# Certificate of Compliance

| | | | |
|---|---|---|---|
| **Certificate:** | 80021719 | **Master Contract:** | 205557 |
| **Project:** | 80169522 | **Date Issued:** | Aug 30, 2023 |

**Issued To:** **Endress+Hauser Conducta GmbH & Co. KG**
**Dieselstraße 24**
**Gerlingen, Baden-Württemberg, 70839**
**Germany**

**Attention: Marco Rottmann**

***The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.***

**Issued by:** Awais Hameed

**PRODUCTS**

CLASS - C225804 - PROCESS CONTROL EQUIPMENT Intrinsically Safe, Entity - For Hazardous Locations
CLASS - C225884 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations - Certified to US Standards

**Ex ia IIC T6…T4 Ga**
**Class I, Zone 0 AEx ia IIC T6…T4 Ga**
**IS Class I, Division 1, Groups A, B, C and D T6…T4**

Inductive sensor-cable connection system MEMOSENS, consisting of a sensor and the measuring cable type xYK10 or type xYK20 is used to measure different parameters of fluid media.

The sensors in conjunction with measuring cable xYK10, xYK20 (max. length 100m) may be connected to the intrinsic safe digital sensor module FSDG1 output of CSA certified Liquiline CM42 or equivalent providing the following maximum values as described below. In particular the effective inner inductivity and capacity of the approved, intrinsic safe sensor output may not exceed the values given below. Install per control drawing XA01687C.

| **1. Entity Parameter Set** | **2. Entity Parameter Set** |
|---|---|
| Uo = 5.1 V | Uo = 5.04 V |
| Io = 130 mA | Io = 80 mA |
| Po = 166 mW<br>(linear output characteristic) | Po = 112 mW<br>(trapezoid output characteristic) |
| Ci = 15 µF | Ci = 14.1 µF |
| Li = 95 µH | Li = 237.2 µH |

Furthermore, the connection of power limited Memosens sensors (Pi is defined) to the power limited inductive coupling of measuring cable xYK10 and xYK20 is possible considering of the following value:
Maximum output power $P_o$ = 178 mW (except for sensor type CLS50D).

Digital sensor types are:

- pH/ORP Sensor **xPS##D-abbcdeee+f**
  x = O, C or OC (no ex-relevance)
  ## = 11, 12, 16, 71, 76, 91, 92, 96
  a = Version (no Ex-relevance)
  bb = Application range (no Ex-relevance)
  c = Shaft length, maximum 600 mm (no Ex-relevance)
  d = Approval (no ex-relevance)
  eee = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
  f = one or more characters determining optional features (no Ex-relevance)

- pH/ORP Sensor **xPS72D-abbcdeee+f**
  x = O, C or OC (no ex-relevance)
  a = Version (no Ex-relevance)
  bb = Measuring surface (no Ex-relevance)
  c = Shaft length, maximum 600 mm (no Ex-relevance)
  d = Approval (no ex-relevance)
  eee = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
  f = one or more characters determining optional features (no Ex-relevance)

- pH/ORP Sensor **xPS4#D-abbcdefff+g**
  x = O, C or OC (no ex-relevance)
  # = 1, 2
  a = Version (no Ex-relevance)
  bb = Application range (no Ex-relevance)
  c = Shaft length, maximum 600 mm (no Ex-relevance)

d = Electrolyte supply, no Ex-relevance
e = Approval (no ex-relevance)
fff = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
g = one or more characters determining optional features (no Ex-relevance)

- pH/ORP Sensor **xPF##D-abbcdeee+f**
  x = O, C or OC (no ex-relevance)
  ## = 81, 82
  a = Version (no Ex-relevance)
  bb = Application range (no Ex-relevance)
  c = Insertion length (no Ex-relevance)
  d = Approval (no ex-relevance)
  eee = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
  f = one or more characters determining optional features (no Ex-relevance)

- pH/ORP Sensor **xPS171D-aabcddefff+g**
  x = O, C or OC (no ex-relevance)
  aa = Approval (no ex-relevance)
  b = Electrode type (no Ex-relevance)
  c = Application range (no Ex-relevance)
  dd = Reference system (no Ex-relevance)
  e = Shaft length (no ex-relevance)
  fff = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
  g = one or more characters determining optional features (no Ex-relevance)

