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1 Introduction and Safety

1.1 Introduction

Purpose of this manual

The purpose of this manual is to provide necessary information for:

- Installation
- Operation
- Maintenance

CAUTION:
Failure to observe the instructions contained in this manual could result in personal injury and/or property damage, and may void the warranty. Read this manual carefully before installing and using the product.

NOTICE:
Save this manual for future reference and keep it readily available.

1.2 Inspect the package

1. Inspect the package for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. File a claim with the shipping company if anything is out of order.
   If the product has been picked up at a distributor, make a claim directly to the distributor.

1.3 Limited warranty

ITT Goulds Pumps, Inc. ("Goulds") warrants to the original purchaser that your i-ALERT®2 Equipment Health Monitor (the "Product") shall be free from defects in materials and workmanship under normal use for a period of one (1) year from the date of shipment. This Limited Warranty does not cover software embedded in the Product and the services provided by Goulds to owners of the Product.

Due to the varied ways that Product(s) can be accessed and/or configured during use, battery life is excluded from warranty. It is your responsibility to backup any data, software, or other materials you may have stored or preserved on the Product. It is likely that such data, software, or other materials will be lost or reformatted during service, and Goulds will not be responsible for any such damage or loss. Recovery and reinstallation of software programs and user data are not covered under this Limited Warranty. The Limited Warranty does not apply to any software, even if packaged or sold with the Product or embedded in the Product. We are not liable for any damage a mobile app may inflict on companion product.

1.4 Safety

WARNING:
- The operator must be aware of the pumpage and take appropriate safety precautions to prevent physical injury.
1.5 Safety terminology and symbols

About safety messages

It is extremely important that you read, understand, and follow the safety messages and regulations carefully before handling the product. They are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product
- Product malfunction

Hazard levels

<table>
<thead>
<tr>
<th>Hazard level</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DANGER:</strong></td>
<td>A hazardous situation which, if not avoided, will result in death or serious injury</td>
</tr>
<tr>
<td><strong>WARNING:</strong></td>
<td>A hazardous situation which, if not avoided, could result in death or serious injury</td>
</tr>
<tr>
<td><strong>CAUTION:</strong></td>
<td>A hazardous situation which, if not avoided, could result in minor or moderate injury</td>
</tr>
</tbody>
</table>
| **NOTICE:**  | • A potential situation which, if not avoided, could result in undesirable conditions  

1.6 Safety regulations for Ex-approved products in potentially explosive atmosphere

Description of ATEX

The ATEX directives are a specification enforced in EU for electrical and non-electrical equipment. ATEX deals with the control of potentially explosive atmospheres and the standards of equipment and protective systems used within these atmospheres. The relevance of the ATEX requirements is not limited to Europe. You can apply these guidelines to equipment installed in any potentially explosive atmosphere.
Description of SGS

The SGS Mark is proof of product compliance to North American safety standards. Authorities Having Jurisdiction (AHJs) and code officials across the US and Canada accept the ETL Listed Mark as proof of product compliance to published industry standards.

Description of IECEx

The IECEx certificates of conformity attest that a sample of the Ex product, have been independently tested and found to comply with the International Standards. It also attests that the manufacturing site has been audited to verify that the manufacturer’s quality system meets IECEx requirements.

Safety regulations regarding the Battery

Do not charge, short circuit, crush, dissemble, heat above 100°C (212°F), incinerate or expose contents to water.

Personal requirements

ITT disclaims all responsibility for work done by untrained and unauthorized personnel.

These are the personnel requirements for Ex-approved products in potentially explosive atmospheres:

- All users must know about the risks of electric current and the chemical and physical characteristics of the gas and/or vapor present in hazardous areas.
- The installation for Ex-approved products must be made in conformity to the international or national standards (IEC/EN 60079-17).

