IPS Beacon™ 2

Installation
Operation
Maintenance

Condition monitoring and alert system
for vibration and temperature

PCN = 87900088 04-20 (E). Original instructions.

These instructions must be read prior to installing, operating, using and maintaining this equipment.

Experience In Motion

CONTENTS

1 INTRODUCTION AND SAFETY

1.1 General

These instructions must always be kept close to the product's operating location or directly with the product.

Flowserve products are designed, developed and manufactured with state-of-the-art technologies in modern facilities. The unit is produced with great care and commitment to continuous quality control, utilizing sophisticated quality techniques, and safety requirements.

Flowserve is committed to continuous quality improvement and being at your service for any further information about the product in its installation and operation or about its support products, repair and diagnostic services.

These instructions are intended to facilitate familiarization with the product and its permitted use. Operating the product in compliance with these instructions is important to help ensure reliability in service and avoid risks. The instructions may not take into account local regulations; ensure such regulations are observed by all, including those installing the product. Always coordinate repair activity with operations personnel, and follow all plant safety requirements and applicable safety and health laws and regulations.

These instructions must be read prior to installing, operating, using and maintaining the equipment in any region worldwide. The equipment must not be put into service until all the conditions relating to safety, noted in the instructions, have been met. Failure to follow and apply the present user instructions is considered to be misuse. Personal injury, product damage, delay or failure caused by misuse are not covered by the Flowserve warranty.

1.2 CE Marking and approvals

It is a legal requirement that machinery and equipment put into service within certain regions of the world shall conform with the applicable CE Marking Directives covering Machinery and, where applicable, Low Voltage Equipment, Electromagnetic Compatibility (EMC), Pressure Equipment Directive (PED) and Equipment for Potentially Explosive Atmospheres (ATEX).

Where applicable, the Directives and any additional Approvals, cover important safety aspects relating to machinery and equipment and the satisfactory provision of technical documents and safety instructions. Where applicable this document incorporates information relevant to these Directives and Approvals.

To confirm the Approvals applying and if the product is CE marked, check the serial number plate markings and the Certification. (See Appendix: CERTIFICATION)

1.3 Disclaimer

Information in these User Instructions is believed to be complete and reliable. However, in spite of all of the efforts of Flowserve Corporation to provide comprehensive instructions, good engineering and safety practice should always be used.

Flowserve manufactures products to exacting International Quality Management System Standards as certified and audited by external Quality Assurance organizations. Genuine parts and accessories have been designed, tested and incorporated into the products to help ensure their continued product quality and performance in use. As Flowserve cannot test parts and accessories sourced from other vendors the incorrect incorporation of such parts and accessories may adversely affect the performance and safety features of the products. The failure to properly select, install or use authorized Flowserve parts and accessories is considered to be misuse. Damage or failure caused by misuse is not covered by the Flowserve warranty. In addition, any modification of Flowserve products or removal of original components may impair the safety of these products in their use.

1.4 Copyright

1.5 Duty conditions

This product has been selected to meet the specifications of your purchase order. The acknowledgement of these conditions has been sent separately to the Purchaser. A copy should be kept with these instructions.

The product must not be operated beyond the parameters specified for the application. If there is any doubt as to the suitability of the product for the application intended, contact Flowserve for advice.

If the conditions of service on your purchase order are going to be changed (for example liquid pumped, temperature or duty) it is requested that the user seeks the written agreement of Flowserve before start up.

1.6 Safety

1.6.1 Summary of safety markings

These User Instructions contain specific safety markings where non-observance of an instruction would cause hazards. The specific safety markings are:

DANGER This symbol indicates electrical safety instructions where non-compliance will involve a high risk to personal safety or the loss of life.

This symbol indicates safety instructions where non-compliance would affect personal safety and could result in loss of life.

This symbol indicates "hazardous and toxic fluid" safety instructions where non-compliance would affect personal safety and could result in loss of life.

CAUTION This symbol indicates safety instructions where non-compliance will involve some risk to safe operation and personal safety and would damage the equipment or property.

This symbol indicates explosive atmosphere zone marking according to ATEX. It is used in safety instructions where non-compliance in the hazardous area would cause the risk of an explosion.

This symbol is used in safety instructions to remind not to rub non-metallic surfaces with a dry cloth; ensure the cloth is damp. It is used in safety instructions where non-compliance in the hazardous area would cause the risk of an explosion.

Note: This sign is not a safety symbol but indicates an important instruction in the assembly process.

1.6.2 Personnel qualification and training

All personnel involved in the operation, installation, inspection and maintenance of the unit must be qualified to carry out the work involved. If the personnel in question do not already possess the necessary knowledge and skill, appropriate training and instruction must be provided. If required, the operator may commission the manufacturer/supplier to provide applicable training.

Always coordinate repair activity with operations and health and safety personnel, and follow all plant safety requirements and applicable safety and health laws and regulations.

1.6.3 Safety action

This is a summary of conditions and actions to help prevent injury to personnel and damage to the environment and to equipment. For products used in potentially explosive atmospheres section 1.6.4 also applies.

DANGER NEVER DO MAINTENANCE WORK WHEN THE UNIT IS CONNECTED TO POWER (Lock out.)

HANDLING COMPONENTS

Many precision parts have sharp corners and the wearing of appropriate safety gloves and equipment is required when handling these components. To lift heavy pieces above 25 kg (55 lb.) use a crane appropriate for the mass and in accordance with current local regulations.

1.6.4 Products used in potentially explosive atmospheres

Measures are required to:

- Avoid excess temperature
- Prevent buildup of explosive mixtures
- Prevent the generation of sparks

If a charge-generating mechanism is present, an incendive level of charge could migrate to these metal parts and subsequently discharge to earthed metal. Precautions are required to ensure that a charge-generating mechanism is unlikely to be present and/or discharge to earthed metal is improbable.