- pH ISET sensor type **xPS4x1D-bdegaafff +***
  b = 7, basic version; 8, SIL version, for xPS11D, xPS71D and xPS91D use only
  d = 1 character for shaft length, maximum 600mm (not relevant for safety)
  e = 1 character for electrolyte supply for xPS4xD and xPS441D use only (not relevant for safety)
  g = 1 character for application specified or additional feature (not relevant for safety)
  aa = 1 or 2 character identifier for Approval agency in Hazardous area (CC, C2, G, O, F, BA, 8A etc.)
  fff = 3 character determining OEM label partner (not relevant for safety)
  +* = 1 or more characters for optional features (not relevant for safety)

- Memosens **xLS##D-abbcddd+e**
  x = O, C or OC (no ex-relevance)
  ## = 15, 21
  a = Measuring Range; cell constant (no Ex-relevance)
  bb = Process Connection (no Ex-relevance)
  c = Approval (no Ex-relevance)
  ddd = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
  e = one or more characters determining optional features (no Ex-relevance)

- Memosens **xLS16D-aabbcddd+e**

x = O, C or OC (no ex-relevance)
aa = Process Connection (no Ex-relevance)
bb = Additional Option (no Ex-relevance)
c = Approval (no Ex-relevance)
ddd = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
e = one or more characters determining optional features (no Ex-relevance)

- Memosens **xLS82D-aabbcddd+e**
  x = O, C or OC (no ex-relevance)
  aa = Approval (no Ex-relevance)
  bb = Process Connection (no Ex-relevance)
  c = Sensor Material (shaft material, metal)
  ddd = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
  e = one or more characters determining optional features (no Ex-relevance)

- Memosens **xLS50D-aabcdefff+g**
  x = O, C or OC (no ex-relevance)
  aa = Approval (no Ex-relevance)
  b = Process Connection (no Ex-relevance)
  c = Sensor-, Seal-, Adapter Material
    B = PEEK/ VITON/ PEEK,
    C = PEEK/Chemraz/ PEEK,
    D = PFA/ Chemraz/ 1.4571 material shaft/thread,
    E = PEEK; Viton; 1.4571
  d = Cable length (no Ex-relevance)
  e = Cable connection:
    1 = Fixed cable; crimp sleeves
    2 = Fixed cable; M12-plug
  fff = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
  g = one or more characters determining optional features (no Ex-relevance)

- Oxymax **xOS22D-aabccdefggg+h**
  x = O, C or OC (no ex-relevance)
  aa = Approval (no Ex-relevance)
  b = Application (no Ex-relevance)
  cc = Diameter; process connection; length (no Ex-relevance)
  d = Material shaft sleeve (no Ex-relevance)
  e = Material o-ring (no Ex-relevance)
  f = Material Process Sealing (no Ex-relevance)
  ggg = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
  h = one or more characters determining optional features (no Ex-relevance)

- Oxymax **xOS21D-abcdefff+g**
  X = O, C or OC (no ex-relevance)

a = Application: working range (no Ex-relevance)
b = Sensor length (no Ex-relevance)
c = Approvals (no Ex-relevance)
d = Certificates (no Ex-relevance)
e = Options (no Ex-relevance)
fff = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
g = one or more characters determining optional features (no Ex-relevance)

- Oxymax **xOS51D-abcdefff+g**
  x = O, C or OC (no ex-relevance)
  a = Approval (no Ex-relevance)
  b = Head type (no Ex-relevance)
  c = Cable length (no Ex-relevance)
  d = Membrane cap (no Ex-relevance)
  e = Accessories (no Ex-relevance)
  fff = three characters determining customer version; Only if x = O, OC, (no Ex-relevance)
  g = one or more characters determining optional features (no Ex-relevance)

- Oxymax **xOS81D-aabbcdefggg+h**
  x = O, C or OC (no ex-relevance)
  aa = Approval (no Ex-relevance)
  bb = Diameter; Process Connection; Length (no Ex-relevance)
  c = Type Optical Cap (no Ex-relevance)
  d = Material Sensorshaft; Sensorcap (no Ex-relevance)
  e = Material O-ring
  1 = O-ring material EPDM
  3 = O-ring material FFKM
  9 = other O-ring material e.g. Silicone, temperature range identical to 1
  f = Material Process Sealing
  3 = FKM Ex
  ggg = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
  h = one or more characters determining optional features (no Ex-relevance)

