CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM16US0332X**
3. **Equipment:** **Model Logix 3800 Series Digital Positioner**
   (Type Reference and Name)
4. **Name of Listing Company:** **Flowserve US Incorporated**
5. **Address of Listing Company:** **1350 Mountain Springs Pkwy,**
   Springville Operations
   Springville, UT 84663
   USA
6. The examination and test results are recorded in confidential report number:

   3059398 dated 27th April 2017
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM Class 3600:2011, FM Class 3610:2015, FM Class 3611:2016, FM Class 3615:2006,
   FM Class 3616:2011, FM Class 3810:2005, ANSI/ISA-12.12.01-2016,
   ANSI/ISA 60079-0:2013, ANSI/UL 60079-1:2015, ANSI/ISA 60079-11:2014, ANSI/ISA 60079-15:2012,
   ANSI/ISA-60079-31: 2015, ANSI/ISA 61010-1:2004, ANSI/UL 50E:2015, ANSI/IEC 60529:2014
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.

Certificate issued by:

J. E. Marquedant
Manager, Electrical Systems

4 December 2017
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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SCHEDULE

US Certificate Of Conformity No: FM16US0332X

10. Equipment Ratings:

Listing 1

Explosionproof for use in Class I, Division 1, Groups A, B, C and D or Groups B, C and D; Temperature Class T4 Tamb = -50˚C or -40˚C to +85˚C; Temperature Class T5 Tamb = -50˚C or -40˚C to +55˚C; Temperature Class T6 Tamb = -50˚C or -40˚C to +45˚C;

Dust-Ignitionproof for use in Class II, III, Division 1, Groups E, F and G; Temperature Class T4 Tamb = -50˚C or -40˚C to +85˚C; Temperature Class T5 Tamb = -50˚C or -40˚C to +55˚C; Temperature Class T6 Tamb = -50˚C or -40˚C to +45˚C;

Nonincendive for use in Class I, II, III, Division 2, Groups A, B, C, D, E, F, and G; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C;

Flameproof for use in Class I, Zone 1, AEx db IIC T6…T4 Gb; Temperature Class T4 Tamb = -50˚C to +85˚C; Temperature Class T5 Tamb = -50˚C to +55˚C; Temperature Class T6 Tamb = -50˚C to +45˚C;

Non-Sparking for use in Class I, Zone 2, AEx nA IIC T6…T4 Gc; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C;

Equipment dust ignition protection by enclosure for use in Zone 21, AEx tb IIIC T105 ˚C Db Tamb = -50˚C to +85˚C.

Hazardous (Classified) Locations/Explosive Atmospheres;

indoor and outdoor, Type 4X; IP66.

Listing 2

Intrinsically Safe (Entity) for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C; in accordance with Control Drawing No. 355312;

Fieldbus Intrinsically Safe Concept (FISCO) for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C; in accordance with Control Drawing No. 355312;

Nonincendive for use in Class I, II, III, Division 2, Groups A, B, C, D, E, F, and G; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C;

Intrinsically safe (Entity) for use in Class I, Zone 0, AEx ia IIC T6…T4 Ga; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C in accordance with Control Drawing No. 355312;

Fieldbus Intrinsically Safe Concept (FISCO) for use in Class I, Zone 0, AEx ia IIC T6…T4 Ga; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C in accordance with Control Drawing No. 355312;

Intrinsically safe (Entity) for use in Class I, Zone 1, AEx ib IIC T6…T4 Gb; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C in accordance with Control Drawing No. 355312;

SCHEDULE

US Certificate Of Conformity No: FM16US0332X

Fieldbus Intrinsically Safe Concept (FISCO) for use in Class I, Zone 1, AEx ib IIC T6…T4 Gb; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C in accordance with Control Drawing No. 355312;

Intrinsically safe (Entity) for use in Class I, Zone 2, AEx ic IIC T6…T4 Gc; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C in accordance with Control Drawing No. 355312;

Non-Sparking for use in Class I, Zone 2, AEx nA IIC T6…T4 Gc; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C;

Intrinsically safe (Entity) for use in Zone 20, AEx ia IIIC T105°C Da Tamb = -55˚C to +85˚C; in accordance with Control Drawing No. 355312;

Hazardous (Classified) Locations/Explosive Atmospheres;

indoor and outdoor, Type 4X; IP66.

