

# CERTIFICATE OF CONFORMITY



Member of the FM Global Group

## 1. HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS

2. **Certificate No:** FM23US0090X
3. **Equipment:** 210 Flow Meter  
(Type Reference and Name) IISB03 and IISB04 Intrinsically Safe Barriers  
TU, NPT, BF, RV and PG Flow Transducers
4. **Name of Listing Company:** The Bionetics Corporation
5. **Address of Listing Company:** 770 Brookside Plaza Drive,  
Westerville, Ohio 43081, USA

6. The examination and test results are recorded in confidential report number:

PR463746 dated 26 November 2023

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

FM 3600:2022, FM 3610:2021, FM 3615:2022, FM 3810:2021, NEMA 250:1991, ANSI/UL 60079-0:2020,  
ANSI/UL 60079-11:2018, ANSI/UL 61010-1:2012

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

10. **Equipment Ratings:**

See Annex

11. **The marking of the equipment shall include:**

See Annex

12. **Description of Equipment:**

See Annex

**Certificate issued by:**

J.E. Marquedant  
VP, Manager - Electrical Systems

26 November 2023

Date

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA  
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

F 347 (Apr 21)



## SCHEDULE

US Certificate Of Conformity No: FM23US0090X



Member of the FM Global Group

See Annex

### 13. Specific Conditions of Use:

See Annex

### 14. Test and Assessment Procedure and Conditions:

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

### 15. Schedule Drawings

A copy of the technical documentation has been kept by FM Approvals.

### 16. Certificate History

Details of the supplements to this certificate are described below:

Date	Description
26 November 2023	Original Issue.

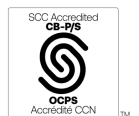
To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA

T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

F 347 (Apr 21)



## SCHEDULE

US Certificate Of Conformity No: FM23US0090X



Member of the FM Global Group

# ANNEX

## 210 Flow Meter

### Equipment Ratings:

Explosionproof for Class I, Division 1, Groups B, C and D; Dust-Ignitionproof for Class II/III, Division II/III, Division 1, Groups E, F and G; Suitable for Class I, Zone 1, IIB+H<sub>2</sub>, T6 Ta = +60°C Hazardous (Classified) Locations with an indoor/outdoor environmental rating of Type 4X.

### Markings:

Class I, Division 1, Groups B, C, D  
Class I, Zone 1, IIB+H<sub>2</sub>  
Class II, Division 1, Groups E, F, G  
Class III, Division 1  
Type 4X, T6, Ta = 60°C

### Description of Equipment:

The 210 Flow Meter uses a thermal sensing technique to measure liquids and gas. The 210 Flow Meter has the ability to communicate with a handheld control device (not included in the scope of this project) and also offers infrared controls on the local display. Both handheld and infrared controls allow users to change readings and calibrate the instrument without compromising the explosionproof rating. The flow meter consists of two elements, a sensor and a transmitter. The sensors come in two basic designs, non-intrusive (TU and TUL style) and intrusive (insertion probe) sensor. Both sensors utilize the same thermal sensing technology. The thermal sensing technology uses two temperature sensors, one is in thermal equilibrium with fluid and provides a fluid temperature reference, while the second temperature sensor is located near a heater so that its temperature is slightly above the fluid. The rate at which heat is removed from the heater sensor by the process stream is related to fluid velocity. The measured temperature differential between the reference sensor and the heated sensor is a function of flow rate. Both sensors configurations are designed with the same electronics. The electronics are housed in an Adalet enclosure model number XDHMFGCX.

Intrusive (insertion) style probe sensor: The intrusive insertion probe is mounted (inserted) into the process pipe and mounted by either a threaded fitting or a flanged fitting. The probe comes in a varying length up to a maximum length of 3 ft. The all welded 316 stainless steel sensors are threaded to the Adalet enclosure using the ½ in FNPT connection in the enclosure. The sensors internal volume is separated from the enclosure internal volume by Stycast 2651 with Catalyst 9M Cement compound. The seven conductor sensor cable passes through the cement and is terminated inside the electronics housing. For this program the Intrusive (insertion) style probe sensor sample as examined including the cement with sensor wire passing through.

