability Smart Sensor for mechanical products

Changes in temperature and vibration can indicate potential problems in mounted bearings and gear reducers. Yet understanding the health of these mechanical products is often overlooked, leaving problems unnoticed until failure occurs. ABB now makes it easier and safer to know how your products feel.

ABB Ability connects you to the power of the Industrial Internet of Things (IIoT). ABB offers a unique digital advantage by combining connectivity and data analytics with our expertise to make your operations efficient, predictable and safe.

The ABB Ability Smart Sensor for mechanical products is an easy-to-use, wireless sensor which monitors the health of ABB Dodge mechanical products, allowing users to reduce downtime, improve reliability, and operate safely.

- Increased safety ●—●
- Increased productivity ●—●
- Reduced maintenance ●—●
- Eliminated unplanned stops ●—●
- Easy to use ●—●



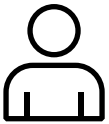
<https://new.abb.com/mechanical-power-transmission/smart-sensor-for-mechanical-products>

Do your mechanical products talk to you?

This is why they should



Traditional way



Routine maintenance introduces safety hazards as employees are working around rotating equipment or trying to reach mechanical products that are difficult or dangerous to access.

Not knowing the health of your mechanical products leaves you at risk for untimely equipment failure, which can lead to process interruption, unplanned downtime, and lost revenue.

Maintenance is a routine schedule based on a combination of experience, training and "this is how we always do it".

The user has little visibility of when component failure may occur.

With ABB Ability Smart Sensor



Increased safety

The ability to monitor mechanical products remotely allows maintenance and other relevant personnel to safely get a health check of the products without touching equipment.

Increased productivity

Trending data helps to develop patterns for monitoring performance and ability to predict replacement.

Reduced maintenance

Maintenance can now be planned according to actual needs rather than based on generic schedules.

Eliminate unplanned downtime

Warnings on decreasing health status allow you to plan maintenance before there is a problem and the system is down.

Easy to use

Wireless

Sensor is battery operated, no wiring, special tools or special software required.



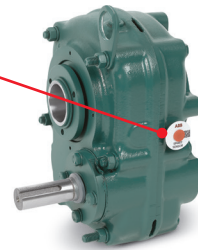
Easy installation

ABB mechanical products come sensor ready with drilled, threaded, and plugged installation holes. The sensor is installed by removing the plug and threading the sensor into the provided receptacle.



Retrofitting – no problem

Adapters designed to accept smart sensor are available for easy installation in the field. The gearing adapters replace one of several oil fill plugs with a blind plug. The sensor adapter for bearings replaces the standard grease fitting in the housing, allows for easy installation of the sensor, and provides a grease port for continued hand lubrication of the bearing.

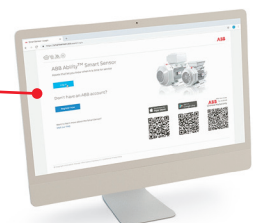


Easy activation

The sensor is activated by pressing the LED activation switch.



Complimentary access to ABB Ability for data trending



Easy to use

No matter where you are

Machinery is working even when you are not. Advanced condition monitoring is now hand held through the Smart Sensor Platform app. Designed with ease in mind, the app allows you to get up to date information on all mechanical products at any time, no matter where you are. Simply download ABB Ability Smart Sensor App for any iOS or Android based device.

Intuitive interface

The simple, graphical interface is easy to use and understand.

Traffic light system

Health is displayed with a traffic light icon to quickly show users the state of that product.

Push notifications

When conditions change, you want to be the first to know. ABB Ability allows you to get notifications based on your preferences.

Constant communication

When events happen, everyone in the organization can know. This also allows records of who closes the events and what comments are made.

Event log

All maintenance performed on mechanical products can be scheduled and recorded in the app, providing an easy to access record of service.

