CERTIFICATE OF CONFORMITY



- 1. HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS
- 2. Certificate No:

4.

5.

3. Equipment: (Type Reference and Name)

Name of Listing Company:

FM17US0208X

MEMOSENS SE5**, SE6** and SE7**Sensors

Knick Elektronische Messgeräte GmbH & Co. KG

Address of Listing Company:

Beuckestrasse 22 Berlin 14163 Germany

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

3061513 dated 5th July 2018

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

FM Class 3600:2018, FM Class 3610:2018, FM Class 3611:2018, FM Class 3810:2018, ANSI/ISA 60079-0:2009, ANSI/ISA-12.12.01:2015, ANSI/ISA 60079-11:2014

- 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.
- 10. Equipment Ratings:

Intrinsically Safe for Class I, Division 1, Groups A, B, C and D; Class I, Zone 0, 1, 2, AEx ia IIC and Nonincendive for Class I, Division 2, Groups A, B, C, and D when installed with nonincendive field parameters hazardous classified locations, indoors and outdoors with an ambient temperature rating of -20°C to +70°C.

Certificate issued by:

anverdin

J. **E**. Marquedant Vice President, Manager, Electrical Systems 27 May 2019 Date

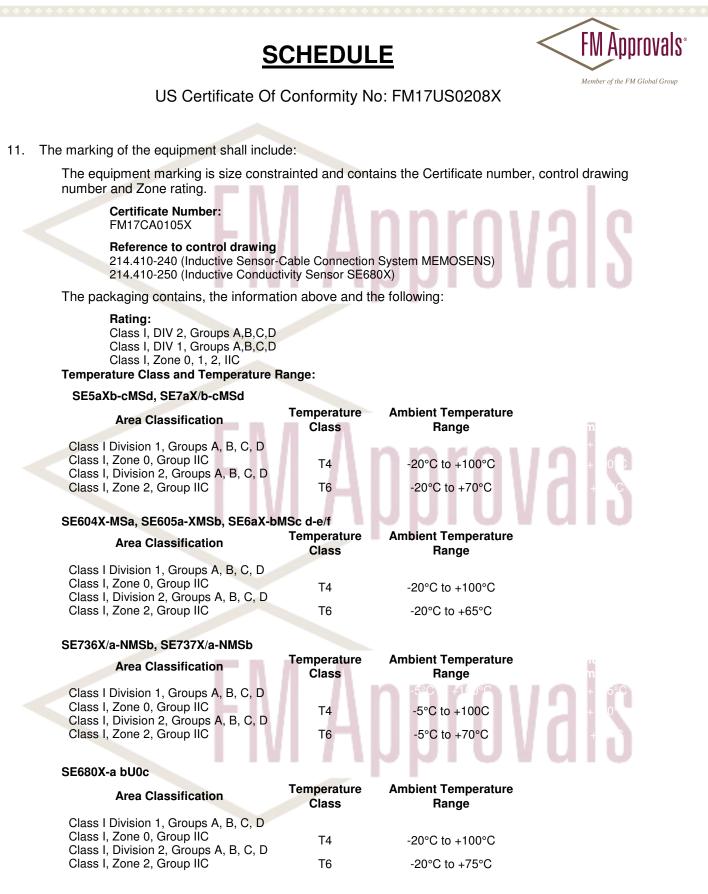
To verify the availability of the Approved product, please refer to www.approvalguide.com

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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: <u>information@fmapprovals.com</u> <u>www.fmapprovals.com</u>

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12. **Description of Equipment:**

General - The MEMOSENS sensors are Digital Sensors families for pH/redox & temperature (SE5) conductivity & temperature (SE6) and oxygen & temperature (SE7) measurements.

The MEMOSENS Sensors are used in connection with a MEMOSENS measuring cables to measure different parameters of fluid media

The intrinsically safe inductive conductivity sensor type SE680X is equipped with an integrated PT1000 temperature probe and used for measurement of solutions with high conductivity and temperatures for different media.

Construction - The electronic components of the intrinsically safe sensors are completely encapsulated.

Ratings - The MEMOSENS Sensors must be used with a MEMOSENS cable CA/MS-aXb, CA/MS-aXb-L or an approved cable type identical in hardware and function.

The MEMOSENS cable can be connected to a transmitter with an intrinsically safe output with $V_0 \le V_{Omax}$, $I_0 \le I_{Omax}$, $P_0 \le P_{Omax}$, $C_i \le C_{imax}$, $L_i \le L_{imax}$ like the approved Knick Memosens transmitters for hazardous locations from the Protos, Stratos or Portavo series.

Transmitter entity parameters are as follows (linear output characteristic):

V _{Omax}	IOmax	Pomax	Cimax	Limax	
5.1 V	130 mA	166 mW	15 µF	95 µH	
Transmitter ent	ity parameters are a	s follows (trapezoid ou	tput characteristic):		
V _{Omax}	IOmax	Pomax	Cimax	Limax	
5.04 V	80 mA	112 mW	14.1 µF	237.2 µH	

The digital sensor SE680X can be connected to a transmitter with an intrinsically safe output with $V_0 \le V_i$, $I_0 \le I_i$, $P_0 \le P_i$, $C_0 \le C_i$, $L_0 \le L_i$ like the approved Knick Memosens transmitters for hazardous locations from the Protos, Stratos or Portavo series.

