CERTIFICATE OF CONFORMITY

1. **HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS**
2. **Certificate No:** **FM16CA0008X**
3. **Equipment:** **Proservo NMS80, NMS81 and NMS83**
   (Type Reference and Name)
4. **Name of Listing Company:** **Endress+Hauser Yamanashi Co., Ltd.**
5. **Address of Listing Company:** **862-1 Mitsukunugi Sakaigawa-cho**
   Fuefuki-shi Yamanashi-Ken
   406-0846
   Japan
6. The examination and test results are recorded in confidential report number:

   3057749 dated 2nd August 2016

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

   CSA C22.2 No. 0: 2015, CSA C22.2 No. 0.4: 2013, CSA C22.2 No. 0.5: 2012, CSA C22.2 No. 30: 2012, CSA C22.2 No. 94.2: 2012, CSA C22.2 No. 213: 2017, CAN/CSA C22.2 No. 60529: 2015, CAN/CSA C22.2 No. 60079-0: 2015, CAN/CSA C22.2 No. 60079-1: 2016, CAN/CSA C22.2 No. 60079-11: 2014, CAN/CSA C22.2 No. 60079-26: 2016, CAN/CSA C22.2 No. 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.

Certificate issued by:

J. E. Marquedant
VP, Manager - Electrical Systems

13 July 2020
Date

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

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SCHEDULE

Canadian Certificate Of Conformity No: FM16CA0008X

10. Equipment Ratings:

Explosionproof for Class I, Division 1, Groups B, C, D, T6…T1, providing Intrinsically Safe Connections to Class I, II, III, Division 1, Groups A, B, C, D, E, F, G or Nonincendive Field Wiring Connections to Class I, II, III, Division 2, Groups A, B, C, D, E, F, G; Flameproof for Class I, Zone 1, Group IIC T6…T1, providing Intrinsically Safe Connections to Class I, Zone 0, Group IIC Hazardous Locations.

11. The marking of the equipment shall include:

Cl I Div 1, GP B, C, D T6…T1 Ta*

AIS CL I, II, III DIV 1 GP ABCDEFG

ANI CL I,II,III DIV 2 GP ABCDEFG

CL I Zn 0/1 Ex db [ia Ga] IIC T6…T1 Ga/Gb Ta*

Type 4X,6P, IP66/68

Ta* = -40ºC to +60ºC

Entity and NIFW Parameters – refer to drawing XA01496G-A

Ta* – refer to description section below.

12. **Description of Equipment:**

General - The intelligent tank gauge Proservo NMS8x is designed for high accuracy liquid level measurement in storage and process applications. It is installed on a liquid storage tank which contains liquids such as petroleum, liquefied gases and other liquids used in the chemical industry.

The Proservo NMS8x is designed for the purpose of single or multi-task installations, covering wide range of measurement functions. It is based on the principle of displaced measurement. A displacer is accurately positioned in the liquid medium using a stepper motor. The displacer is suspended on a measuring wire which is wound onto a finely grooved drum housing within the instrument. The drum is driven via coupling magnets which are completely separated by the drum housing.

Construction - he NMS8x assembly comprises a cover, display, electronics assembly, sensor assembly unit, tube housing, lock washer, drum housing, displacer, wire drum, bracket and a drum cover. The enclosure compartments, one being the electronics compartment and the other being the drum compartment. The electronics compartment is an explosionproof/flameproof enclosure which consists of a main body (Housing NMS), a cover with window (window cover) and a separation wall towards the drum housing. It is the separation wall which separates the explosionproof/flameproof enclosure from the drum compartment and its thickness is equal to or greater than 3 mm. The separation wall has no through-bore.

The wire drum is driven by magnet coupling. The power for the rotating electronics (detector circuit with inner magnet) is transmitted through a rotary transformer. NMS8x has no rotary mechanical contacts for power and signal, therefore no sparking by moving mechanical contacts.

The drum housing and tube housings are available in Aluminum and Stainless Steel. Seven cable entries [M20 X 1.5 6H] with an axial length greater than 15 mm are provided on the NMS housing. Terminals for protective earth connection and for potential equilibrium bonding are provided in both terminal compartments as well as outside the enclosure.

