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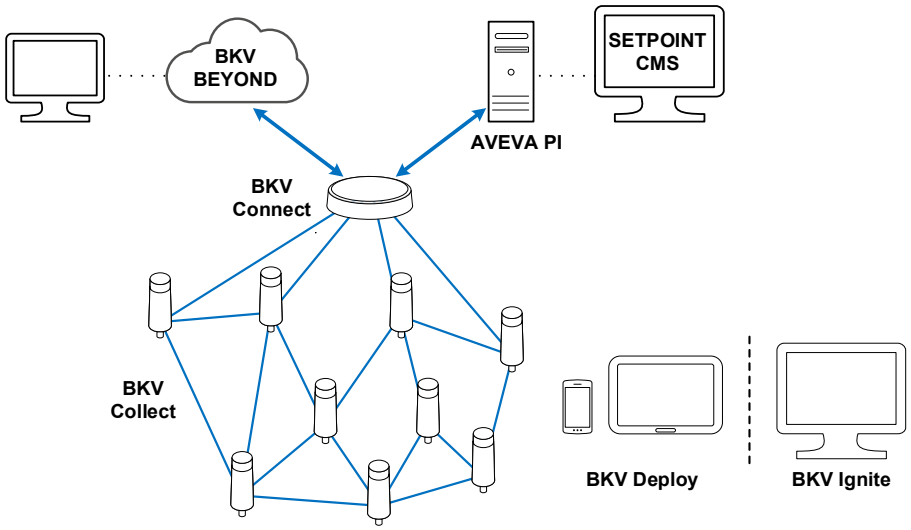
BKV Wireless Sensor Solution

Product specifications and ordering information



Overview

When there is a need for high density of connected devices, a mesh network is the perfect solution for connectivity. In a mesh network, devices transmit their own sensor data and act as a relay for other devices. Relays provide the best and most efficient communication path to a gateway.

The BKV Connect 1 & 2 gateways connect a mesh network of a few to several dozens of wireless devices to a backend. They exchange data with the mesh network and can process, store, and send data to local or cloud backends. BKV Connect 1 & 2 can be connected to the internet over a wired Ethernet connection or wirelessly over a Wi-Fi or cellular connection (LTE CAT M1 or 2G).

The BKV Connect 2 (gateway in protective enclosure) can be used in outdoor or industrial environments that require a higher degree of water and dust protection.

The BKV Collect 6 & 6 Ex is a wireless battery-operated sensor for condition monitoring and predictive maintenance. It measures tri-axial vibration and surface temperature of rotating equipment, such as pumps, motors and compressors.

Abnormal machine vibrations or high temperatures may give early signs of failure due component imbalance, misalignment, wear or improper use of equipment.

The BKV Collect 6 & 6 Ex operates in a mesh network and transmits sensor data directly or via other BKV Collect 6 & 6 Ex to a BKV Connect 1 & 2. Typically, the data is sent from the BKV Connect 1 & 2 to a backend (BKV BEYOND or Setpoint CMS based on AVEVA PI) for storage and further analysis. Once the BKV Collect 6 & 6 Ex is switched on, it starts automatically to measure and transmit data at pre-configured intervals.

Depending on the configuration a BKV Collect 6 & 6 Ex can send raw vibration data and/or pre-calculated values, such as RMS velocity, Fast Fourier Transform (FFT), Crest factor and many more via the gateway.

BKV Collect 6 Ex (wireless sensor for hazardous areas) variant is designed for vibration and temperature monitoring of rotating equipment in potentially explosive atmospheres.

For further information, read the instructions.

Please make sure to read the detailed instructions in the BKV Wireless Sensor Solution Instructions or at www.bkvibro.com.