The cable types are:

- Measuring cable **xYK10-abbcddd**
  x = O, C or OC (no ex-relevance)
  a = Approval (no Ex-relevance)
  bb = Cable length; max. 100 m (no Ex-relevance)
  c = Cable connection (no Ex-relevance)
  ddd = three characters determining customer version; Only if x = O, OC (no Ex-relevance)

- Measuring cable **xYK20-aabbccddd**
  x = O, C or OC (no ex-relevance)
  aa = Approval (no Ex-relevance)
  bb = Cable length; max. 100 m (no Ex-relevance)

cc = Cable connection (no Ex-relevance)
ddd = three characters determining customer version; Only if x = O, OC (no Ex-relevance)

| Name | Type | Ambient Temperature | Process Temp. Range |
|---|---|---|---|
| Orbisint pH electrode | xPS11D | 0 °C ≤ Ta ≤ +55 °C (T4) ; 0 °C ≤ Ta ≤ +50 °C (T6) | -15 °C ≤ Tp ≤ +120 °C (T4) ; -15 °C ≤ Tp ≤ +70 °C (T6) |
| Orbisint ORP electrode | xPS12D | | |
| Orbisint pH/ORP electrode | xPS16D | | |
| Ceraliquid pH electrode | xPS41D | | |
| Ceraliquid ORP electrode | xPS42D | | |
| Ceragel ORP electrode | xPS72D | | |
| Tophit | xPS441D, xPS471D | | |
| Tophit | xPS491D | | -15 °C ≤ Tp ≤ +110 °C (T4) ; -15 °C ≤ Tp ≤ +70 °C (T6) |
| Orbipac pH sensor | CPF81D | | 0 °C ≤ Tp ≤ +110 °C (T4) ; 0 °C ≤ Tp ≤ +70 °C (T6) |
| Orbipac ORP sensor | xPF82D | | |
| Ceragel pH electrode | xPS71D | 0 °C ≤ Ta ≤ +55 °C (T4) ; 0 °C ≤ Ta ≤ +50 °C (T6) | 0 °C ≤ Tp ≤ +120 °C (T4) ; 0 °C ≤ Tp ≤ +70 °C (T6) |
| Ceragel pH/ORP electrode | xPS76D | | |
| pH Sensor | xPS171D | | |
| Orbipore pH electrode | xPS91D | | 0 °C ≤ Tp ≤ +110 °C (T4) ; 0 °C ≤ Tp ≤ +70 °C (T6) |
| Orbipore ORP electrode | xPS92D | | |
| Orbipore pH/ORP electrode | xPS96D | | |
| Conductivity sensor | xLS82D | | -20 °C ≤ Tp ≤ +120 °C (T4) ; -20 °C ≤ Tp ≤ +70 °C (T6) |
| Condumax W | CLS15D-A | | |
| Condumax W | CLS15D-B | | -20 °C ≤ Tp ≤ +100 °C (T4) ; -20 °C ≤ Tp ≤ +50 °C (T6) |
| Condumax W | xLS21D-C | | -20 °C ≤ Tp ≤ +115 °C (T4) ; -20 °C ≤ Tp ≤ +65 °C (T6) |