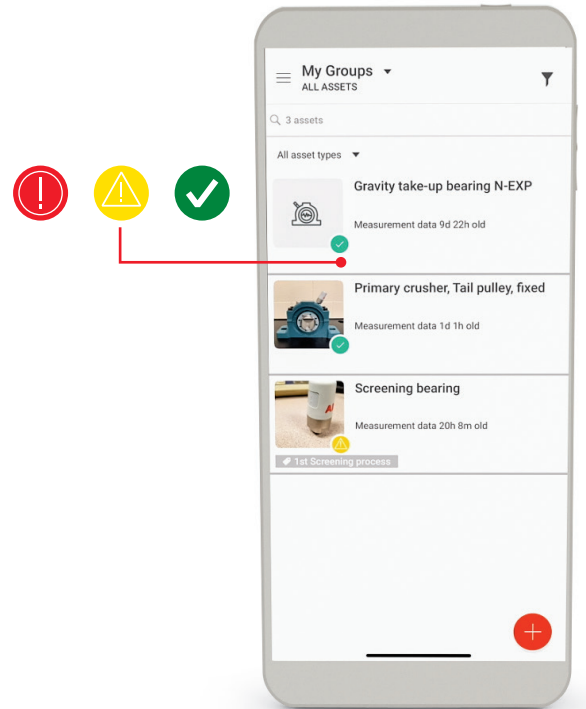
Asset identification

Each product is registered through a part number, which provides a reference when it comes time to replace.

Access in remote locations

When mechanical products are located in difficult to reach locations or out of mobile device range, sensor data can be automatically sent via Bluetooth Low Energy to the ABB Ability platform using a Gateway.

Twenty Smart Sensors can be connected to one Gateway.



Safe to use

Cyber security

ABB understands the importance of protecting your data, and we take this responsibility seriously. The ABB Ability Smart Sensor for mechanical products adheres to strict security measures to ensure that the health of your mechanical products are all you need to worry about.

Data ownership

- You own all of your data.
- Your data cannot be accessed by anyone outside your company unless you have authorized them in the portal.

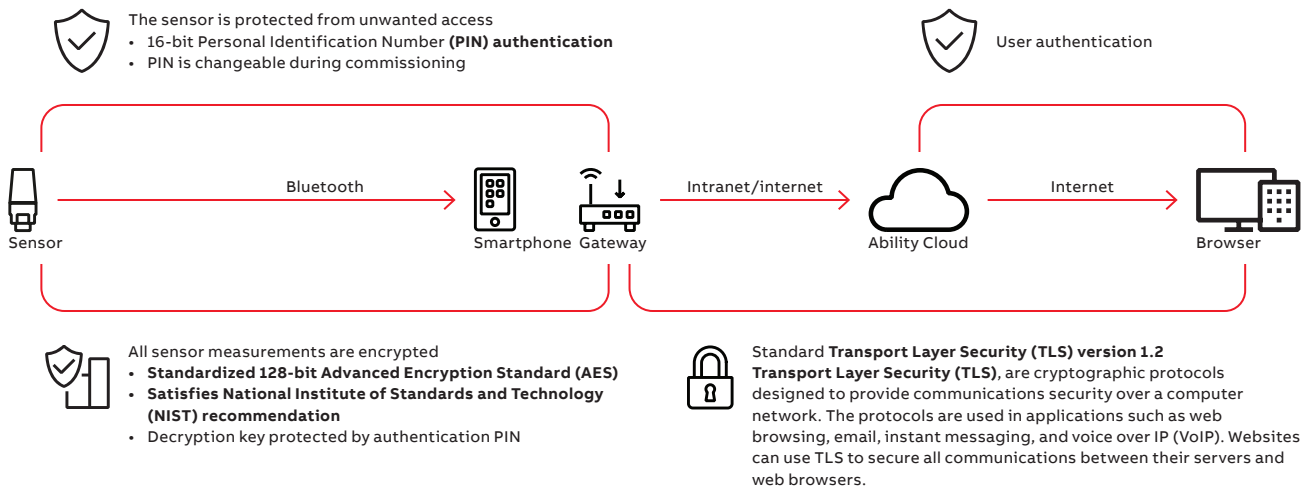
The sensor is protected from unwanted access