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Specifications

For additional information and specifications refer to the following documents:

Document	Number
BKV Wireless Sensor Solution, Instructions	C108377
BKV Connect 1 & 2 / BKV Collect 6 & 6 Ex, Quickstart Guide	C108376

BKV Connect 1 & 2		
Type	Gateway to connect BKV Collect wireless sensors	
Mesh network wireless communication	2.4 GHz ISM band low energy mesh radio network (maximum power +4 dBm)	
Power source	BKV Connect 1: BKV Connect 2:	5V DC Voltage range 85-264 VAC, frequency range 47-440 Hz, power consumption 30 VA maximum
Connectivity	2G, LTE CAT M1 Wi-Fi 2.4 GHz Ethernet RJ45	
Cyber security - Sensor to gateway communication	All communication, including protocol headers, is protected by 128-bit encryption key.	
Cyber security - Gateway/App to host network communication	Usernames and passwords (unique to each gateway) Iptables for firewall MQTT over HTTPS/Secure Websockets using TLS 1.2	
Sensor to gateway (direct) maximum range (depending on plant topology)	Theoretical: Typical: Obstructions:	Up to 100 m (328 ft) with low complex data and infrequent data transmission Up to 50-60 m (164-197 ft) with default configuration < 10 m (< 32.8 ft) in case of obstructions (concrete walls, metal covers, etc.)
Dimensions	BKV Connect 1: BKV Connect 2:	ø95 x 18.3 mm (ø3.74 x 0.72 in) 180 mm x 130 mm x 81 mm (7.1 x 5.12 x 3.19 in) (excluding cable sealing clamps)
Weight	BKV Connect 1: BKV Connect 2:	approx. 340 g (12 oz) approx. 640 g (22.6 oz)
Material	BKV Connect 1: BKV Connect 2:	Polycarbonate Polycarbonate & TPE (gaskets)
Operating temperature range	BKV Connect 1: BKV Connect 2:	0°C to +50 °C (32°F to +122 °F) -20°C to +50 °C (-4°F to +122 °F)
Relative humidity range	20 – 90 % (non condensing)	
Storage temperature range	-40 °C to +85 °C (-40 °F to +185 °F)	
Degree of protection	BKV Connect 1: BKV Connect 2:	IP20 IP66/ IP67

BKV Collect 6 & 6 Ex	
Type	Triaxial MEMS based vibration sensor with integrated temperature measurement
Vibration measurement	Acceleration: RMS, peak, peak-peak Velocity: RMS, peak, peak-peak Others: Kurtosis, Crest factor and raw data (time waveform)
Frequency range	10 - 6300 Hz +- 3dB
Dynamic range	2, 4, 8 or 16g (configurable)
Sampling rate	26.7 kHz
Default configuration	Triaxial acceleration and temperature measurement A-RMS, Crest factor and v-RMS (10-1000 Hz): every 12 hours Raw data (time waveform): every 24 hours Sample amount: 36.864 per axis = 110.592 in total Dynamic range: 4G
Temperature measurement range	-40°C to +105 °C (-40 °F to +221 °F)
Mesh network wireless communication	2.4 GHz ISM band low energy mesh radio network (maximum power +4 dBm)
Power source	Non replaceable 3.6 V A lithium thionyl chloride (LI-SOCl2) battery
Battery lifetime	Based on default configuration up to 5 years (depending on configuration and surrounding conditions). Main effect on battery life is caused by: Ambient temperature, update frequency, data processing, amount of samples, sending data and routing of sensors
Cyber security - Sensor to gateway communication	All communication, including protocol headers, is protected by 128-bit encryption key.
Dimensions	78.5 x 28 mm (3.09 x 1.1 in)
Weight	129 g (4.55 oz)
Mounting	Inbuilt M8 threaded stud
Material	Body: 316 stainless steels Top cap: PE HD
Operating temperature range	-40°C to +85 °C (-40°F to +185 °F)
Storage temperature range	Not exceeding +30 °C (+86 °F) is recommended
Degree of protection	IP67

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Explosion Protection

The following applies to the BKV Collect 6 Ex (sensor in Ex-certified variant):