Listing 3

Intrinsically Safe (Entity) for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C; in accordance with Control Drawing No. 355312;

Fieldbus Intrinsically Safe Concept (FISCO) for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C; in accordance with Control Drawing No. 355312;

Nonincendive for use in Class I, II, III, Division 2, Groups A, B, C, D, E, F, and G; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C;

Explosionproof for use in Class I, Division 1, Groups A, B, C and D or Groups B, C and D; Temperature Class T4 Tamb = -50˚C or -40˚C to +85˚C; Temperature Class T5 Tamb = -50˚C or -40˚C to +55˚C; Temperature Class T6 Tamb = -50˚C or -40˚C to +45˚C;

Dust-Ignitionproof for use in Class II, III, Division 1, Groups E, F and G; Temperature Class T4 Tamb = -50˚C or -40˚C to +85˚C; Temperature Class T5 Tamb = -50˚C or -40˚C to +55˚C; Temperature Class T6 Tamb = -50˚C or -40˚C to +45˚C;

Intrinsically safe (Entity) for use in Class I, Zone 0, AEx ia IIC T6…T4 Ga; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C in accordance with Control Drawing No. 355312;

Fieldbus Intrinsically Safe Concept (FISCO) for use in Class I, Zone 0, AEx ia IIC T6…T4 Ga; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C in accordance with Control Drawing No. 355312;

Intrinsically safe (Entity) for use in Class I, Zone 1, AEx ib IIC T6…T4 Gb; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to

+45˚C in accordance with Control Drawing No. 355312;

Fieldbus Intrinsically Safe Concept (FISCO) for use in Class I, Zone 1, AEx ib IIC T6…T4 Gb; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C in accordance with Control Drawing No. 355312;

Intrinsically safe (Entity) for use in Class I, Zone 2, AEx ic IIC T6…T4 Gc; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C in accordance with Control Drawing No. 355312;

Intrinsically safe (Entity) for use in Zone 20, AEx ia IIIC T105°C Da Tamb = -55˚C to +85˚C; in accordance with Control Drawing No. 355312;

Fieldbus Intrinsically Safe Concept (FISCO) for use in Zone 20, AEx ia IIIC T105°C Da Tamb = -55˚C to +85˚C; in accordance with Control Drawing No. 355312;

Non-Sparking for use in Class I, Zone 2, AEx nA IIC T6…T4 Gc; Temperature Class T4 Tamb = -55˚C to +85˚C; Temperature Class T5 Tamb = -55˚C to +55˚C; Temperature Class T6 Tamb = -55˚C to +45˚C;

Flameproof for use in Class I, Zone 1, AEx db IIC T6…T4 Gb; Temperature Class T4 Tamb = -50˚C to +85˚C; Temperature Class T5 Tamb = -50˚C to +55˚C; Temperature Class T6 Tamb = -50˚C to +45˚C;

Equipment dust ignition protection by enclosure for use in Zone 21, AEx tb IIIC T105 ˚C Db Tamb = -50˚C to +85˚C.

Hazardous (Classified) Locations/Explosive Atmospheres;

indoor and outdoor, Type 4X; IP66.

11. The marking of the equipment shall include:
Listing 1

Explosionproof / Dust-Ignitionproof

CL I, Div 1, Gp A-D T6…T4 or CL I, Div 1, Gp B-D T6…T4

CL II, III, Div 1, Gp E-G T6…T4

T4 (-40˚C or -50˚C ≤ Tamb ≤ +85˚C);

T5 (-40˚C or -50˚C ≤ Tamb ≤ +55˚C);

T6 (-40˚C or -50˚C ≤ Tamb ≤ +45˚C);

CL I, Zone 1, AEx db IIC T6…T4 Gb

T4 (-50˚C ≤ Tamb ≤ +85˚C);

T5 (-50˚C ≤ Tamb ≤ +55˚C);

T6 (-50˚C ≤ Tamb ≤ +45˚C);

Zone 21, AEx tb IIIC T105°C Db -50˚C ≤ Tamb ≤ +85˚C;

SCHEDULE

US Certificate Of Conformity No: FM16US0332X

Non-incendive
CL I, II, III, Div 2 Gp A-G T6…T4
CL I, Zone 2, AEx nA IIC T6…T4 Gc
T4 (-55˚C ≤ Tamb ≤ +85˚C);
T5 (-55˚C ≤ Tamb ≤ +55˚C);
T6 (-55˚C ≤ Tamb ≤ +45˚C);

Type 4X; IP66

Listing 2
Intrinsically Safe
CL I, II III, Div 1, Groups A-G; T6…T4
CL I, Zone 0, AEX ia IIC T6…T4 Ga
CL I, Zone 1, AEX ib IIC T6…T4 Gb
CL I, Zone 2, AEX ic IIC T6…T4 Gc
T4 (-55˚C ≤ Tamb ≤ +85˚C);
T5 (-55˚C ≤ Tamb ≤ +55˚C);
T6 (-55˚C ≤ Tamb ≤ +45˚C);
Zone 20, AEx ia IIIC T105°C Da
(-55˚C ≤ Tamb ≤ +85˚C);
Install in accordance with Control Drawing No. 355312;
FISCO Field Device or Entity Parameters