The Adalet XDHM Series Instrument Housing was previously satisfactorily examined and tested under FM Approval Project 3016299 and 2B9A4.AE as Explosionproof for Class I, Division 1, Groups B, C and D, Zone 1, IIB+H<sub>2</sub>; Class II, III, Division 1, Groups E, F, and G hazardous (classified) locations; with an indoor/outdoor rating of Type 4X/IP66. FM Approvals satisfactorily examined and tested Adalet XDHL Series Instrument Housing against the Canadian standards under FM Approval project 0B5Q3.AE for a rating of Class I, Division 1, Groups B, C, and D, Class II, III, Division 1,

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA

T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

F 347 (Apr 21)



Page 3 of 6

## SCHEDULE

US Certificate Of Conformity No: FM23US0090X



Member of the FM Global Group

Groups E, F and G hazardous locations; with an indoor/outdoor rating of Type 4X. The Adalet enclosures are certified under CSA International Certification Number LR27991-73. The Adalet model XDHM and XDHL are identical construction with the exception of the free internal volume. The XDHL series enclosure has a larger free internal volume than the client chosen XDHM enclosure. During ignition testing conducted under FM Approval Project 0B5Q3.AE the highest recorded pressure for US Group B gas mixture was 181psi, and the highest recorded pressure for the Canadian Group B gas mixture was also 181psi. During ignition testing conducted under FM Approval Project 2B9A4.AE the highest ignition pressure recorded for Group B gas mixture was 125psi. This is considered acceptable for Canada. The Adalet XDHM Series Instrument Housing consists of a cast aluminum base and two six optional covers to form a two compartment solid wall enclosure with options for a ½ inch through hole in the dividing wall or no dividing wall. The covers are flat or dome either solid or window and have a neoprene O-ring seal between the cover and the base to prevent the ingress of dust and water. The enclosures are available with two window cover designs both include a glass lens and retaining ring assembly. The window cover uses ADACO XSC cement material. The base has options for two ¾ in NPT or ½ in NPT opening for connection of conduit, or end instrument assemblies. There is also a rectangular flat on the housing base with an entry for connection of conduit, or end instrument assemblies. The entry in the flat can be ½ in or ¾ in NPT threads. All but one conduit opening is supplied with a conduit plug which is suitable for hazardous locations. The cover and base are constructed of aluminum alloy 357 or the optional material 316 Stainless Steel.

### **210abcdefgh Flow Meter**

- a = Enclosure and Display Selection: X, XD, XT or XDT.
- b = Sensor Type/Size: NPT/2I, BF/2I, TU 1/16-1/2, or TUL 1/16-1/4.
- c = Sensor Material/Options: Stainless Steel, Hastelloy C-276, Alloy 20 or Monel.
- d = Stream Temperature: 0-150°F, 151-350°F, 351-500°F, or above 500°F.
- e = End Fitting (for TU transducers): MNPT, Forged ANSI Rated Flanges.
- f = Operating Pressure: TU or TUL = 6000psi, 4500psi, 3250psi, or 2250psi.  
Insertion Probe = 1500psi.
- g = Output Options: 4/20, 0/5, 0/10, RS.
- h = Additional Options: SWn, ER, HPC, or FM.

## **IISB03 Intrinsically Safe Barrier**

### **Equipment Ratings:**

Associated Intrinsically Safe Apparatus for connection to Class I, II, and III, Division 1, Groups A, B, C, D, E, F and G in accordance with control drawing 17010-16, Entity; and Associated Intrinsically Safe Zone 0, [AEx ia Ga] IIC in accordance with control drawing 17010-16, Entity.

### **Markings:**

Associated Intrinsically Safe Apparatus with connection for:  
Class I, II, III, Division 1, Groups ABCDEFG - 17010-16; Entity;  
Zone 0, [AEx ia Ga] IIC - 17010-16; Entity;

### **Description of Equipment:**

The IISB03 Intrinsically Safe Barrier is a five channel barrier, it provides one high power channel and four low power channels. The barrier is intended for use with the TU, NPT, BF, RV and PG Flow Transducers. The IISB03 consists of

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA  
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

F 347 (Apr 21)



## SCHEDULE

US Certificate Of Conformity No: FM23US0090X



Member of the FM Global Group

two circuit boards, epoxy encapsulated in single compartment ABS Plastic electronics housing with terminal blocks protruding from the epoxy. The terminal blocks are located on opposite ends of the top surface of the barrier housing separating hazardous area connections from the input connections. The Model IISB03 Intrinsically Safe Barrier is rated  $U_m = 250V_{ac}$  and operate at the entity parameters specified below.