ATEX & IECEx markings	II 2 G Ex ib IIC T4 Gb II 2 D Ex ib IIIC T135°C Db Ambient Temperature: -40 °C to +60 °C | -40 °F to +140 °F
MET markings	Class I Zone 1 AEx ib IIC T4 Gb Zone 21 AEx ib IIIC T135°C Db Class I, Division 2, Groups A,B,C,D T4 Class II, Division 2, Groups F,G T4 Class III, Division 2 Ex ib IIC T4 Gb Ex ib IIIC T135°C Db Ambient Temperature: -40 °C to +60 °C | -40 °F to +140 °F
Standards	ATEX: EN IEC 60079-0:2018 EN 60079-11:2012 IECEx: IEC 60079-0:2017 IEC 60079-11:2011 North America: UL 60079-11 (Edition 6) 2013 rev 2018 UL 60079-0 (Edition 7) 2019 rev 2020 CSA C22.2 NO 60079-11 (Edition 2) 2014 CSA C22.2 NO 60079-0 (Edition 4) 2019
Operating temperature range	In potentially explosive atmospheres: -40 °C to +60 °C (-40 to +140 °F) In other normal environments: -40 °C to +85 °C (-40 to +185 °F)
Operating frequencies	2400 MHz - 2483.5 MHz

Ordering Information

C108346.001	**BKV Connect 1 - Gateway (including 4 adapters)**
C108347.001	**BKV Connect 2 - Gateway in protective enclosure (without cable)**
C108347.010	**BKV Connect 2 NC - Gateway in protective enclosure NC (no cellular option) version (without cable)**
C108344.001	**BKV Collect 6 - Wireless sensor (with glue mount attached and nut adapter separate)**
C108345.001	**BKV Collect 6 Ex - Wireless sensor for hazardous areas (with glue mount attached and nut adapter separate)**
C108348.001	**AC-277 - Magnetic epoxy mount adapter**
C108349.001	**AC-370 - Glue mount adapter**
C108350.001	**AC-371 - Nut adapter**
C108393.001	**AC-375 - Wall mount for BKV Connect 1**

-	**BKV Ignite - Access to pre-configuration tool BKV Ignite**

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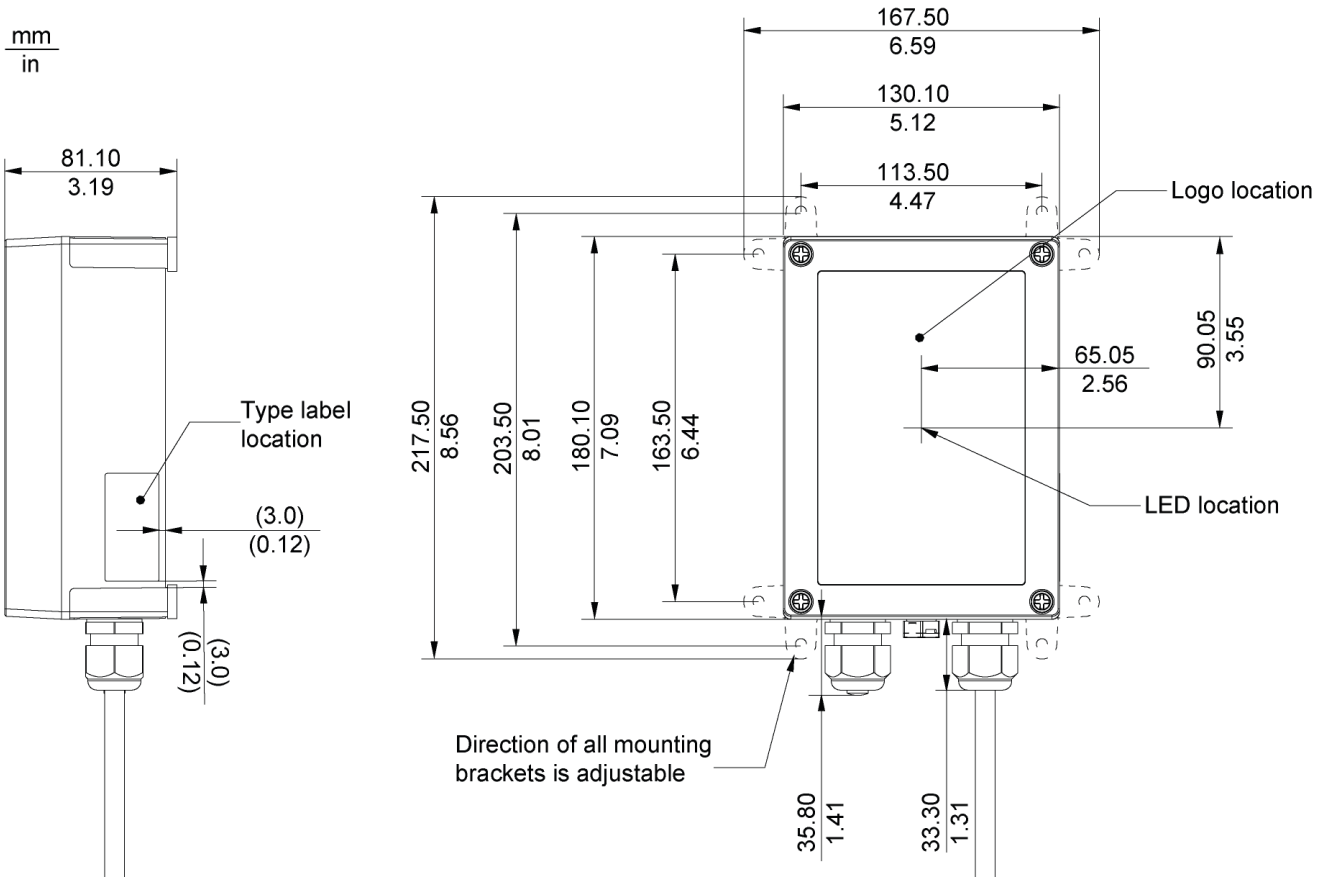
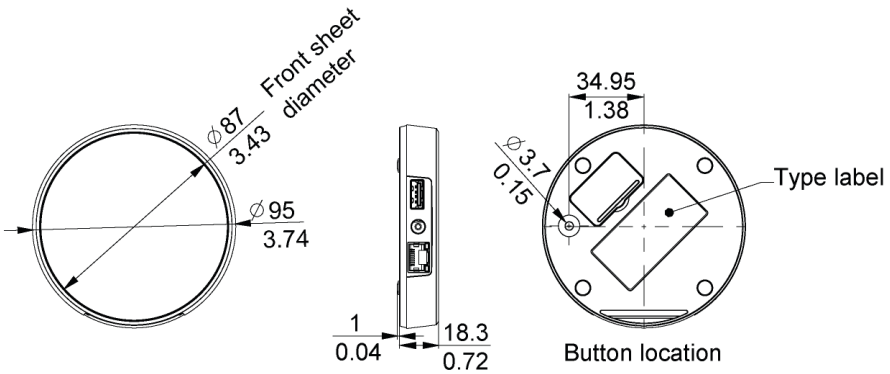
Dimensions

