CERTIFICATE OF CONFORMITY

1. **ELECTRICAL EQUIPMENT PER US REQUIREMENTS**

2. **Certificate No:** **FM18NUS0003**

3. **Equipment:** **TFX-500w Clamp-On Flow Meters**
   (Type Reference and Name)

4. **Name of Listing Company:** **Badger Meter Inc**

5. **Address of Listing Company:** **4545 W Brown Deer Rd,**
   Milwaukee, Wisconsin 53223, USA

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

   3063755 dated 18th April 2018

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

   FM 3810:2018, ANSI/IEC 60529:2004, ANSI/UL 61010-1:2012

8. 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.

9. Equipment Ratings:

   Electrically Safe for use in ordinary (non-hazardous) locations, indoor and outdoor, IP66.

10. **Description of Equipment:**

    General – The TFX-500w Clamp-On Flow Meters are used to measure flow parameters of process fluids. They employ two transducers that clamp on to the outside of a pipe and never directly contact the fluids. The transducers are available with the flow meter or as remote options, and they function as both ultrasonic transmitters and receivers. The flow meters are available for applications with fixed pipe sizes as well as adjustable pipe sizes, depending on the transducer type employed. The flow meters operate by alternately transmitting and receiving a frequency-modulated burst of sound energy between the two transducers. The burst is first transmitted in the direction of fluid flow and then against fluid flow. Since sound energy in a moving liquid is carried faster when it travels in the direction of fluid flow (downstream) than it does when it travels against fluid flow (upstream), a difference in the times of flight will occur. The sound's time-of-flight is accurately measured in

Certificate issued by:

J.E. Marquedant

J.E. Marquedant
VP, Manager - Electrical Systems

3 March 2024

Date

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

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both directions and the difference in time-of-flight is calculated. The difference in time-of-flight calculation, or "transit time", is used to determine flow process dimensions and this is communicated as an electrical signal.

Construction – The flow meters consist of a tool-secured grey plastic enclosure with a built-in keypad and display on the front, an integral mounting plate on the back, and three circular entries on the bottom for wiring purposes. The wiring entries provide electrical connection means for supply and signal power as well as transducer connections. The wiring entries must be occupied or plugged and sealed using suitably rated panel connectors and/or cable fittings in order to maintain an IP66 rating. The enclosure base is secured to the cover holding the keypad and display with four metal fasteners. The mounting plate is secured to the enclosure base with a metal wingnut that is accessible only from the inside of the enclosure. The seams between the enclosure base and cover as well as the enclosure base and mounting plate are gasketed, and the cover display is also sealed with adhesive, for environmental protection.

Ratings – The operating temperature range of the flow meters is -20°C to 60°C for models with display and -40°C to 70°C for models without display. The flow meters are rated for input voltages of 9…28 VDC, 5 Watts maximum.

See Annex for Model Codes.

11. **Specific Conditions of Use:**

    None.

12. **Test and Assessment Procedure and Conditions:**

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

13. **Schedule Drawings**

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

14. **Certificate History**

    Details of the supplements to this certificate are described below:

Date	Description
18 April 2018	Original Issue.
6 March 2019	Supplement 1: Report Reference: RR217780 dated 6th March 2019. Description of the Change: Updates to the documentation, and model code updates.
12 February 2021	Supplement 2: Report Reference: PR458351 dated 12th February 2021. Description of the Change: Changed gasket material.

SCHEDULE

to US Certificate Of Conformity No: FM18NUS0003

Date	Description
3 March 2024	Supplement 3: Report Reference: RR240441 dated 3 March 2024. Description of the Change(s): 1. Update to address component availability. 2. Update to User Manual. 3. Added model code options and End Point Wiring Method. 4. Updated to new certificate format.

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ANNEX

TFX-500w DW-G-a-b-c-d-e-f-g-h. Fixed Pipe Size Clamp-On Flow Meter

Description of Equipment:

TFX-500w DW-G-a-b-c-d-e-f-g-h. Fixed Pipe Size Clamp-On Flow Meter
a = Transducer Type: CA, CB, CC, CD, CE, CF, CG, CH, CT, CJ, CK, CL, CM, CN, CP, CQ, CR or CS.
b = Transmitter Type: E or F.
c = Display: S or W.
d = Remote Cable Length: WW, AC, AF, AK, AR or BW.
e = Conduit Type and Length: WW, AC, AF, AK, AR or BW.
f = Endpoint Wiring Method: XX, TF, TH, TJ, TK, NG or NJ
g = Units of Measure: Totalizer/Flow Rate: 1, A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, T, U or Z
h = Testing & Tagging: F, S or X

TFX-500w DW-G-a-F-b-c-d-S-e-f. Adjustable Pipe Size Clamp-On Flow Meter

Description of Equipment:

TFX-500w DW-G-a-F-b-c-d-S-e-f. Adjustable Pipe Size Clamp-On Flow Meter
a = Transducer Type: NZ, WZ, RZ, UZ, JZ or KZ.
b = Display: S or W.
c = Remote Cable Length: AC, AF, AK, AR, BW, BK, DW, DK or EW.
d = Conduit Type and Length: WW, AC, AF, AK, AR, BW, BK, DW, DK or EW.
e = Units of Measure Totalizer/Flow Rate: G, B, T, H, F, J, N, P, Q, M or A.
f = Testing & Tagging: F or S.

TFX-500w DW-G-a-Z-X-b-c-S-X-F. Remote Transducer

Description of Equipment:

TFX-500w DW-G-a-Z-X-b-c-S-X-F. Remote Transducer
a = Transducer Type: CA, CB, CC, CD, CE, CF, CG, CH, CT, CJ, CK, CL, CM, CN, CP, CQ, CR, CS, NZ, WZ, RZ, UZ, JZ or KZ.
b = Remote Cable Length: AC, AF, AK, AR, BW, BK, DW, DK or EW.
c = Conduit Type and Length: WW, AC, AF, AK, AR, BW, BK, DW, DK or EW.