SCHEDULE

Canadian Certificate Of Conformity No: FM16CA0008X

Ratings – The Proservo NMS8x operates at 85-264Vac, 52-75Vac and 19-64Vdc (28.8Volt-Amperes). The Temperature rating and ambient operating temperature range of the NMS8x with respect to the process temperature range is below:

Temperature Class	Ambient temperature	Process temperature (temperature of the displacer)
T1	-40°C ≤ Ta ≤ +60°C	-253°C≤Tprocess≤+450°C
T2	-40°C ≤ Ta ≤ +55°C	-253°C≤Tprocess≤+300°C
T3	-40°C ≤ Ta ≤ +50°C	-253°C≤Tprocess≤+200°C
T4		-253°C≤Tprocess≤+135°C
T5		-253°C≤Tprocess≤+100°C
T6		-253°C≤Tprocess≤+85°C

Proservo NMS80-aabcddeeffgghijjkkkllmmmnnn + (options)

aa	**Approval**: FD - FM C/US I / 1 B-D T6...T1.AIS I / 1 A-G, AEx db [ia] IIC T6…T1
b	**Terminal Type:** 1 - Spring Terminals 2 - Screw Terminals 9 - Special version, TSP-no. to be spec. (not relevant for safety)
c	**Power Supply:** B - 85-264VAC, LCD + operation D - 52-75VAC, LCD + operation E - 19-64VDC, LCD + operation
dd	**Primary Output:** A1 - Modbus – RS485 B1 - V1 C1 - WM550 E1 - 4-20mA HART Exd G1 - Wireless H1 - 4-20mA HART Ex i Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
ee	**Secondary I/O Analog:** A1 - Ex d – 1 x 4-20mA HART; 1 x RTD Input A2 - Ex d – 2 x 4-20mA HART; 2 x RTD Input B1 - Ex i – 1 x 4-20mA HART; 1 x RTD Input B2 - Ex i – 2 x 4-20mA HART; 2 x RTD Input C2 - Ex i – 1 x 4-20mA HART; 2 x RTD Input + 1 x Ex d 4-20mA HART X0 - Prepared for I/O Analog RTD input Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
ff	**Secondary I/O Digital Ex d:** A1 - 2 x relay + 2 x module discrete A2 - 4 x relay + 4 x module discrete A3 - 6 x relay + 6 x module discrete B1 - Modbus RS485 B2 - Modbus RS485 + 2 x relay + 2 x module discrete B3 - Modbus RS485 + 4 x relay + 4 x module discrete E1 - W550

SCHEDULE

Canadian Certificate Of Conformity No: FM16CA0008X

	E2 - W550 + 2 x relay + 2 x module discrete E3 - W550 + 4 x relay + 4 x module discrete X0 - Prepared for I/O digital Ex d Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
gg	**Housing:** AB - Transmitter + process Alu, coated
h	**Process Pressure:** 1 - 0… 0.2 bar/20 kPa/2.9 psi 2 - 0… 6 bar/600 kPa/87 psi 9 - Special version, TSP-no. to be spec.
i	**Electrical Connection:** A - Thread M20, IP66/68, NEMA Type 4X/6P Encl. B - Thread M25, IP66/68, NEMA Type 4X/6P Encl. E - Thread NPT1/2", IP66/68, NEMA Type 4X/6P Encl. F - Thread NPT3/4", IP66/68, NEMA Type 4X/6P Encl.
jj	**Measuring range; Wire; Diameter:** A3 - 16 m; PFA>316L; 0.4 mm C2 - 22 m; Alloy C276; 0.2 mm D1 - 28 m; 316L; 0.15 mm F1 - 36 m; 316L; 0.15 mm Y9 - Special version, TSP-no. to be spec.
kkk	**Displacer Material; Type:** 1AA - 316L; 30 mm cylindrical 1AC - 316L; 30 mm cylindrical 1BE - 316L; 70 mm conical 1BJ - 316L; 110 mm conical 2AA - PTFE; 30 mm cylindrical 2AC - PTFE; 50 mm cylindrical 3AC - Alloy C276; 50 mm cylindrical 9YY - Special version, TSP-no. to be spec.
ll	**Process Sealing;** A1 - HNBR -30°C…150°C/ -22°F…302°F B1 - FKM GLT, -40°C…200ºC / -40°F…392ºF B2 - FFKM GLT, -20°C…200ºC / -4°F…392ºF C1 - CR Chloropren -30°C…80°C / -40°F …176°F D1 - PTFE (wire drum FKM) -100°C …150°C/ -148°F…302°F E1 - VMQ Silicone -40°C…200°C/ -40°F…392°F YY - Special version, TSP-no. to be spec.
mmm	**Process Connection:** Any 3 characters combinations (not relevant for safety)
nnn	**Accuracy, Weight + Measure Approval:** Any 3 characters combinations (not relevant for safety)
(options)	**Options:** not relevant for safety

Proservo NMS81-aabcddeeffgghijjkkkllmmmnnn + (options)

aa	**Approval**: FD - FM C/US I / 1 B-D T6...T1.AIS I / 1 A-G, AEx db [ia] IIC T6…T1
b	**Terminal Type:**