BKV Connect 2



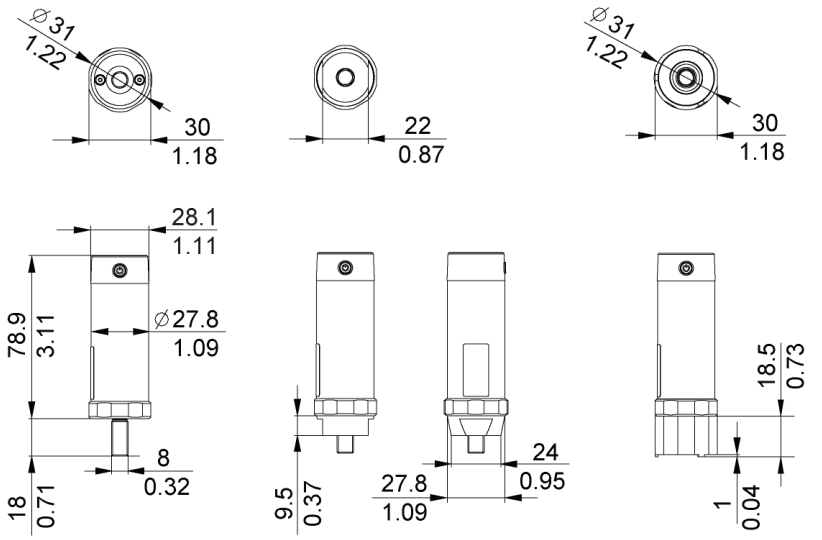
BKV Connect 1



Dimensions

BKV Collect 6 & 6 Ex

mm
in



Without adapter Nut adapter Glue mount adapter

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Subject to technical changes