1.7 Product approval standards

https://www.ittproservices.com/aftermarket-products/monitoring/i-alert2-condition-monitor/country-certifications/

Radio Certifications

North America USA and Canada certifications

Standards tested to:
UL 913
UL 60079-0
UL 60079-11
CSA-C22.2 No. 157-92
CSA-C22.2 No. 60079-0:11
CSA-C22.2 No. 60079-11:14

Markings North America:
Class I, II, III; Division 1; Groups A, B, C, D, E, F, G T4
Class I; Zone 0, AEx ia IIC T4 Ga
Class I, Zone 0, Ex ia IIC T4 Ga
Ambient temperature: -20°C to 70°C | -4°F to 158°F
Europe and Worldwide certifications

Standards tested to:

ATEX
EN 60079-0:2012
EN 60079-11:2012
EN 60079-26:2007+COR1:2011
EN 50303:2000

IECEx
IEC 60079-0:2011
IEC 60079-11:2011
IEC 60079-26:2006

ATEX and IECEx Markings
ATEX Certificate Number: ExVeritas 22ATEX1432X
IECEx Certificate Number: IECEx EXV 22.0061X
Ex ia IIC T4 Ga
CE 2585 II 2 G Ex ia IIC T4 Ga
Ambient Temperature: -20°C to +70°C (-4°F to 158°F)

Electromagnetic Compatibility Certifications (EMC)

Standards for testing i-ALERT®3 Equipment Health Monitor
Radiated Emissions
1.7 Product approval standards

FCC 47CFR 15 Subpart B:2014
EN 61000-6-4:2007

Electro-Static Discharge Immunity Test
(EN 61000-4-2:1995 per EN 61000-6-2:2007 +AMD 1 Cor 12)
(EN 61000-4-2:2009 per ETSI EN 301 489-1 V1.9.2
(EN 61000-4-3:2002 per EN 61000-6-2:2007 +AMD 1 Cor 12)
(EN 61000-4-3:2006+A1:2008+A2:2010 per ETSI EN 301 489-1 V1.9.2

Power Frequency Magnetic Field Immunity Test
(EN 61000-4-8 1993 per EN 61000-6-2:2007 +AMD 1 Cor 12)

Standards for testing Bluetooth radio
Industry Canada, Interference-Causing Equipment Standard for Information Technology Equipment (ITE)
ICES-003 Issue 5 August 2012

Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments CENELEC EN 61000-6-2:2007 +AMD 1 Cor 12

Electromagnetic compatibility (EMC) Generic standards - Emission standard for industrial environments
CENELEC EN 61000-6-4:2007

Electromagnetic Compatibility (EMC) standard for radio equipment and services;
Part 1: Common technical requirements
ETSI EN 301 489-1 V1.9.2 (2011-09)

ElectroMagnetic Compatibility (EMC) standard for radio equipment;
Part 17: Specific conditions for Broadband Data Transmission Systems
ETSI EN 301 489-17 V2.2.1 (2012-09)
2 Product Description

2.1 General description i-ALERT®3 Condition Monitor

Description

The i-ALERT®3 Equipment Health Monitor is a compact, battery-operated monitoring device that continuously measures the vibration and temperature of the pump. The i-ALERT®3 Equipment Health Monitor uses blinking red LED and wireless notification to alert the pump operator when the pump exceeds vibration and temperature limits. This allows the pump operator to make changes to the process or the pump before catastrophic failure occurs. The Equipment Health Monitor is also equipped with a single green LED to indicate when it is operational and has sufficient battery life.

The i-ALERT®3 Equipment Health Monitor also contains a Bluetooth radio that communicates to certain Bluetooth 4.0 equipped devices through a mobile application.

Data is shared between the i-ALERT®3 Equipment Health Monitor, the mobile application, phone, and the data servers.

The i-ALERT®3 Equipment Health Monitor will communicate sensor related data (such as vibration, temperature, runtime information, and device statistics) stored in the device to the mobile application. The mobile application will send commands to the device.

The Mobile application will back up device data as well as app usage information on the data servers.

The data servers will send the mobile application equipment technical data.

For full details about data storage and rights please review the Privacy Policy.

Alarm mode

The i-ALERT®3 Equipment Health Monitor enters alarm mode when either vibration or temperature limits are exceeded over two consecutive readings within a 10 minute period. Alarm mode is indicated with 1 (one) red flashing LED within 2 (two) second intervals.