SCHEDULE

Canadian Certificate Of Conformity No: FM16CA0008X

	1 - Spring Terminals 2 - Screw Terminals 9 - Special version, TSP-no. to be spec. (not relevant for safety)
c	**Power Supply:** B - 85-264VAC, LCD + operation D - 52-75VAC, LCD + operation E - 19-64VDC, LCD + operation
dd	**Primary Output:** A1 - Modbus – RS485 B1 - V1 C1 - WM550 E1 - 4-20mA HART Exd G1 - Wireless H1 - 4-20mA HART Ex i Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
ee	**Secondary I/O Analog:** A1 - Ex d – 1 x 4-20mA HART; 1 x RTD Input A2 - Ex d – 2 x 4-20mA HART; 2 x RTD Input B1 - Ex i – 1 x 4-20mA HART; 1 x RTD Input B2 - Ex i – 2 x 4-20mA HART; 2 x RTD Input C2 - Ex i – 1 x 4-20mA HART; 2 x RTD Input + 1 x Ex d 4-20mA HART X0 - Prepared for I/O Analog RTD input Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
ff	**Secondary I/O Digital Ex d:** A1 - 2 x relay + 2 x module discrete A2 - 4 x relay + 4 x module discrete A3 - 6 x relay + 6 x module discrete B1 - Modbus RS485 B2 - Modbus RS485 + 2 x relay + 2 x module discrete B3 - Modbus RS485 + 4 x relay + 4 x module discrete E1 - W550 E2 - W550 + 2 x relay + 2 x module discrete E3 - W550 + 4 x relay + 4 x module discrete X0 - Prepared for I/O digital Ex d Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
gg	**Housing:** AC - Transmitter Alu coated + process 316/316L AD - Transmitter Alu coated, process 316/316L internal FEP coated BC - Transmitter + process 316/316L BD - Transmitter 316/316L, Process 316/316L internal FEP coated
h	**Process Pressure:** 1 - 0… 0.2 bar/20 kPa/2.9 psi 2 - 0… 6 bar/600 kPa/87 psi 3 - 0… 25 bar/2.5 MPa/362 psi 9 - Special version, TSP-no. to be spec.
i	**Electrical Connection:** A - Thread M20, IP66/68, NEMA Type 4X/6P Encl. B - Thread M25, IP66/68, NEMA Type 4X/6P Encl.

SCHEDULE

Canadian Certificate Of Conformity No: FM16CA0008X

	E - Thread NPT1/2", IP66/68, NEMA Type 4X/6P Encl. F - Thread NPT3/4", IP66/68, NEMA Type 4X/6P Encl.
jj	**Measuring range; Wire; Diameter:** A3 - 16 m; PFA>316L; 0.4 mm C2 - 22 m; Alloy C276; 0.2 mm D1 - 28 m; 316L; 0.15 mm F1 - 36 m; 316L; 0.15 mm G1 - 47 m; 316L; 0.15 mm H1 - 55 m; 316L; 0.15 mm Y9 - Special version, TSP-no. to be spec.
kkk	**Displacer Material; Type:** 1AA - 316L; 30 mm cylindrical 1AC - 316L; 30 mm cylindrical 1BE - 316L; 70 mm conical 1BJ - 316L; 110 mm conical 2AA - PTFE; 30 mm cylindrical 2AC - PTFE; 50 mm cylindrical 3AC - Alloy C276; 50 mm cylindrical 9YY - Special version, TSP-no. to be spec.
ll	**Process Sealing;** A1 - HNBR -30°C…150°C/ -22°F…302°F B1 - FKM GLT, -40°C…200ºC / -40°F…392ºF B2 - FFKM GLT -20°C…200ºC / -4°F…392ºF C1 - CR Chloropren -30°C…80°C / -40°F …176°F D1 - PTFE (wire drum FKM) -100°C …150°C/ -148°F…302°F E1 - VMQ Silicone -40°C…200°C/ -40°F…392°F YY - Special version, TSP-no. to be spec.
mmm	**Process Connection:** Any 3 characters combinations (not relevant for safety)
nnn	**Accuracy, Weight + Measure Approval:** Any 3 characters combinations (not relevant for safety)
(options)	**Options:** not relevant for safety

Proservo NMS83-aabcddeeffgghijjkkkllmmmnnn + (options)

aa	**Approval**: FD - FM C/US I / 1 B-D T6...T1.AIS I / 1 A-G, AEx db [ia] IIC T6…T1
b	**Terminal Type:** 1 - Spring Terminals 2 - Screw Terminals 9 - Special version, TSP-no. to be spec. (not relevant for safety)
c	**Power Supply:** B - 85-264VAC, LCD + operation D - 52-75VAC, LCD + operation E - 19-64VDC, LCD + operation
dd	**Primary Output:** A1 - Modbus – RS485 B1 - V1 C1 - WM550