| | | | |
|---|---|---|---|
| Condumax H | CLS16D | | -5 °C ≤ Tp ≤ +115 °C (T4) ; -5 °C ≤ Tp ≤ +65 °C (T6) |
| Indumax | CLS50D-***B<br>CLS50D-***C | | -20 °C ≤ Tp ≤ +120 °C (T4) ; -20 °C ≤ Tp ≤ +70 °C (T6) |
| Indumax | CLS50D-***D | | -20 °C ≤ Tp ≤ +110 °C (T4) ; -20 °C ≤ Tp ≤ +70 °C (T6) |
| Oxymax (H) | COS21D,<br>COS22D | | -5 °C ≤ Tp ≤ +115 °C (T4) ; -5 °C ≤ Tp ≤ +65 °C (T6) |
| Oxymax (W) | COS51D | | -5 °C ≤ Tp ≤ +50 °C (T6) |
| Dissolved Oxygen sensor | xOS81D-*****13,<br>xOS81D-*****93 | | -10 °C ≤ Tp ≤ +120 °C (T4) ; -10 °C ≤ Tp ≤ +70 °C (T6) |
| Dissolved Oxygen sensor | xOS81D-*****33 | | 0 °C ≤ Tp ≤ +120 °C (T4) ; 0 °C ≤ Tp ≤ +70 °C (T6) |
| Measuring Cable | xYK10 | | -15 °C ≤ Tp ≤ +120 °C (T4) ; -15 °C ≤ Tp ≤ +70 °C (T6) |
| Measuring Cable | xYK20 | | -10 °C ≤ Tp ≤ +50 °C (T6) |

Note:
where applicable, prefix “x” = C or O or OC (not Ex relevant)

**Ex ia IIC T6 Gb**
**Class I, Zone 0 AEx ia IIC T6 Gb**
**IS Class I, Division 1, Groups A, B, C and D T6**

Memocheck Plus CYP01D, Memocheck xYP02D in connection with the measuring cable xYK10 serves as a test tool for qualification or checking of transmitters providing Memosens capabilities. The connection between sensor simulator and measuring cable is galvanically isolated via a completely isolated connection system. These simulators are not permanently installed in the field and not in contact with process media. Install per control drawing XA01687C.

The Sensor simulator types are:

- Memocheck **xYP##D-aabcdfff+g**

Order codes:

## = 01, 02
aa = parameter (no Ex-relevance)
b = Version (no Ex-relevance)
c = certificate (no Ex-relevance); Only xYP01D
d = Approval (no Ex-relevance)
fff = three characters determining customer version; Only if x = O, OC (no Ex-relevance)
+g = 1 or more characters for optional features (not relevant for safety)

| Name | Type | Ambient Temperature |
|---|---|---|
| Memocheck Plus | CYP01D | -15 °C ≤ Ta ≤ +70 °C (T6) |
| Memocheck | xYP02D | |

Note:
where applicable, prefix "x" = C or O or OC (not Ex relevant)

**Conditions of Acceptability:**

1. The measuring cable type xYK10 or type xYK20 and its connecting head must be protected from electrostatic charging, if installed through areas of EPL Ga (Zone 0).
2. For the sensors type xPS11D, xPS12D, xPS16D, xPS41D, xPS42D, xPS71D, xPS72D, xPS76D, xPS91D, xPS92D, xPS96D, CYP01D, xYP02D, xPS171D, CPF81D and xPF82D, the sensors may not be operated in electrostatically critical processing conditions. Intense vapor or dust flows directly impacting on the connection system must be avoided.
3. For the sensor type xOS22D, the sensors may not be operated in electrostatically critical processing conditions. Intense vapor or dust flows directly impacting on the connection system must be avoided. The metallic parts of the sensors should be grounded at a mounting location with an impedance of <1MΩ. The

sensor shaft must be effectively protected against mechanical influences such as impacts or mechanical friction.

4. For the sensors type COS51D, xPS441D, xPS471D and xPS491D, the sensors may not be operated on processing conditions, in which an electrostatic loading of the sensor and the connecting system is to be counted. Operation in product application intended fluid media providing conductivity of at least 10 nS/cm can be assumed as electrostatic noncritical.
5. For the sensors type CLS15D-A, CLS15D-B, CLS15D-L, CLS21D and CLS16D, metallic process connection parts should be grounded at a mounting location with an impedance of <1MΩ. The sensors type CLS15D-A, CLS15D-B and CLS15D-L with non-metallic process connection and the sensor type xLS21D may only be used in liquid media with a conductivity of at least 10 nS/cm. The sensors type CLS15D-A, CLS15D-B and CLS15D-L with non-metallic process connection may not be operated on processing conditions, in which an electrostatic loading of the sensor and in particular of the electrically separated outer electrode, could be expected to occur.
6. For the sensor type xLS82D and xOS81D, the sensor may not be operated in electrostatically critical processing conditions. Intense vapor or dust flows directly impacting on the connection system must be avoided. The metallic parts of the sensor should be grounded at a mounting location with an impedance of <1MΩ.
7. The sensors type CLS50D-*****-** may only be used in liquid media with a conductivity of at least 10 nS/cm. Metallic process connection parts should be grounded at a mounting location with an impedance of <1MΩ. Non-metallic process connection parts have to be protected from electrostatic charging. The connection cable shall be protected from electrostatic charging where necessary.
8. Only sensors, intended to be used according to the user instructions, must be connected. The rated values of input and output circuits must be followed.
9. To be supplied by a Class 2 or Limited Energy Source in accordance with CSA 61010-1-12.