1.7 Specific machine performance

For performance parameters see section 1.5 *Duty conditions*. Where performance data has been supplied separately to the purchaser these should be obtained and retained with these User Instructions if required.

2 TRANSPORT AND STORAGE

Make sure that hazardous substances are disposed of safely and that the correct personal protective equipment is used. The safety specifications must be in accordance with the current local regulations at all times.

2.1 Consignment receipt and unpacking

Immediately after receipt of the equipment it must be checked against the delivery/shipping documents for its completeness and that there has been no damage in transportation. Any shortage and/or damage must be reported immediately to Flowserve and must be received in writing within ten days of receipt of the equipment. Later claims cannot be accepted.

Check any crate, boxes or wrappings for any accessories or spare parts that may be packed separately with the equipment or attached to side walls of the box or equipment.

Each product has a unique serial number. Check that this number corresponds with that advised and always quote this number in correspondence as well as when ordering spare parts or further accessories.

2.2 Handling

Boxes, crates, pallets or cartons may be unloaded using fork lift vehicles or slings dependent on their size and construction.

2.3 Storage

CAUTION Store the equipment in a clean, dry location away from vibration. Leave protective covers in place to keep dirt and other foreign material out of casing.

2.3.1 Storage and packaging

Normal packaging is designed to protect the unit and parts during shipment and for dry, indoor storage.

After unpacking, protection will be the responsibility of the user.

2.4 Recycling and end of product life

At the end of the service life of the product or its parts, the relevant materials and parts should be recycled or disposed of using an environmentally acceptable method and in accordance with local regulations. If the product contains substances that are harmful to the environment, these should be removed and disposed of in accordance with current local regulations.

2.5 Disposal Instructions

At the end of the product's life, do not dispose of any electronic component or instrument in the domestic waste. Disposal should be done in accordance with applicable regulations, which vary from state to state and country to country. The IPS Beacon 2 unit includes a built-in battery and should be disposed of in accordance with applicable battery disposal regulations. Batteries should not be incinerated, unless suitable procedures are followed and qualified handlers have taken appropriate precautions. Exposure of these cells to high temperatures or fire can cause the cells to vent and/or rupture. These cells do not contain dangerous substances. The reaction products are inorganic and do not represent environmental hazards, once the decomposition or neutralization process has terminated.

Disposal in Europe

Batteries for disposal should not be transported by air. For road transport of dangerous goods ADR special provision 636 and packing instruction 903a apply.

Disposal in US

Hazardous waste of spent batteries can be disposed after they are first neutralized through an approved secondary treatment prior to disposal. Disposal of spent batteries should be performed by authorized, professional disposal company, which has the knowledge in the requirements of the Federal, the State and the Local authorities regarding hazardous materials, transportation and waste disposal. In any case it is recommended to contact the local EPA office.

3 DESCRIPTION

The IPS Beacon 2 is a cost effective means of measuring the basic health of equipment. It is designed to quickly convey the health of any equipment it is attached to, based on vibration and temperature measurements. It also acts to record the amount of time the equipment has been running.

The IPS Beacon 2 is a battery powered unit that offers the ability to measure 3-axis vibration, temperature and runtime of any equipment it is attached to. The IPS Beacon 2 is completely encapsulated including battery, electronics and sensor packaged inside a polycarbonate enclosure. The IPS Beacon 2 also provides three LED indicator lights for a quick visualization of equipment health.

3.1 Configurations

Base IPS Beacon 2 unit is provided with preset factory set points. Each unit also offers optional upgrades to allow for data logging [see Section 3.5], data downloads to a PC format and unit configuration.

The IPS Beacon 2 offers the ability to program alarm levels for each of the vibration axes (see Figure 2: X-Y-Z axis orientation) temperature and runtime values. If those alarm levels are exceeded, the IPS Beacon 2 will provide a visual indication using the LED indicator lights and also log the last alarm value for each of the data parameters.

The runtime value for the IPS Beacon 2 is calculated by summing the number of readings the IPS Beacon 2 takes where the Y-axis vibration is above the runtime vibration threshold. Once the runtime value exceeds the customer enabled runtime threshold, the IPS Beacon 2 yellow LED will begin to flash to indicate a runtime alarm.

3.1.1 Factory preset alarm settings

The IPS Beacon 2 comes pre-programmed with the following default settings for the user-configurable options:

Table 1: IPS Beacon 2 factory default settings

Parameter	Default setting (metric units)	Default setting (US units)
X-axis vibration alarm level	9.4 mm/s	0.38 in./sec
Y-axis vibration alarm level	9.4 mm/s	0.38 in./sec
Z-axis vibration alarm level	9.4 mm/s	0.38 in./sec
Temperature alarm level	85 °C	185 °F
Runtime vibration threshold	2.5 mm/s	0.1 in./sec
Runtime alarm level	0 hours (disabled)*	
Vibration readings type	RMS	
Data log interval	5 minutes	
Average number of readings for alarm limit	2 readings	

*Note: End-user defined based on operating conditions (i.e. bearing type, oil type, operating temperature)

See section 5, *Custom configuration programming*, to change any of the above settings.

3.2 Alarm & runtime alert modes

By default, the IPS Beacon 2 enters alarm mode when the average of two readings, of either vibration or temperature, exceed the predefined alarm limits. Alarm mode is indicated with a flashing red light. The user should do a physical detailed analysis of the equipment being monitored when the alarm is activated.

The IPS Beacon 2 can enter runtime alert mode when the runtime value of the equipment is above the runtime threshold (based on number of Y-axis data readings above the runtime vibration threshold). Runtime alert mode is indicated with a flashing yellow light. See Table 2.