Non-incendive
CL I, II, III, Div 2 Gp A-G T6…T4
CL I, Zone 2, AEx nA IIC T6…T4 Gc
T4 (-55˚C ≤ Tamb ≤ +85˚C);
T5 (-55˚C ≤ Tamb ≤ +55˚C);
T6 (-55˚C ≤ Tamb ≤ +45˚C);

Type 4X; IP66

SCHEDULE

US Certificate Of Conformity No: FM16US0332X

Listing 3

Intrinsically Safe

CL I, II III, Div 1, Groups A-G; T6…T4

CL I, Zone 0, AEX ia IIC T6…T4 Ga

CL I, Zone 1, AEX ib IIC T6…T4 Gb

CL I, Zone 2, AEX ic IIC T6…T4 Gc

T4 (-55˚C ≤ Tamb ≤ +85˚C);

T5 (-55˚C ≤ Tamb ≤ +55˚C);

T6 (-55˚C ≤ Tamb ≤ +45˚C);

Zone 20, AEx ia IIIC T105°C Da

(-55˚C ≤ Tamb ≤ +85˚C);

Install in accordance with Control Drawing No. 355312;

FISCO Field Device or Entity Parameters

Explosionproof / Dust-Ignitionproof

CL I, Div 1, Gp A-D T6…T4 or CL I, Div 1, Gp B-D T6…T4

CL II, III, Div 1, Gp E-G T6…T4

T4 (-40˚C or -50˚C ≤ Tamb ≤ +85˚C);

T5 (-40˚C or -50˚C ≤ Tamb ≤ +55˚C);

T6 (-40˚C or -50˚C ≤ Tamb ≤ +45˚C);

CL I, Zone 1, AEx db IIC T6…T4 Gb

T4 (-50˚C ≤ Tamb ≤ +85˚C);

T5 (-50˚C ≤ Tamb ≤ +55˚C);

T6 (-50˚C ≤ Tamb ≤ +45˚C);

Zone 21, AEx tb IIIC T105°C Db -50˚C ≤ Tamb ≤ +85˚C;

Non-incendive

CL I, II, III, Div 2 Gp A-G T6…T4

CL I, Zone 2, AEx nA IIC T6…T4 Gc

T4 (-55˚C ≤ Tamb ≤ +85˚C);

T5 (-55˚C ≤ Tamb ≤ +55˚C);

T6 (-55˚C ≤ Tamb ≤ +45˚C);

Type 4X; IP66

SCHEDULE

US Certificate Of Conformity No: FM16US0332X

12. **Description of Equipment:**

Functionality - The Logix 3800 Series Digital Positioner is an electro-pneumatic positioner designed to control a variety of pneumatic actuators. Positioning is based on a balance of two signals; one proportional to the command input signal and the other proportional to the valve stem position.

Electrical - The Logix 3800 Positioner operates from a two wire 10V max, 4-20mA source or 9-30V, 18mA foundation fieldbus on terminals 8 and 9. There are also options for two discrete digital outputs, one analog input, and one digital input. These circuits are all isolated from one another and from the main circuitry. The circuitry is contained on two printed circuit boards which are completely encapsulated except for the LCD display side of the user interface board.

Mechanical - The Logix 3800 electronics are housed in a painted Aluminum enclosure assembly consisting of the main enclosure containing all electronics, attached to a manifold enclosure containing the process connections. The main enclosure has three access openings to the terminal facility which accommodate suitably certified cable entry devices. The entries can be either M20-1.5 or ½ - 14 NPT entries. In addition to the wiring entries, the enclosure incorporates two flanged joints that are secured by fasteners: one between the enclosure cover and base and one between the enclosure cover and viewing window. The bottom of the main enclosure has means to secure itself to a valve stem and inductively measure its position.

Operation Temperature Ranges
The ambient temperature ranges of the Model Logix 3800 Series Digital Positioner vary between -55°C to +85°C depending on the type of protection. Refer to the label marking, certificates and manual for the allowed ambient temperature ranges.

Electrical data
In type of protection intrinsic safety, connections can only be made to a certified intrinsically safe associated apparatus. The connections to the main terminals can be entity or FISCO as shown below.