Warning and alarm values

<table>
<thead>
<tr>
<th>Variable</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (default)</td>
<td>80°C</td>
</tr>
<tr>
<td>Vibration Alarm (0.1-1.5 ips)</td>
<td>100% increase over the baseline level</td>
</tr>
<tr>
<td>Vibration Warning (0.1-1.5 ips)</td>
<td>75% increase over the baseline level</td>
</tr>
</tbody>
</table>

Battery life

The i-ALERT®3 Equipment Health Monitor battery (PN K21912A) is replaceable. The battery life is not covered as part of the standard 5-year pump warranty, but is covered under the 1-year i-ALERT3 warranty, provided it is used under "normal operating conditions". The following specifies the "normal operating conditions" in which the 1-year battery life is determined:

- Temperature (max sustained mounted surface temperature): 78°C | 172°F
- Dashboard connections (including trend download): Once per day (max)
- FFT and Time Waveform usage: One tri-axial request per 14 days (max)
- Operation time in Alarm: > 25% of time
3 Installation

3.1 Installation

3.1.1 Attach the i-ALERT®3 Equipment Health Monitor to the pump

CAUTION:
Always wear protective gloves. The equipment and the i-ALERT®3 device can be hot.

Mounting options

Table 1:

<table>
<thead>
<tr>
<th>Mill a Slot</th>
<th>Drill and Tap</th>
<th>Epoxy¹</th>
<th>Magnetic Mounting Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screw: ¼-28 x 1.125in</td>
<td>Screw: ¼-28 x 1.5in</td>
<td>Screw: ¼-28 x 1.125in</td>
<td>Screw 1: ¼-28 x 1.125in</td>
</tr>
<tr>
<td>Slot: 2.25in L x 1.6in W</td>
<td>Tap: ¼-28 UNF x ¾in deep</td>
<td>Epoxy: application specific</td>
<td>Screw 2: ¼-28 x 0.75in</td>
</tr>
<tr>
<td>Temperature: ****</td>
<td>Temperature: **</td>
<td>Temperature: ***</td>
<td>Temperature: *</td>
</tr>
<tr>
<td>Prep Time: **</td>
<td>Prep Time: **</td>
<td>Prep Time: ***</td>
<td>Prep Time: ****</td>
</tr>
</tbody>
</table>

Epoxy¹ Not included

Legend: ** = Good   *** = Better   **** = Best

Epoxy recommendation

The epoxy used should be a two-part putty in stick form (not liquid) type, which contains metallic particles in order to enhance heat transfer. Epoxy of this type is commonly found at hardware and home improvement stores. The temperature range required and specific application determine the epoxy choice. Mount
i-ALERT®3 device to base using provided ¼-28 cap screw. Torque screw to 6 lb-ft. using a 5/32” size Allen Head wrench prior to the application of the epoxy.

Location selection

The i-ALERT®3 device should be mounted on pumps or other rotating equipment as shown in the first image under "Mounting Options" (above) with the LED’s aligned with the shaft in order to maintain the preferred axis orientation shown below. Care should be taken to locate the device over the bearings, and to avoid placement on compliant surfaces such as coupling guards, and other light sheet metal. It is preferable to have one device over each bearing, but if that is not possible, monitoring the drive end is essential.

![Location selection diagram](image)

Figure 4: Location selection

The temperature seen by the i-ALERT®3 temperature sensor maybe different from the surface temperature of the object it is mounted to. Mounting the i-ALERT®3 directly to the machine will give the most accurate reading. The differences are due to the temperature gradient that exists between the i-ALERT®3 and the machines surface. This gradient can be greater when the ambient temperature is very different from the surface temperature.

Table 2: Temperature difference based on mounting method

<table>
<thead>
<tr>
<th>Mounting method</th>
<th>Approximate difference in temperature reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>i-ALERT®3 directly mounted to machine</td>
<td>-11°C</td>
</tr>
<tr>
<td>i-ALERT®3 mounted on adapter</td>
<td>-22°C</td>
</tr>
</tbody>
</table>

CAUTION:

Battery Safety Guidelines

- The battery can not be replaced with anything other than the proprietary battery pack (K21912A).
- Using any other battery pack will void warranty and replacement of a battery with an incorrect type that can defeat a safeguard; would cause issues in functionality and safety risk
- Battery disposal requirements should be attained by the local authorities. Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion is not liable by ITT Goulds Pumps Inc.
- Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas is not liable to ITT Goulds Pumps Inc
- Battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas voids our installation requirements.
App installation and registration

For installation guidance, video links can be found at the following site:
http://www.ittproservices.com/aftermarket-products/monitoring/i-alert2-condition-monitor/

To download the latest App, search for “i-ALERT®3 condition monitor” in the Apple App Store.