Table 2: LED indicator lights description with PUM installed

LED	State	Description
GREEN	3 quick flashes	Indicates that IPS Beacon 2 has been powered on with PUM
GREEN	Flash every 5 seconds	Normal operation – vibration and temperature are within acceptable limits
RED	Flash every 5 seconds	Current alarm – one of the measurements has exceeded its alarm limit and has not returned within the acceptable range
RED & GREEN	Flash every 5 seconds	Alarm – one of the measurements previously exceeded its alarm limit, but has now returned within the acceptable range
GREEN & YELLOW	Flash every 5 seconds	Runtime (Service) Alert - Vibration and temperature are within acceptable limits, but the runtime value has exceeded its alert limit.
RED & YELLOW	Flash every 5 seconds	Current Alarm and Runtime (Service) Alert - one or more of the measurements is currently exceeding its alarm limits and the runtime value has exceeded its alert limit.
GREEN, RED & YELLOW	Green and Red LEDs flash and 5 seconds later Yellow LED flashes	Past Alarm and Runtime (Service) Alert - one or more of the measurements previously exceeded its alarm limits, but has now returned to the acceptable range, and the runtime value has exceeded its alert limit

3.3 Performance and operation limits

This product has been selected to meet the specification of your purchase order.

The following data is included as additional information to help with your installation. This is typical information and if required, a definitive statement for your application can be obtained from Flowserve.

3.3.1 IPS Beacon 2 nomenclature

Table 3: IPS Beacon 2 nomenclature

Flowserve item code	Generic designation	Specifications	Material
9050	Model VB-107	IPS Beacon 2 compact monitor	Polycarbonate
	Fastener	M6 (¼ - 28) 41 mm (1-5/8 Inch)	18-8

CAUTION This product must not be operated beyond the parameters specified for the application. If there is any doubt as to the suitability of the product for the application intended, contact the manufacturer for advice.

CAUTION IPS Beacon 2 material compatibility is the responsibility of the end user.

3.3.2 Sensor specifications

Table 4: IPS Beacon 2 and sensor specifications

IPS Beacon 2 components	
Channels (internal)	1-battery voltage, 1-onboard temperature, 3-vibration (X, Y, Z), 1-runtime
Measurement rates	1 to 60 minutes
Ambient temperature	-40 °C (-40 °F) to +85 °C (185 °F)
Power requirement	3.6 VDC internal battery pack
Outer shell	Polycarbonate with Borosilicate glass lens and 316SS base
Mounting	M6 (¼ x 28) stud mount
IPS Beacon 2 sensor components	
Variable	**Limit**
Vibration (velocity)	Tri axis 0-25 mm/s (0 – 1 IPS) peak or RMS. Accuracy +/- 10 % full scale
Vibration Frequency Measurement Range	Fmin 6 Hz – Fmax 1000 Hz
Surface temperature (T_s) measurement range	-40 °C (-40 °F) ≤ T_s ≤ +93.33 °C (200 °F) - Accuracy +/-2.8 °C (5 °F)
IPS Beacon 2 operational state	**Battery life**
Normal operating and environmental conditions	4 years with 5-minute sampling

Note: Measurement accuracy for surface temperature (range -40 to 93.33 °C) and vibration (range 0 to 25 mm/s) is absolute accuracy of the measurement relative to a known, calibrated device. Values shown represent the expected performance operating under steady state conditions at 23 °C (73 °F) with no external interferences.
Note: The IPS Beacon 2 temperature measurement is optimized for surface temperature readings of an operating bearing housing.

3.3.3 Battery

CAUTION ***The IPS Beacon 2 battery is not replaceable.***

You must replace the entire unit once the battery runs out of power. The battery life is not covered as part of the standard device warranty (See Table which shows the average battery life under normal and alarm mode operating conditions.)

3.4 Power-up module (PUM)

The Power-up module (PUM) must be attached to the IPS Beacon 2 to turn on the unit. When disconnected from the IPS Beacon 2, the unit remains off and does not take any sensor readings.

Note: The PUM provides on/off functionality only

Note: The IPS Beacon 2 PUM is compatible with the IPS Beacon 2 only, do not attempt to use with other IPS Beacon models

3.5 IPS Bluetooth Module

The optional IPS Bluetooth Module powers-up the IPS Beacon 2 unit, communicates via Bluetooth® radio, is used to configure the IPS Beacon 2, and downloads sensor data from the unit. When connected to the IPS Beacon 2 unit the Bluetooth Module will log the sensor data as it is recorded on every log interval:

- Date & time
- X-axis vibration
- Y-axis vibration
- Z-axis vibration
- Temperature
- Runtime value

In addition, the IPS Bluetooth Module will record the IPS Beacon 2 serial number, firmware version number and runtime settings (runtime threshold and runtime vibration threshold) for each IPS Beacon 2 connected.

The IPS Bluetooth Module has enough built-in memory to capture approximately 90 days of runtime data at a read rate of 5 minutes.

See Section 5, *Custom configuration programming*, to adjust the data logging/ read interval for the IPS Beacon 2.

Note: The IPS Beacon 2 Bluetooth Module is compatible with the IPS Beacon 2 only, do not attempt to use with other IPS Beacon models.

Note: Bluetooth Modules should be replaced when the voltage reading gets down to range of 2.8V to 3.0V.

Note: The *Bluetooth*® word mark and logos are registered trademarks owned by the Bluetooth SIG, Inc. and any use of such marks by Flowserve Corp is under license. Other trademarks and trade names are those of their respective owners.

4 MAINTENANCE

Warning: Do not open unit.

CAUTION ***Warning: battery pack is not replaceable. Do not attempt to replace.***

Power is provided by a lithium battery pack, located in the IPS Beacon 2 housing. Battery life depends upon measurement intervals.

4.1 Tools required

A typical range of tools that will be required to maintain the IPS Beacon 2 is listed below:

- PC computer with USB adapter
- DockTalk software utility
- IPS Dock (VB-101-DOCK)
- Hand wrenches
- Phillips-head screwdriver

Note: If the IPS Bluetooth Module is being used, the IPS Dock and DockTalk utility is not required.