- 16-bit Personal Identification Number (PIN) authentication
- PIN is changeable during commissioning as well as during normal sensor usage (Default PIN is 0000)
- PIN throttling prevents brute-force attacks

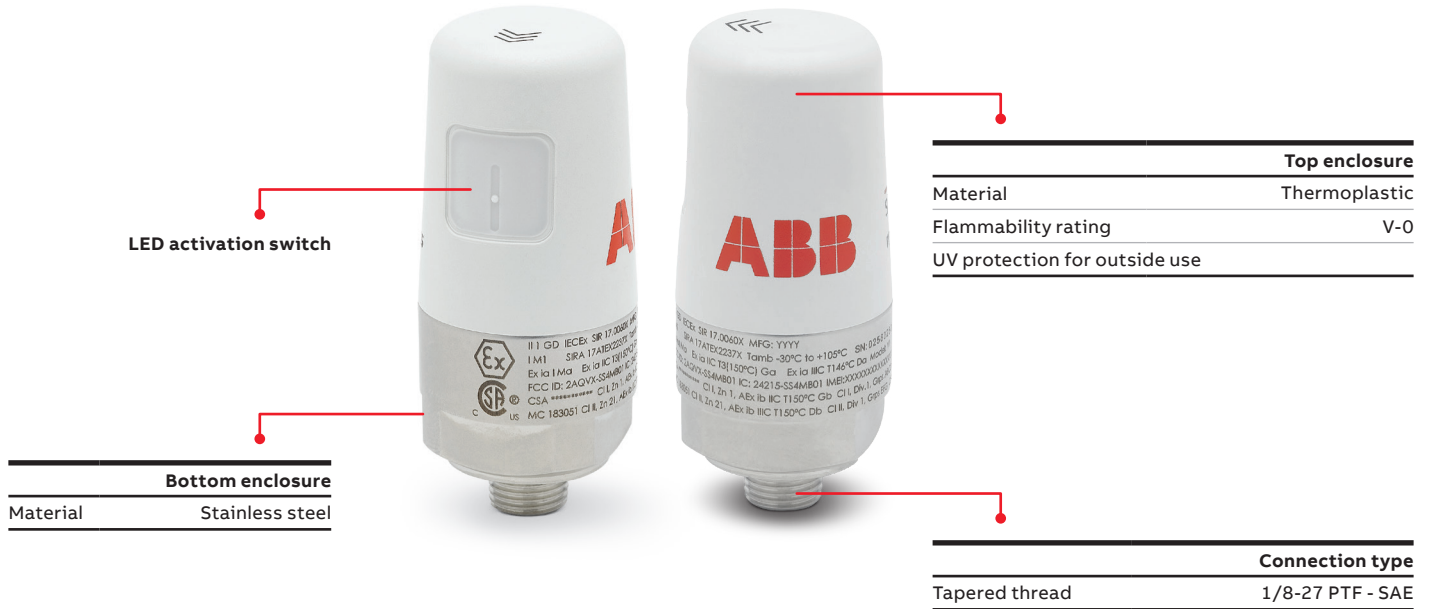
All sensor measurements are encrypted

- By recommendation of National Institute of Standards and Technology (NIST)
- Decryption key is protected by authentication PIN