### ***IISB03. Intrinsically Safety Barrier.***

Entity Parameters:  $V_t = 18.15V$ ,  $I_t = 404mA$ ,  $P_o = 1.3W$ ,  $C_a = 0.28\mu F$ ,  $L_a = 0.2mH$

Entity Parameters (Channel 1):  $V_{oc} = 14.28V$ ,  $I_{sc} = 290mA$ ,  $P_o = 856mW$ ,  $C_a = 0.68\mu F$ ,  $L_a = 0.4mH$

Entity Parameters (Channel 2-5):  $V_{oc} = 15.75$ ,  $I_{sc} = 22.8mA$ ,  $P_o = 88.6mW$ ,  $C_a = 0.478\mu F$ ,  $L_a = 62mH$

### **Specific Conditions of Use:**

1. The IISB03 shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application including access only by the use of a tool.

## **IISB04 Intrinsically Safe Barrier**

### **Equipment Ratings:**

Associated Intrinsically Safe Apparatus for connection to Class I, II, and III, Division 1, Groups A, B, C, D, E, F and G in accordance with control drawing 17010-17, Entity; and Associated Intrinsically Safe Zone 0, [AEx ia Ga] IIC in accordance with control drawing 17010-17, Entity.

### **Markings:**

Associated Intrinsically Safe Apparatus with connection for:  
Class I, II, III, Division 1, Groups ABCDEFG - 17010-17; Entity;  
Zone 0, [AEx ia Ga] IIC - 17010-17; Entity;

### **Description of Equipment:**

The IISB04 Intrinsically Safe Barrier is a six channel barrier, it provides one high power channel and five low power channels. The barrier is intended for use with the TU, NPT, BF, RV and PG Flow Transducers. The IISB04 consists of two circuit boards, epoxy encapsulated in single compartment ABS Plastic electronics housing with terminal blocks protruding from the epoxy. The terminal blocks are located on opposite ends of the top surface of the barrier housing separating hazardous area connections from the input connections. The Model IISB04 Intrinsically Safe Barrier is rated  $U_m = 250V_{ac}$  and operate at the entity parameters specified below.

### ***IISB04. Intrinsically Safety Barrier.***

Entity Parameters:  $V_t = 15.5V$ ,  $I_t = 530mA$ ,  $P_o = 1.1W$ ,  $C_a = 0.508\mu F$ ,  $L_a = 0.1mH$

Entity Parameters (Channel 1):  $V_{oc} = 14.28V$ ,  $I_{sc} = 480mA$ ,  $P_o = 998mW$ ,  $C_a = 0.68\mu F$ ,  $L_a = 0.2mH$

Entity Parameters (Channel 2-5 & 7):  $V_{oc} = 7.14$ ,  $I_{sc} = 10mA$ ,  $P_o = 18mW$ ,  $C_a = 13.5\mu F$ ,  $L_a = 317mH$

### **Specific Conditions of Use:**

1. The IISB04 shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application including access only by the use of a tool.

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA

T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

F 347 (Apr 21)



Page 5 of 6

## SCHEDULE

US Certificate Of Conformity No: FM23US0090X



Member of the FM Global Group

### TU, NPT, BF, RV and PG Flow Transducers

#### Equipment Ratings:

Intrinsically Safe for Class I, II, and III, Division 1, Group A, B, C, D, E, F, and G, T4 in accordance with control drawing 17010-16 or 17010-17; Intrinsically Safe for Zone 0, AEx ia IIC T4 Ga in accordance with control drawing 17010-16 or 17010-17, with an ambient operating temperature of -40°C to +60°C.

#### Markings:

Class I, II, III, Division 1, Groups A, B, C, D, E, F, G T4 Ta = -40°C to +60°C - 17010-16 or 17010-17;  
Zone 0, AEx ia IIC T4 Ga Ta = -40°C to +60°C - 17010-16 or 17010-17;

#### Description of Equipment:

The transducers use heat loss from a heater to measure fluid flow rate in a tube or by insertion in a duct. The transducers use two temperature sensors mounted to a flow tube or insertion probe in the flow stream. One of the sensors is influenced by a heater; the other sensor is a reference, and the temperature differential between the sensors is a function of the flow rate. The flow tube or insertion probe used in the transducers are constructed from stainless steel or specialty alloys. The transducers use two temperature sensors, either mounted to the outside of a flow tube, or installed in metallic probes inserted into the flow stream. The TU, NPT, BF, RV and PG Flow Transducers are rated for use in a process temperature range of -40°C to 60°C.

**TU, NPT, BF, RV and PG. Flow Transducers.**

#### Specific Conditions of Use:

1. Modules with a non-metallic enclosure may be an electrostatic hazard, clearing of the equipment should be done only with a damp cloth.

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA

T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

F 347 (Apr 21)



Page 6 of 6