4.2 Turning unit on/off

The IPS Beacon 2 is shipped in the off position and you will be required to remove protective tape and the spacer that keeps the PUM in the off position. Discard the tape and spacer and follow the power up procedure below.

To power up the IPS Beacon 2, simply install the PUM to the DB9 on the side of the unit and insert the screw into the PUM (tighten screw to 0.7 Nm (6 in.•lb.) torque to keep PUM tightly fastened to IPS Beacon 2).

The green LED will flash 3 times in succession to confirm power-up. This will activate sensor readings and alarm indications at the pre-configured levels.

To power off the IPS Beacon 2 remove the power-up module (PUM) from the DB9 on the side of the unit. This will stop any sensor readings. The red LED will flash 3 times in succession to confirm the power is off.

Note: The IPS Bluetooth TAM can also be used to turn the IPS Beacon 2 on or off in place of the PUM.

4.3 Low battery

The battery pack is NOT replaceable. Low batteries can only be remedied by replacing the entire IPS Beacon 2 unit.

Power is provided by a non-replaceable battery pack, located in the inner portion of the unit. Battery life is typically 4 years, dependent on data reading interval. Battery voltage should normally be between 2.8 and 3.6 VDC. If it is lower than this, the entire IPS Beacon 2 unit will need to be replaced.

5 CUSTOM CONFIGURATION PROGRAMMING

Note: This section is only applicable when the IPS Dock or IPS Mobile Insight app is used to customize the IPS Beacon 2 away from standard factory setting and / or to enable the runtime feature.

CAUTION ***Warning:*** Errors in programming can render the IPS Beacon 2 unit inoperable; proceed with caution. Flowserve is not liable for any damage caused by programming errors.

In order to perform any of the functions described in this section, you will first need to connect to the IPS Beacon 2 unit using the hardware or software configuration utilities as described below in section

5.2 Connecting to IPS Beacon 2 unit.

5.1 User configurable settings

The IPS Beacon 2 provides certain settings that can be configured by the user. These parameters are listed in table 5 below **(These settings are valid unless otherwise specified by documentation from a Flowserve Factory):**

Table 5: IPS Beacon 2 user configurable settings

Parameter	Default units	Description
X-axis vibration alarm level	mm/s (in./sec)	X-axis vibration level above which IPS Beacon 2 will register an alarm (Factory Default: Enabled)
Y-axis vibration alarm level	mm/s (in./sec)	Y-axis vibration level above which IPS Beacon 2 will register an alarm (Factory Default: Enabled)
Z-axis vibration alarm level	mm/s (in./sec)	Z-axis vibration level above which IPS Beacon 2 will register an alarm (Factory Default: Enabled)
Temperature alarm level	°C (°F)	Temperature level above which IPS Beacon 2 will register an alarm (Factory Default: Enabled)
Readings/ average	-	Number of readings averaged for alarm limit comparison
Runtime vibration threshold	mm/s (in./sec)	The value the Y-axis vibration must be above in order to record the equipment as running. (Factory Default: 0)
Runtime threshold	hours	The amount of time for which the equipment must be recorded as running above which the IPS Beacon 2 will register a runtime alert. (Factory Default: Disabled)
Alarm reset hours	hours	The number of hours for which the IPS Beacon 2 will indicate a past alarm.
Data read interval	Seconds	How often IPS Beacon 2 reads sensor data
Log Interval	Minutes	How often IPS Beacon 2 logs sensor data

5.2 Connecting to IPS Beacon 2 unit

To connect to the IPS Beacon 2, the user must have a mobile device loaded with the IPS Mobile Insight app or a PC loaded with the IPS DockTalk software along with an IPS Dock:

Required hardware:	Apple / Android Mobile Device (iOS version 10 or higher / Android 4.3 or higher) or the IPS Dock
Required software utility:	IPS Mobile Insight app or IPS DockTalk

5.3 Setting alarm set points

The IPS Beacon 2 unit can have high alarm levels programmed for each data parameter. When the alarm level threshold is exceeded for any data parameter, the IPS Beacon 2 unit will flash the red LED indicator light.

The IPS Beacon 2 can also have the runtime alert level along with the runtime vibration threshold (the value the Y-axis vibration must be above in order to record the equipment as being running) custom programmed. When the Y-axis vibration is above the runtime vibration threshold, the runtime value is incremented. When the runtime value is above the runtime threshold a runtime alert is triggered and the yellow LED indicator light will flash. (See *Table 2: LED indicator lights description* with PUM installed, for more detail.)

To program alarms the user can utlize the optional Bluetooth Module or utlize the IPS Dock and DockTalk software- refer to Dock IOM (PCN 26999975)

5.4 Resetting the runtime value

The runtime value on the IPS Beacon 2 can be reset (to zero) by taking the IPS Beacon 2 unit to the IPS Dock and resetting the parameter through the IPS DockTalk software or though the IPS Mobile Insight app.

5.5 Setting time and date on IPS Beacon 2 unit

The date and time on the IPS Beacon 2 unit can be synchronized when connected to the IPS Dock and DockTalk software or IPS Mobile Insight app to assure accurate time stamps.

For details, refer to the Dock IOM (PCN 26999975) or the IPS Mobile Insight app.

5.6 Reloading factory configuration

To reload the original factory configuration into the IPS Beacon 2 unit you will need a copy of the original CSV configuration file or through the IPS Mobile Insight app for your particular unit. This is available when saved into a CSV file when the unit is new (through the DockTalk utility) or you may contact the Flowserve factory to obtain a copy of this file.

For details, refer to the DockTalk IOM (PCN 26999975).