Secure communication system overview



Safe to use Certificates

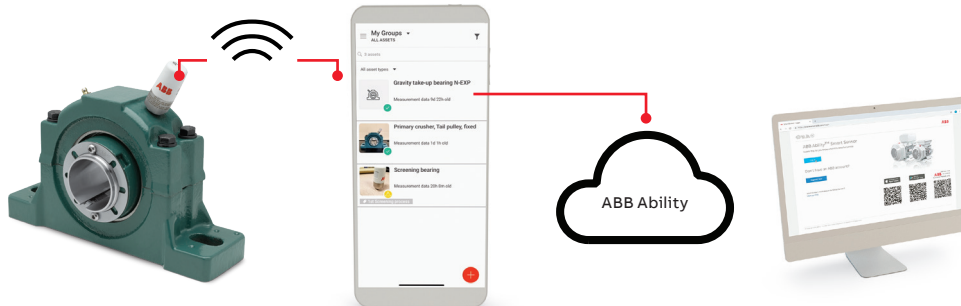


| | | | | | | |
|--|--|--|--|--|--|----------|
| | II 1 GD IECEx SIR 17.0060X MFG: YYYY IP 66 I M1 SIRA 17ATEX2237X Tamb -30°C to +105°C SN: NNNNNNNN Ex Ia I Ma Ex Ia IIC 150°C (T3) Ga Ex Ia IIIC T146°C Da Model: V1 FCC ID: 2AQVX-SS4MB01 IC:24215-SS4MB01 IFT:RCPABV118-2199 CSA 19CA70215658 CI I, Zn 0, AEx Ia IIC 150°C Ga CI I, Div.1, Grps ABCD MC 274769 CI II, Zn 20, AEx Ia IIIC T146°C Da CI II, Div 1, Grps EFG CI III, Div 1 | | | | ABB Motors and Mechanical Inc. 5711 R.S. Boreham Jr. Street Fort Smith, AR 72901, USA | 0518 |
|--|--|--|--|--|--|----------|

Third-party hazardous location certified (intrinsically safe)

When it comes to applications in hazardous environments, there's no reason for customers to assume any risk by using a product which is self certified. That's why the ABB Ability Smart Sensor for mechanical products is third party ATEX certified for worry-free use in hazardous environments. All required product markings and documentation are included with each sensor at no additional charge. When it comes to hazardous environments, you can trust ABB Ability Smart Sensor for mechanical products.

ABB Ability portal



The Smart Sensor for mechanical products includes complimentary access to the ABB Ability digital platform. This portal allows you to monitor function and analyze data trends, leading to better uptime and ensuring that critical operations run smoothly and consistently.

The sensor uses Bluetooth Low Energy to wirelessly communicate information about the mechanical products operational health via your smartphone or bluetooth-gateway to a secure server. Data from the sensor can be displayed graphically on a smart phone, tablet or the ABB Ability web portal.

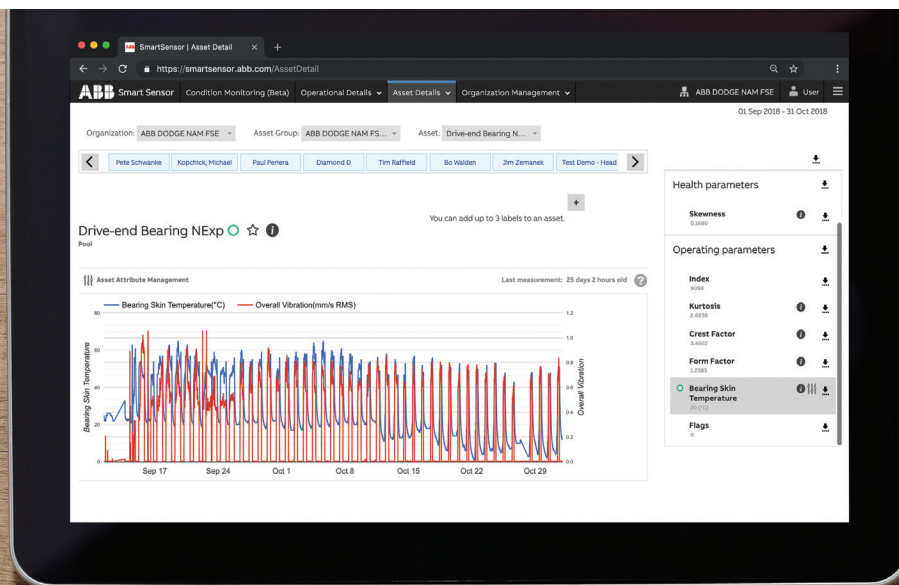
Trending data

Allows users the ability to zoom in and pin point certain events. Users can customize preferences and plot data relevant to them. This data is available to download to Microsoft Excel.