SCHEDULE

Canadian Certificate Of Conformity No: FM16CA0008X

	E1 - 4-20mA HART Exd G1 - Wireless H1 - 4-20mA HART Ex i Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
ee	**Secondary I/O Analog:** A1 - Ex d – 1 x 4-20mA HART; 1 x RTD Input A2 - Ex d – 2 x 4-20mA HART; 2 x RTD Input B1 - Ex i – 1 x 4-20mA HART; 1 x RTD Input B2 - Ex i – 2 x 4-20mA HART; 2 x RTD Input C2 - Ex i – 1 x 4-20mA HART; 2 x RTD Input + 1 x Ex d 4-20mA HART X0 - Prepared for I/O Analog RTD input Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
ff	**Secondary I/O Digital Ex d:** A1 - 2 x relay + 2 x module discrete A2 - 4 x relay + 4 x module discrete A3 - 6 x relay + 6 x module discrete B1 - Modbus RS485 B2 - Modbus RS485 + 2 x relay + 2 x module discrete B3 - Modbus RS485 + 4 x relay + 4 x module discrete E1 - W550 E2 - W550 + 2 x relay + 2 x module discrete E3 - W550 + 4 x relay + 4 x module discrete X0 - Prepared for I/O digital Ex d Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
gg	**Housing:** AC - Transmitter Alu coated + process 316/316L BC - Transmitter + process 316/316L BD - Transmitter 316/316L, Process 316/316L internal FEP coated Y9 - Special version, TSP-no. to be spec. (not relevant for safety)
h	**Process Pressure:** 2 - 0… 6 bar/600 kPa/87 psi 9 - Special version, TSP-no. to be spec.
i	**Electrical Connection:** A - Thread M20, IP66/68, NEMA Type 4X/6P Encl. B - Thread M25, IP66/68, NEMA Type 4X/6P Encl. E - Thread NPT1/2”, IP66/68, NEMA Type 4X/6P Encl. F - Thread NPT3/4”, IP66/68, NEMA Type 4X/6P Encl.
jj	**Measuring range; Wire; Diameter:** A3 - 16 m; PFA>316L; 0.4 mm C2 - 22 m; Alloy C276; 0.2 mm Y9 - Special version, TSP-no. to be spec.
kkk	**Displacer Material; Type:** 4AC - 316L polished; 50 mm cylindrical 4AE - 316L polished; 70 mm cylindrical 5AC - PTFE; 50 mm cylindrical, hygienic white 9YY - Special version, TSP-no. to be spec.
ll	**Process Sealing;** A1 - HNBR -30°C…150°C/ -22°F…302°F

	B1 - FKM, GLT -40°C…200ºC / -40°F…392ºF B2 - FFKM GLT -20°C…200ºC / -4°F…392ºF C1 - CR Chloropren -30°C…80°C / -40°F …176°F D1 - PTFE (wire drum FKM) -100°C …150°C/ -148°F…302°F E1 - VMQ Silicone -40°C…200°C/ -40°F…392°F YY - Special version, TSP-no. to be spec.
mmm	**Process Connection:** Any 3 characters combinations (not relevant for safety)
nnn	**Accuracy, Weight + Measure Approval:** Any 3 characters combinations (not relevant for safety)
(options)	**Options:** not relevant for safety

13. **Specific Conditions of Use:**

1. For Ambient and Process Temperature Range refer to drawing XA01496G-A.
2. Flamepath joints are not for repair. Contact the manufacturer.
3. Use heat resisting cables rated ≥ 85°C for Ta > 50°C.
4. Precautions shall be taken to minimize the risk from electrostatic discharge of non-metallic labels and isolated metal tags applied to the enclosure.
5. To maintain the ingress protection ratings (IP66/68), Teflon tape or pipe dope is required for blanking plugs.
6. Explosionproof certified seals are required within 450 mm (18") for Group B, C, D and within 50mm (2") for Group IIC on all used housing entries.

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

This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

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
2nd August 2016	Original Issue.
6th September 2016	Supplement 1: Report reference: RR206287 dated 6th September 2016. Description of change: Minor edits to the certificate in terms of address, conditions of use and options.
1st May 2018	Supplement 2: Report reference: RR213288 dated 1st May 2018. Description of change: Documentaton update to include Stainless Steel Tube Housing for NMS83 and minor edits to the certificate.

SCHEDULE

Canadian Certificate Of Conformity No: FM16CA0008X

4th October 2019	Supplement 3: Report reference: RR220154 dated 4th october 2019 . Description of change: Update technical documents, update Temperature Class Table in Technical Documentation and within this Certiicate and update Ambient Temperature Range in this certificate.
13th July 2020	Supplement 4: Report reference: RR223893 dated 13th July 2020. Description of change: 1) Removal of CSA C22.2 No. 157: 2012 from the Assessment Standards list 2) Update of CSA C22.2 No. 213 to the latest edition (2017) 3) Model code amendments due to power supply updates