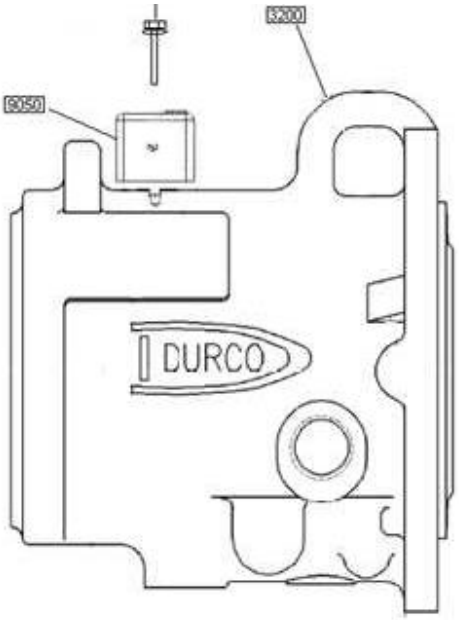


Figure 1: Example drawing of IPS Beacon 2 installation on a Durco pump

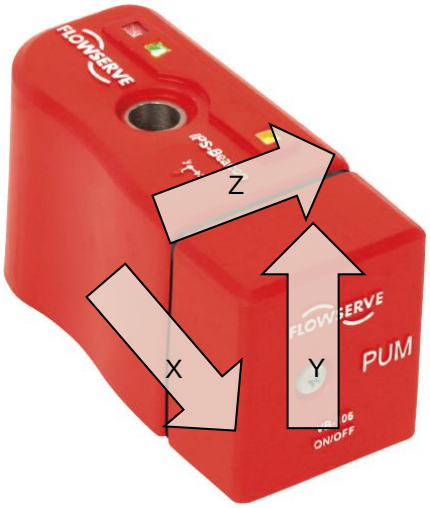
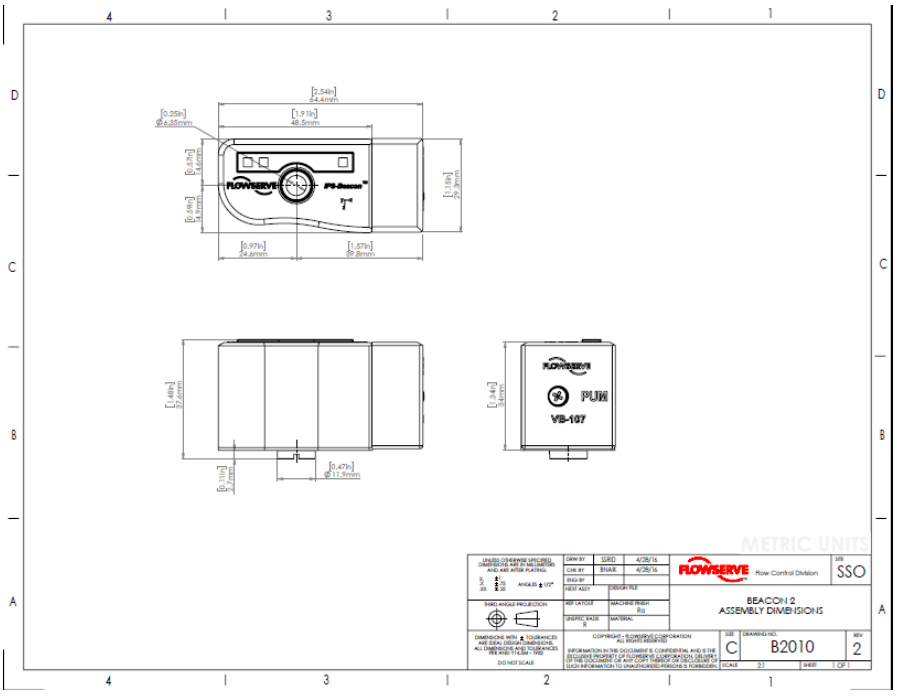
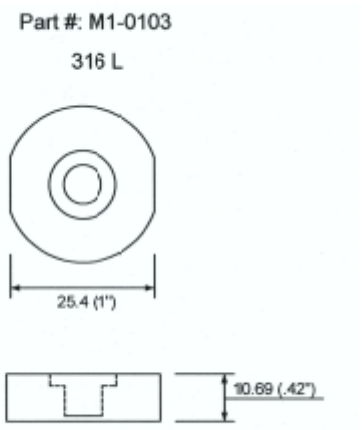


Figure 2: X-Y-Z axis orientation

Figure 3: IPS Beacon 2 drawing





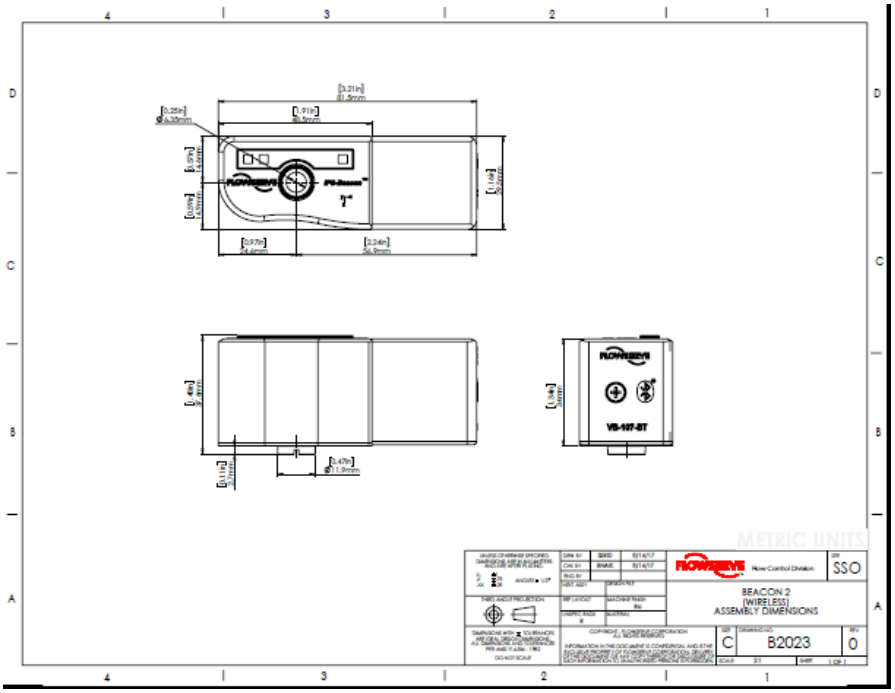


Figure 4: IPS Beacon 2 mounting pad

6 INSTALLATION

CAUTION ***Always wear protective gloves as pump and IPS Beacon 2 can be hot.***

6.1 Tools required

- Allen-head set
- Phillips-head screwdriver, set at 0.7 Nm (6 in.•lb) torque.