The entity parameters of the digital sensor SE680X are as follows (linear output characteristic):

Vi	li	Pi	Ci	Li
5.1 V	130 mA	166 mW	55 µF	negligibly small
Thermal Ratin MEMOSENS CA/MS-aXb	Cable Type	Temperature C T4		ent Temperature Range C ≤ T _a ≤ +100 °C
a, b = Not safety related; Any		Т6	-15 °C	C ≤ T _a ≤ +70 °C
CA/MS-aXb-I a, b = Not sa	fety related; Any	Т6	-10 °C	C ≤ T _a ≤ +50 °C

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SE5aXb-cMSd a, b, c, d = Not safety related; Any SE7aX/b-cMSd a, b, c, d = Not safety related; Any Area Classification	Temperature Class	Ambient Temperature Range	Maximum Process Temperature
Class I Division 1, Groups A, B, C, D Class I, Zone 0, Group IIC Class I, Division 2, Groups A, B, C, D Class I, Zone 2, Group IIC	T3 T4 T6	-20°C to +100°C -20°C to +100°C -20°C to +70°C	+135°C +120°C +70°C
SE604X-MSa a = Not safety related; Any SE605a-XMSb a, b = Not safety related; Any SE6aX-bMSc-d/e a, b, c, d, e = Not safety related; Any			
Area Classification	Temperature Class	Ambient Temperature Range	Maximum Process Temperature
Class I Division 1, Groups A, B, C, D Class I, Zone 0, Group IIC Class I, Division 2, Groups A, B, C, D Class I, Zone 2, Group IIC	T3 T4 T6	-20°C to +100°C -20°C to +100°C -20°C to +65°C	+135°C +115°C +65°C
SE736X/*-NMS*, SE737X/*-NMS*	Temperature	Ambient Temperature	Maximum Process
Area Classification	Class	Range	Temperature
Class I Division 1, Groups A, B, C, D Class I, Zone 0, Group IIC	Т3	-5°C to +100°C	+135°C
Class I, Division 2, Groups A, B, C, D	T4	-5°C to +100C	+120°C
Class I, Zone 2, Group IIC	Т6	-5°C to +70°C	+70°C
SE680X-a bU0c a, b = Not safety related; Any			
Area Classification	Temperature Class	Ambient Temperature Range	Maximum Process Temperature
Class I Division 1, Groups A, B, C, D Class I, Zone 0, Group IIC Class I, Division 2, Groups A, B, C, D Class I, Zone 2, Group IIC	T3 T4 T6	-20°C to +100°C -20°C to +100°C -20°C to +75°C	+150°C +125°C +75°C
		IN NIIV	IUTU

13. Specific Conditions of Use:

- 1. All metallic process connections must be bonded as required per the Canadian Electrical Code with electrostatically conductive(< 1 MΩ).
- 2. For the sensor type SE680X, SE604X-MSa, SE605a-XMSb, SE6aX-bMSc d-e/f and SE7aX/b-cMSd may only be used in liquid media with a conductivity of at least 10 nS/cm.
- 3. The sensors may not be operated in electrostatically critical processing conditions. Intense vapour or

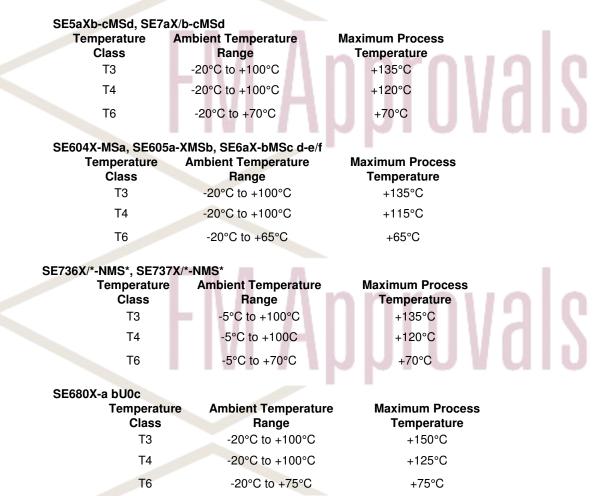
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dust flows directly impacting on the connection system must be avoided. 4. The sensors may be used in the following process temperature range:



- 5. The Memosens sensors SE5aXb-cMSd, SE604X-MSa, SE605a-XMSb, SE6aX-bMSc d-e/f and SE7aX/b-cMSd must be connected to a transmitter with an intrinsically safe output that provides output parameters equal to those defined on control drawing 214.410-240 and must be used in accordance with the requirements and limitations specified on control drawing.
- 6. The SE680X sensors must be connected to a transmitter with an intrinsically safe output that provides output parameters equal to those defined on control drawing 214.410-250 and must be used in accordance with the requirements and limitations specified on control drawing.

14. Test and Assessment Procedure and Conditions:

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

15. Schedule Drawings

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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	
5 th July 2018	Original Issue.	
27 th May 2019	Supplement 1: Report Reference: - RR217822 Dated 27th May 2019 Description of the Change: Corrected SE680X Description error	

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