Advanced algorithms are loaded into ABB Ability to help direct proper maintenance and decrease unexpected down time.

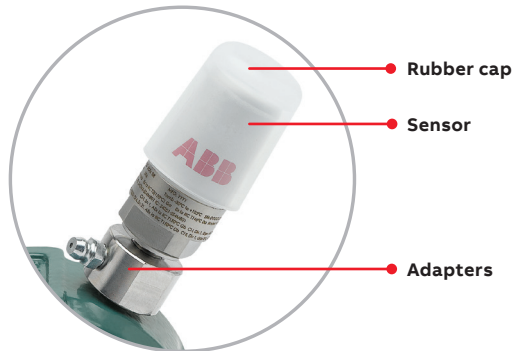


<https://smartsensor.abb.com/Login>

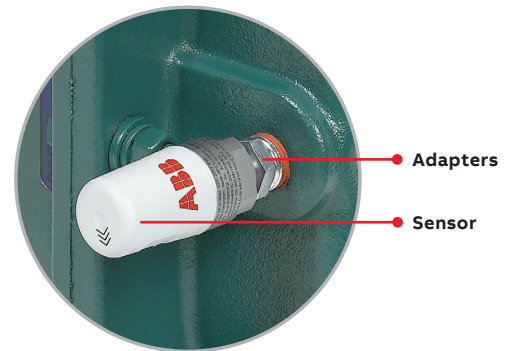


Part number information

Bearing



Gearing



| Part number | Description |
|---|---|
| 750000 | Smart Sensor for mounted bearings |
| Smart Sensor adapters for mounted bearings | |
| 749904 | 1/8" - 27 pipe thread adapter |
| 749905 | 1/4" - 28 straight thread adapter |
| 749915 | M6X0.75 adapter |
| 137994 | 1/8"-27 dual for auto lube adapter |
| Smart Sensor adapters for gearboxes | |
| 966905 | 3/8" NPT to 1/8" NPSM sensor hardware kit |
| 966906 | 1/2" NPT to 1/8" NPSM sensor hardware kit |
| 966907 | 3/4" NPT to 1/8" NPSM sensor hardware kit |
| Bluetooth Gateway | |
| 749908 | Bluetooth Gateway |

Adapter retrofit charts

An adapter is available for retrofitting existing Dodge mechanical products with an ABB Ability Smart Sensor.