6.2 Unpacking

Note: This section is only applicable if the IPS Beacon 2 has not already been installed on a pump by the factory.

Carefully open package received from factory and remove protective wrapping from IPS Beacon 2 unit and accessories. Inspect all hardware for damage. Report any damage to shipping carrier immediately.

Ensure you have received the correct units and accessories for your application. Cross-check hardware received versus packing slip and purchase order.

Record unit serial numbers for future reference.

6.3 Preliminary operational check

After unpacking and before installation, perform the following operational check on the unit:

1. Remove the protective tape
2. Remove the pre-attached PUM and spacer from the IPS Beacon 2 unit.
3. Re-attach the PUM to the DB9 port which turns on the IPS Beacon 2 unit.
4. Confirm the green LED light blinks 3 times to signify power-on

Note: 3 single and 3 double flashes for the Bluetooth Module to signify power-on

.

In case of issues with powering up the unit, refer to Section
9 Trouble-Shooting Guide.

6.4 Attachment options

The IPS Beacon 2 is designed to be mounted in a horizontal position to the equipment being monitored. This will allow for correct classification of the 3 axes on the vibration sensor, which is especially important if the alarm limits are set to different values on each axis. (See Figure 2: X-Y-Z axis orientation)

The IPS Beacon 2 can be attached to equipment with a M6 (¼ in.-28) stud, with the IPS Beacon 2 placed so the stud comes through the mounting hole in the center of the unit. Also, on equipment with an M6 (¼ in.-28) threaded tap, the IPS Beacon 2 can be placed over this tap and a 6 mm (¼ in.) stud inserted through the IPS Beacon 2 and threaded into the tap. Attach IPS Beacon 2 [9050] to bearing housing [3200] using Phillips-head fastener (M6 or ¼ in. x 28 18-8SS stud). The length of the stud needs to be (M6 x 41 mm) or (1/4-inch x 1 5/8-inch). An alternative is to attach the IPS Beacon 2 to the mounting pad using the hex head fastener and then epoxy the mounting pad to the housing surface. (See Figure 5.)

Tighten the hex head screw with a Phillips head screwdriver to 0.7 Nm (6 in.•lb) torque.

6.5 LED Indications

The IPS Beacon 2 has three LED indicator lights to signify various states. See table below for description of each state.

Table 6: LED indicator lights state description

LED	State	Description
GREEN	3 quick flashes	Indicates that IPS Beacon 2 has been powered on with PUM
RED	3 quick flashes	Indicates that IPS Beacon 2 has been powered off with PUM
GREEN	Flash every 5 seconds	Normal operation – vibration and temperature are within acceptable limits
RED	Flash every 5 seconds	Current alarm – one of the measurements has exceeded its alarm limit and has not returned within the acceptable range
RED & GREEN	Flash every 5 seconds	Alarm – one of the measurements previously exceeded its alarm limit, but has now returned within the acceptable range
GREEN & YELLOW	Flash every 5 seconds	Runtime Alert - Vibration and temperature are within acceptable limits, but the runtime value has exceeded its alert limit.
RED & YELLOW	Flash every 5 seconds	Current Alarm and Maintenance Alert - one or more of the measurements is currently exceeding its alarm limits and the runtime value has exceeded its alert limit.
GREEN, RED & YELLOW	Green and Red LEDs flash and 5 seconds later Yellow LED flashes	Past Alarm and Maintenance Alert - one or more of the measurements previously exceeded its alarm limits, but has now returned to the acceptable range, and the runtime value has exceeded its alert limit
RED	Flash every 1 second	Low battery – replace IPS Beacon 2
RED	Solid	Battery is completely depleted – replace IPS Beacon 2

7 ACTIVATE THE IPS-BEACON 2

CAUTION Never heat the IPS Beacon 2 to temperatures in excess of 121 ºC (250 ºF). Heating past this temperature could result in mechanical failure.

CAUTION Always wear protective gloves as pump and IPS Beacon 2 can be hot.

7.1 Power-up module (PUM)

The power-up module (PUM) has protective tape and an insert which must be removed before activation: remove the tape and screw attaching the PUM to the IPS Beacon 2. Next remove the PUM and the spacer between it and the IPS Beacon 2.

When disconnected from the IPS Beacon 2, the unit remains off and does not take any sensor readings.

To power up the IPS Beacon 2 unit attach the PUM to the DB9 port on the end of the IPS Beacon 2 and insert the screw into the PUM (tighten screw to 0.7 Nm (6 in.•lb) keep PUM tightly fastened to IPS Beacon 2. Verify the green LED on the IPS Beacon 2 flashes 3 times in quick succession to signify the unit is turned on.

7.2 IPS Bluetooth Module

The optional IPS Bluetooth Module powers-up the IPS Beacon 2 unit, stores data, connects via Bluetooth connectivity to the IPS Mobile Insight app. When connected to the IPS Beacon 2 unit the IPS Bluetooth Module will log the sensor data as it is recorded on predefined interval.