## APPLICABLE REQUIREMENTS

| | |
|---|---|
| CAN/CSA-C22.2 No. 61010-1-12 (r2017) | Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements |
| CAN/CSA-C22.2 No. 60079-0:15 | Explosive atmospheres – Part 0: Equipment – General requirements |
| CAN/CSA-C22.2 No. 60079-11:14 | Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” |
| ANSI/UL 61010-1 Third Edition (2016) | Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements |
| ANSI/UL 60079-0 Sixth Edition | Explosive atmospheres – Part 0: Equipment – General requirements |
| ANSI/UL 60079-11 Sixth Edition | Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety “i” |

## MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

## Nameplate adhesive label material approval information:

N/A. No adhesive label used.

Markings are etched directly onto the housing using laser printing similar to other sensors approved under CSA report 70157089 for the same manufacturer.

Refer to drawing # 201622 for the sensors generic name plate example.

The following details shall be provided by manufacturer on nameplate:

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**Project:** 80169522

**Master Contract:** 205557
**Date Issued:** Aug 30, 2023

- Manufacturer's name "Endress + Hauser" or CSA Master Contract Number "205557", adjacent to the CSA Mark in lieu of manufacturer's name.
- The designation "CSA 20CA80021719".
- The CSA Mark, as shown on the Certificate of Conformity.
- Model designation: As specified in the PRODUCTS section, above.
- Electrical ratings: As specified in the PRODUCTS section, above.
- Ambient temperature rating: As specified in the PRODUCTS section, above or control drawings.
- Manufacturing date in MMYY format, or serial number, traceable to year and month of manufacture.
- Hazardous Location designation: As specified in the PRODUCTS section, above.
- Temperature code: As specified in the PRODUCTS section, above.
- The words: "Install per Control Drawing XA01687C", or equivalent.
- ISO 3864 Symbol B.3.1 ⚠ or ISO 7000 symbol 0434 ⚠ (triangle with exclamation point)
- Warning as below both in English and French as applicable for each type of protection method:
  - "WARNING: Substitution of components may impair suitability for hazardous locations."
  - "AVERTISSEMENT: La substitution de composants peut compromettre l'adaptabilité aux emplacements dangereux."

Notes:

Products certified under Class C225804, C225884 have been certified under CSA's ISO/IEC 17065 accreditation with the Standards Council of Canada (SCC). www.scc.ca

# *Supplement to Certificate of Compliance*

**Certificate:** 80021719 **Master Contract:** 205557

***The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.***

## Product Certification History

| Project | Date | Description |
|---|---|---|
| 80169522 | 2023-08-30 | Update to report 80021719 to introduce the following variations:<br>i. Clarification of Sensor model codes<br>ii. Updating of the document CLS5XD |
| 80063052 | 2021-01-21 | Update of cCSAus report 80021719 for intrinsically safe digital sensor models used with CM42 transmitter to update product nameplates to address FIR (Factory ID 4925117, Trip Number DEU09Q2, date Aug.11, 2020) finding. Certificate number CSA 20CA80021719 and reference for installation drawing “XA01687C” missing from Nameplate. |
| 80021719 | 2020-03-23 | Issue a separate cCSAus prime report for digital sensor models used with CM42 transmitter, previously certified under CSA report 1718339. The I.S. Assessment is primarily based on IECEx issued by Dekra. The digital sensors protection method is Ex ia T4/T6 Ga, and the sensor simulators CYP01D, CYP02D are Ex ia T6 Gb. |