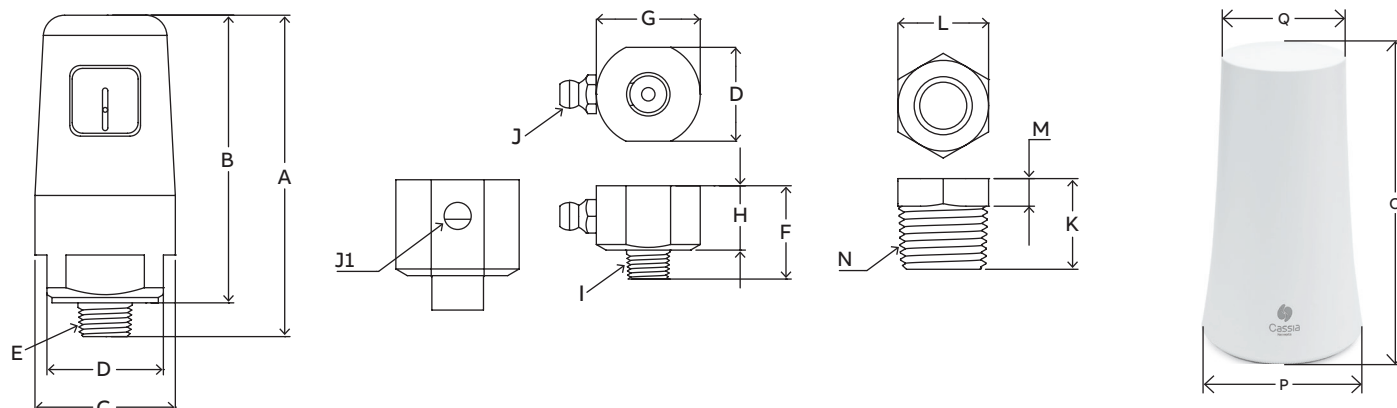
| Mounted bearing product | Product description | Sensor adapter compatible | Sensor adapter size | | Housing style |
|---------------------------|---|---------------------------|--------------------------------|--------------------------------|--------------------|
| | | | 1/8" - 27 adapter PN 749904 | 1/4" - 28 adapter PN 749905 | |
| Ball bearings | Washdown ball bearings | Yes | No | Yes | Pillow blocks only |
| Ball bearings | Standard cast iron ball bearings | Yes | 204 series and larger | Yes, for 203 series only | Pillow blocks only |
| Spherical roller bearings | All spherical roller bearing products | Yes | Yes | No | Pillow blocks only |
| Tapered roller bearings | Type E | Yes | Yes | No | Pillow blocks only |
| Tapered roller bearings | Split cap tapered products-Type EXL, Double Interlock®, TAF, Type K, Type C, Special Duty | No | | | N/A |
| Plain bearings | Sleevoil® and journal bearings | No | | | N/A |



| Adapter Description and part number | Quantis RHB, ILH and MSM | TXT | TAII | MTA | Maxum XTR | MagnaGear |
|-------------------------------------|--------------------------|-------------|------------|-----------|-----------|---------------|
| 3/8 NPT to 1/8" P/N: 966905 | Sizes 38-128 | Sizes 1-4 | Sizes 0-3 | Sizes 2-3 | - | - |
| 1/2 NPT to 1/8" P/N: 966906 | - | Sizes 5 & 6 | - | - | All sizes | - |
| 3/4 NPT to 1/8" P/N: 966907 | Sizes 148-168 | Sizes 7-12 | Sizes 4-12 | Sizes 4-8 | - | Sizes 100-920 |

Smart Sensor

Dimensions & installation



Note: Drawings are not to scale.

Smart Sensor dimensions

| Part number | Description | Dimensions | | | | |
|-------------|-----------------------------------|-------------|--------------|-------------|----------|-----------------|
| | | A | B | C | D | E |
| 750000 | Smart Sensor for mounted bearings | 2.38 (60.5) | 2.13 (54.14) | 1.04 (26.4) | 7/8 (22) | 1/8"-27 PTF-SAE |

Smart Sensor adapters for mounted bearings dimensions

| Part number | Description | Dimensions | | | | |
|-------------|--------------------------------------|--------------|--------------|--------------|----------------------|----------------------|
| | | F | G | H | I | J, J1 |
| 749904 | 1/8" - 27 pipe thread adapter | | | | 1/8" - 27 PTF-SAE | |
| 749905 | 1/4" - 28 straight thread adapter | 0.88 (22) | 0.97 (24.61) | 0.61 (15.37) | 1/4" - 28 UNF-SAE | 1/4" - 28 HYD GR FTG |
| 749915 | M6X0.75 adapter | | | | M6X0.75 taper thread | |
| 137994 | 1/8" - 27 dual for auto lube adapter | 1.19 (30.16) | | 0.92 (23.3) | 1/8" - 27 PTF-SAE | 1/8" - 27 NPT hole |