To attach the IPS Bluetooth Module, simply remove the power-up module (PUM) from the IPS Beacon 2 (if attached) and plug in the IPS Bluetooth Module to the DB9 port on the IPS Beacon 2. Once attached, wait for 6 LED light flashes from the IPS Beacon 2 (the first 3 flashes will be single flashes while the last 3 will be double-flashes) which signals that the IPS Bluetooth Module has downloaded the current sensor data and last alarm values from the IPS Beacon 2. The IPS Bluetooth Module can now be disconnected from the IPS Beacon 2, as long as the PUM is replaced, or left attached to continuously log each set of sensor data readings.

The IPS Bluetooth Module has enough built-in memory to capture approximately 29,900 sensor data readings. Depending on how often the IPS Beacon 2 unit is set to log data, the amount of time varies for which the IPS Bluetooth Module can capture sensor readings. See section 5, *Custom configuration programming*, to adjust the data logging interval for the IPS Beacon 2.

8 PARTS LIST AND DRAWINGS

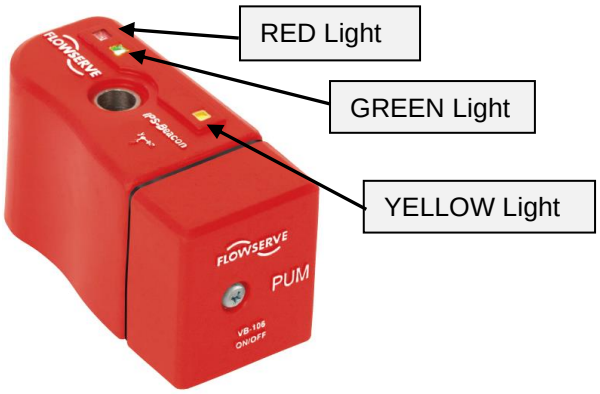


Figure 5: IPS Beacon 2 LED lights

Table 7: IPS Beacon 2 parts and accessories list

Model	Description
VB-107	IPS Beacon 2
VB-107-BT	Bluetooth Module provides Bluetooth radio connectivity and log-in sensor data on IPS Beacon 2 unit
VB-107 mounting kit	Mounting pad and bolt to attach IPS Beacon 2 to a threaded tap
VB-107 screw	Cap screw to attach PUM to IPS Beacon 2
VB-107 screw-BM	Cap screw to attach Bluetooth Module to IPS Beacon 2
VB-101 Dock	Programming dock to connect IPS Beacon 2 to PC and change configuration settings
DockTalk	Configuration software utility

9 TROUBLE-SHOOTING GUIDE

In the event you encounter trouble with your unit:

9.1 No flashing LEDs

There may be no flashing LEDs on the IPS Beacon 2 unit for several reasons:

- Unit not powered up
- Unit not configured correctly

See solutions below to each of the possible causes.

Unit not powered up

1. Verify the power-up module (PUM) or Bluetooth Module is fully engaged in the DB9 port (and screw tightened to the proper torque) of the IPS Beacon 2 unit. (See section 4, *Maintenance*, on how to turn on the unit).

   Note: If the problem is not solved and the

optional IPS Dock and DockTalk software has been purchased, go to Step 2.
2. Take the IPS Beacon 2 unit to a safe area and connect to the IPS Dock and use the DockTalk software utility as described in section 5.2. If you cannot connect to the IPS Beacon 2 unit, contact Flowserve factory for additional support. (See section 10.2.)
3. Refer to Dock IOM (PCN 26999975) for instructions on how to read the battery level. If it is above 2.8 V skip to *Unit not configured correctly* section below. If the level is below 2.8 V, the IPS Beacon 2 unit will need to be replaced.

Unit not configured correctly
1. Refer to Dock IOM (PCN 26999975) or Section 5 for instructions on how to reload factory settings into the IPS Beacon 2.

9.2 Inaccurate or missing data

For users that have the IPS Dock and the data being read from the IPS Beacon 2 unit is either inaccurate or missing, this could be due to an incorrect configuration of the unit or improper installation (looseness).

Unit configuration incorrect
If the inaccurate/missing data problem is across all sensor data parameters, reload the original configuration for the IPS Beacon 2 unit. (See Section 5, *Custom configuration programming*.)

Improper installation
Confirm IPS Beacon 2 is securely attached to equipment being monitored.

If none of the above solutions are successful, contact local sales personnel or the factory for additional support.

Unit manufactured by:
Flowserve Corporation
10920 W. Sam Houston Parkway N., Suite 950
Houston, TX 77064, USA
Phone: +1-832-375-0807

APPENDIX: CERTIFICATION

The following certifications are applicable to the IPS Beacon 2:

Model VB-107 certifications

Flowserve **Houston, TX 77064 USA**		**Model: VB-107 Beacon**	
CE 0518	Ex II 1 GD		c PS us CERTIFIED ELECTRICAL SAFETY LR1434-1
IECEx CML 16.0018X **CML 16ATEX2024X** **Ex ia IIC T4 Ga** **Ex ia IIIC T135°C Da** **-40°C ≤ Ta ≤ +85°C**		**Cl I, Division 1, Grps A,B,C,D;T4** **Cl II, Division 1, Grps E, F, G;T135°C** **Cl I, Zone 0, AEx ia IIC T4 Ga** **Zone 20, AEx ia IIIC T135°C Da** **Ex ia IIC T4 Ga** **Ex ia IIIC T135°C Da** **Electrical Ratings: 4.0Vdc, 87mA** **-40°C ≤ Ta ≤ +85°C** **INTRINSICALLY SAFE** **SÉCURITÉ INTRINSÈQUE**	
WARNING:		**WIPE ONLY WITH DAMP CLOTH DUE TO ELECTROSTATIC DISCHARGE HAZARD.**	
ADVERTISSEMENT:		**ESSUYER AVEC UN CHIFFON HUMIDE EN RAISON DE RISQUES DE DÉCHARGES ÉLECTROSTATIQUES**	
Flowserve			
Houston, TX 77064 US A		**Model: VB-107 BT**	
CE 0518	Ex II 1GD		
Part of: **IECEx CML 16.0018X** **CML 16ATEX2024X**			

CAUTION This product must not be operated beyond the parameters specified for the application. If there is any doubt as to the suitability of the product for the application intended, contact the manufacturer for advice.