To access the App it is necessary to create an account using a valid email in the registration tab on the login page.

Figure 5: i-ALERT®3 registration
4 Commissioning, Startup, Operation, and Shutdown

4.1 Activate the i-ALERT®3 Equipment Health Monitor

Steps to activate the i-ALERT®3 Equipment Health Monitor

1. Place the battery module (1) on the sensor module (2)
2. Once the two modules are collapsed into one the i-ALERT®3 will turn on
3. When activated a sequence of flashing LEDs will start to indicate that the unit is powered on.
4. At this state the unit needs to be connected by a smart device using the i-ALERT application or an i-ALERT Gateway to start condition monitoring functionalities.

**WARNING:**

- Contains Lithium battery.
- Do not crush or disassemble.
- Never heat the condition monitor to temperatures in excess of 100°C | 212°F. Heating to these temperatures could result in death or serious injury.

**CAUTION:**

Always wear protective gloves. The pump and condition monitor can be hot.

4.2 i-ALERT®3 Equipment Health Monitor routine operation

**Measurement interval**

The measurement interval for the condition monitor during normal and alarm operation is 5 minutes.
When the monitor measures a reading beyond the specified temperature and vibration limits, the appropriate red LED flashes (after 2 consecutive readings). After the process or pump condition that causes the alarm is corrected, the condition monitor returns to normal mode after one normal-level measurement.

Alarm mode

The condition monitor’s alarm mode is activated after two consecutive readings. When the alarm mode is on, you should investigate the cause of the condition and make necessary corrections in a timely manner.

Wireless integration

A Bluetooth Low Energy Radio is utilized to communicate condition monitoring information to a mobile Smart device that the operator can easily view and react to.
5 Maintenance

5.1 Guidelines for i-ALERT®3 Equipment Health Monitor disposal

Precautions

WARNING:

- Never heat the condition monitor to temperatures in excess of 100°C | 212°F. Heating to these temperatures could result in death or serious injury.
- Never dispose of the condition monitor in a fire. This could result in death or serious injury.

Guidelines

This Product Contains Lithium Thionyl Chloride therefore the local Waste management companies can provide assistance in the disposal of the device that contain this type of battery.
### 6 Troubleshooting

#### 6.1 i-ALERT®3 Equipment Health Monitor troubleshooting

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are no red, green, or blue flashing LED.</td>
<td>The battery is dead.</td>
<td>Replace the equipment health monitor.</td>
</tr>
<tr>
<td></td>
<td>The unit is in sleep mode.</td>
<td>Activate the condition monitor using magnet.</td>
</tr>
<tr>
<td></td>
<td>The unit is malfunctioning.</td>
<td>Consult your ITT representative for a warranty replacement.</td>
</tr>
<tr>
<td>The red LED is flashing, but the temperature and vibration are at acceptable levels.</td>
<td>The baseline is set below normal operating limits.</td>
<td>Check the temperature and vibration levels and request new baseline. Or manually change alarm limits.</td>
</tr>
<tr>
<td></td>
<td>The unit is malfunctioning.</td>
<td>Consult your ITT representative for a warranty replacement.</td>
</tr>
</tbody>
</table>

For connection issues with smart devices, please visit [www.i-ALERT.com](http://www.i-ALERT.com)

For ITT’s privacy Policy, click here: [http://itt.com/privacy/](http://itt.com/privacy/)

For User SW License Agreement, click here: [http://i-alert.com/support/app-privacy-policy/](http://i-alert.com/support/app-privacy-policy/)
Visit our website for the latest version of this document and more information:
https://www.i-alert.com/products/i-alert3-sensor/