Smart Sensor adapters for gearboxes dimensions

| Part number | Description | Dimensions | | | |
|-------------|---|--------------|----------------|-------------|---------------|
| | | K | L | M | N |
| 966905 | 3/8 NPT to 1/8 NPSM sensor hardware kit | 0.69 (17.53) | 11/16 (17.19) | 0.21 (5.33) | 3/8" - 18 NPT |
| 966906 | 1/2 NPT to 1/8 NPSM sensor hardware kit | 0.81 (20.57) | 7/8 (22.23) | 0.25 (6.35) | 1/2" - 14 NPT |
| 966907 | 3/4 NPT to 1/8 NPSM sensor hardware kit | 0.93 (23.62) | 1-1/16 (26.99) | 0.30 (7.62) | 3/4" - 14 NPT |

Bluetooth Gateway dimensions

| Part number | Description | Dimensions | | |
|-------------|-------------------|-------------|------------|------------|
| | | O | P | Q |
| 749908 | Bluetooth Gateway | 10.20 (259) | 5.63 (143) | 4.05 (103) |

Installation information*

| Description | Torque (lb.-in.) |
|---------------------------------|------------------|
| Smart Sensor/ sensor adapter | 7 to 12 |

*Using torque wrench

Note: Installation and maintenance instructions for Dodge products available at new.abb.com

Technical data

| Certification(s) | |
|-------------------------------|---|
| | II 1 GD |
| | I M1 |
| | Ex ia I Ma |
| EX (hazardous areas) | Ex ia IIC 150°C (T3) Ga |
| | Ex ia IIIC T146°C Da |
| | CI I, Zn 0, AEx ia IIC T150°C Ga |
| | CI I, Div.1, Grps ABCD |
| | CI II, Zn 20, AEx ia IIIC T146°C Da |
| | CI II, Div 1, Grps EFG |
| | CI III, Div 1 |
| IP (Ingress Protection) class | IP 66 |
| Temperature | |
| Measurement range | -22°F... +185°F (-30°C ... +85°C) |
| Resolution | 1°C |
| Accuracy | ±2°C |
| Vibration | |
| Amplitude range | +/- 2g |
| Frequency range | 1 Hz – 1.6 kHz |
| Detection type | RMS |
| Wireless communication | |
| Network standard | Bluetooth Low Energy |
| Radio standard | IEEE 802.15.1C |
| Frequency | 2402-2480 MHz |
| Range (nominal) | Up to 70 ft (20 m) via mobile device |
| Environmental | |
| Storage temperature | +14°F ... +86°F (-10°C ... +30°C) |
| Operating temperature | -22°F... +185°F (-30°C ... +85°C) |
| Power | |
| Battery type | 3.6V LiSOCl ₂ cells |
| | Lithium thionyl chloride cell battery is not replaceable |
| | -22°F...+122°F (-30°C ... +50°C) |
| Estimated battery life* | 2+ years with measurement taken once per hour and data collected once per day by mobile device. |
| | +123°F...+185°F (+51°C ... +85°C) |
| | 1+ year with measurement taken once per hour and data collected once per day by mobile device. |
| Physical | |
| Weight | 60 grams |
| Case material | Stainless steel/thermoplastic/silicone |
| Dimension | 60.5mm x 26.4mm |
| Mounting | Male 1/8" - 27 PTF SAE |

Helpful websites



Smart Sensor app:

One stop shop for sensor commissioning and condition monitoring for users on the go – app provides easy 'at-a-glance' overview of asset conditioning.



Apple store
<https://apps.apple.com/us/app/smart-sensor-platform/id1222531884>



Google Play store
<https://play.google.com/store/apps/details?id=com.abb.ability.smartsensor>

Condition monitoring portal:

One stop shop for condition monitoring, user and asset group setup, and organizational management. Users can view temperature and vibration trends for any given asset within their organization.



<https://smartsensor.abb.com/Login?returnUrl=https://smartsensor.abb.com/AssetDetail/Index?id=13503>

Powertrain portal:

Allows users to overlay KPI's from multiple assets at once, provides easy comparison of data from different assets beyond basic functionality of condition monitoring portal.



<https://powertrain.abb.com/Login>

Additional information

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