The battery pack is **NOT** re-chargeable or replaceable. Low batteries can only be remedied by replacing the entire unit.

WARNING STATIC HAZARD: Wipe only with a damp cloth due to electrostatic discharge hazard.

If a charge-generating mechanism is present, an incendive level of charge could migrate to these metal parts and subsequently discharge to earthed metal. Precautions are required to ensure that a charge-generating mechanism is unlikely to be present and/or discharge to earthed metal is improbable.

Note: **The substitution of components may impair intrinsic safety.**

10 DECLARATION OF CONFORMITY

Note: The following is a “typical” IPS Beacon 2 Declaration of Conformance.

Declaration of Conformity

We, Flowserve Corporation
10920 West Sam Houston Parkway North
Suite 950
Houston, Texas 77064
USA

Declare in sole responsibility that the equipment:

VB-107 Beacon
SB-107 Beacon
VB-107 BT
SB-107 BT

Including all options and versions of the base model numbers to which this Declaration refers are in compliance with the Directives and Norms specified herein.

1.1 ATEX Directive 94/9/EC + all amendments

Basis for compliance:

The equipment has been assessed using the following standards and is supported by the following technical documents:

EN 60079-0	2012	Explosive atmospheres- Part 0: Equipment- General Requirements
EN 60079-11	2012	Explosive Atmospheres-Part 11: Equipment Protection by intrinsic safety “i”
EN 60079-26	2006	Explosive atmospheres-Part 26: Equipment with equipment protection level (EPL) Ga

Certificate Number: CML 16ATEX2024X
Notified Body: Certification Management Limited
Markings:

Flowserve
Houston, TX 77064 USA **Model: VB-107 Beacon**
CE 0518 Ex II 1GD SP US Ex ia

IECEx CML 16.0018X
CML 16ATEX2024X
Ex ia IIC T4 Ga
Ex ia IIIC T135°C Da
-40°C ≤ Ta ≤ +85°C

Cl I, Division 1, Grps A, B, C, D; T4
Cl II, Division 1, Grps E, F, G; T135°C
Cl I, Zone 0, AEx ia IIC T4 Ga
Cl I, Zone 20, AEx ia IIIC T135°C Da
Electrical Ratings: 4.0 Vdc, 87mA
-40°C ≤ Ta ≤ +85°C
“INTRINSICALLY SAFE”
“SÉCURITÉ INTRINSÈQUE”

WARNING: WIPE ONLY WITH DAMP CLOTH DUE TO ELECTROSTATIC DISCHARGE HAZARD
ADVERTISSEMENT: ESSUYER AVEC UN CHIFFON HUMIDE EN RAISON DE RISQUES DE DÉCHARGES ÉLECTROSTATIQUES

Page **1** of **2** **SF-044 C**

Flowserve
Houston, TX 77064 USA **Model: SB-107**

CE 0518 Ex II 1GD CSA C US Ex ia

IECEx CML 16.0018X	Cl I, Division 1, Grps A, B, C, D; T4
CML 16ATEX2024X	Cl II, Division 1, Grps E, F, G; T135°C
Ex ia IIC T4 Ga	Cl I, Zone 0, AEx ia IIC T4 Ga
Ex ia IIIC T135°C Da	Cl I, Zone 20, AEx ia IIIC T135°C Da
-40°C ≤ Ta ≤ +85°C	Electrical Ratings: 4.0 Vdc, 87mA
	-40°C ≤ Ta ≤ +85°C
	"INTRINSICALLY SAFE"
	"SÉCURITÉ INTRINSÈQUE"

WARNING: WIPE ONLY WITH DAMP CLOTH DUE TO ELECTROSTATIC DISCHARGE HAZARD
ADVERTISSEMENT: ESSUYER AVEC UN CHIFFON HUMIDE EN RAISON DE RISQUES DE DÉCHARGES ÉLECTROSTATIQUES

Flowserve
Houston, TX 77064 USA **Model: VB-107 BT**

CE 0518 Ex II 1GD

Part of:
IECEx CML 16.0018X
CML 16ATEX2024X

Flowserve
Houston, TX 77064 USA **Model: SB-107 BT**

CE 0518 Ex II 1GD

Part of:
IECEx CML 16.0018X
CML 16ATEX2024X

The technical documentation required to demonstrate that the product meets the requirements of the Directives has been compiled by the signatory below and is available for inspection by the relevant enforcement authorities.

Signed: _____ Date: _____
Authorized Person, Rick Lawson
General Manager

OR

Signed: _____ Date: _____
Authorized Person, Cody Lawson
Production/ Quality Manager

Your Flowserve factory contacts:

Flowserve Corporation
10920 W Sam Houston Parkway N, Suite 950
Houston, TX 77064 USA
Phone: +1 832 375 0807

Your Flowserve sales contact:

Go to: www.flowserve.com
Equipment Monitoring and Control Products

FLOWSERVE REGIONAL SALES OFFICES:

USA and Canada
Flowserve Corporation
5215 North O'Connor Blvd.,
Suite 2300
Irving, Texas 75039-5421 USA
Telephone 1 972 443 6500
Fax 1 972 443 6800

Europe, Middle East, Africa
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Flowserve Corporation
6840 Wynnwood Lane
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Fax 1 713 803 4497

Asia Pacific
Flowserve Pte. Ltd
10 Tuas Loop
Singapore 637345
Telephone 65 6771 1600
Fax 65 6862 2329

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