Entity Connection:

Terminals	Label	Ui (Vmax)	Ii (Imax)	Pi (Pmax)	Ci	Li
8 & 9	Main Input	≤30V	≤380mA	≤5.32W	0	0
1 & 2	DO1 Input	≤30V	≤500mA	≤2.5W	10.34nF	0
6 & 7	DI IN 1	≤30V	≤380mA	≤5.32W	0	0
10 & 11	AO IN 1	≤30V	≤250mA	≤2W	0	0
12 & 13	AI IN	≤30V	≤250mA	≤3.8W	0	0
14 & 15	DO2 IN	≤30V	≤500mA	≤2.5W	10.34nF	0

FISCO Connection:

Terminals	Label	Ui (Vmax)	Ii (Imax)	Pi (Pmax)	Ci	Li
8 & 9	Main Input	≤30V	≤380mA	≤5.32W	0	0

All other protection techniques, the electronic connection has the following values:

Analog

Label	Terminals	Vdc	Idc
Main Input	8 & 9	10V	4-20mA
DO1 Input	1 & 2	6-40V	500mA
DI IN 1	6 & 7	2.5V-8V	10mA

SCHEDULE

US Certificate Of Conformity No: FM16US0332X

AO IN 1	10 & 11	10-40V	4-20mA
AI IN	12 & 13	10V	4-20mA
DO2 IN	14 & 15	6-40V	500mA

Fieldbus

Label	Terminals	Vdc	Idc
Main Input	8 & 9	9-30 Vdc	18mA

Listing 1

38ab-cde-fghi-jklm. Series Digital Positioner.

a = Communication: 2 or 4.
b = Housing: 1 or 2.
c = Certifications: 43 or 45.
d = Threaded Connections: E, M or G.
e = Actuation Medium: A or G.
f = Relay Type: D or L.
g = Action: 3 or 4.
h = Pressure Gauges: 0, 1, 2, 3, 4, A or B.
i = Gauge Orientation: O, R or L.
j = Diagnostics: 0 or 1.
k = Display: 0 or 1.
l = Feedback Shaft: 0, 1, 2, 3 or 4.
m = Mounting: 0, D, V or R.

Listing 2

38ab-cde-fghi-jklm. Series Digital Positioner.

a = Communication: 2 or 4
b = Housing: 0.
c = Certifications: 37.
d = Threaded Connections: E, M or G.
e = Actuation Medium: A or G
f = Relay Type: D or L.
g = Action: 3 or 4.
h = Pressure Gauges: 0, 1, 2, 3, 4, A or B.
i = Gauge Orientation: O, R or L.
j = Diagnostics: 0 or 1.
k = Display: 0 or 1.
l = Feedback Shaft: 0, 1, 2, 3 or 4.
m = Mounting: 0, D, or V.

Listing 3

38ab-cde-fghi-jklm. Series Digital Positioner.

a = Communication: 2 or 4.
b = Housing: 1 or 2.
c = Certifications: 34.
d = Threaded Connections: E, M or G.
e = Actuation Medium: A or G.
f = Relay Type: D or L.
g = Action: 3 or 4.
h = Pressure Gauges: 0, 1, 2, 3, 4, A or B.

i = Gauge Orientation: O, R or L.
j = Diagnostics: 0 or 1.
k = Display: 0 or 1.
l = Feedback Shaft: 0, 1, 2, 3 or 4.
m = Mounting: 0, D, or V.

13. **Specific Conditions of Use:**

Listing 1

1. Contact Flowserve for flame path information.
2. Discontinue use of equipment if the fasteners securing the enclosure cover or the cover window are damaged. Contact Flowserve for repair.
3. Using the box provided on the nameplate, the User shall permanently mark the type of protection chosen for the specific installation. Once the type of protection has been marked it shall not be changed.
4. Potential electrostatic charging hazard. Clean only with a damp cloth.

Listing 2 and Listing 3

1. Contact Flowserve for flame path information.
2. Discontinue use of equipment if the fasteners securing the enclosure cover or the cover window are damaged. Contact Flowserve for repair.
3. The Model 3800 Positioner enclosure contains Aluminium and is considered to present a potential risk of ignition by impact or friction. For EPL Ga Installations, care must be taken into account during installation and use to prevent impact or friction.
4. Using the box provided on the nameplate, the User shall permanently mark the type of protection chosen for the specific installation. Once the type of protection has been marked it shall not be changed.
5. Potential electrostatic charging hazard. Clean only with a damp cloth.

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
27th April 2017	Original Issue.
17th October 2017	Supplement 01: Report Reference: – 3061450 dated 17th October 2017. Documentation updated and evaluation conducted to qualify additional model code options, including a Stainless Steel enclosure, as well as verify that the equipment remains within the scope of the applied standards with respect to applicable ambient

SCHEDULE

US Certificate Of Conformity No: FM16US0332X

	pressure range. Electronics updates incorporated and ratings pertaining to the IS and NI protection concepts are removed accordingly as additional evaluation is required. Drawings updated accordingly in order to reflect design changes.
4th December 2017	Supplement 02: Report Reference: – 3062606 dated 4th December 2017 Description of the Change: Examination of new electronics for Intrinsically Safe and Nonincendive protection concepts. Added Intrinsically Safe and Nonincendive concepts back onto the certificate and listings. Clerical changes to the drawings.