



Certificate of Compliance

Certificate: 1718339

Master Contract: 205557

Project: 80123509

Date Issued: 2023-06-01

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

Issued by: Sorin Tat
Sorin Tat



PRODUCTS

CLASS - C225803 - PROCESS CONTROL EQUIPMENT Intrinsically Safe and Non-incendive - For Hazardous Locations

Class I, Division 2, Groups A, B, C and D; Type 4, IP66/67:

- Liquiline, type CM42-aSbcdefgh two-wire transmitter for liquid analysis, rated 30 Vdc, 4-20mA; temperature code T4/T6, maximum ambient 55°C/50°C respectively. Non-incendive field wiring circuits when installed per connection drawing 139711/ XA01687C.
- Liquiline, type CM42-aRbcdefgh two-wire transmitter for liquid analysis, rated 30 Vdc, 4-20mA/HART output; NIFW (suffix c= 0 or 1) and Profibus/Foundation Fieldbus output with FISCO Entity (suffix c= 2, 3, 5 or 6) for Non-incendive field wiring circuits when installed per connection drawing 139711/ XA01687C; temperature code T4/T6, maximum ambient 55°C/50°C respectively.

Suffixes in the type number can be the following:



Certificate: 1718339
Project: 80123509

Master Contract: 205557
Date Issued: 2023-06-01

a = A, C, I, K, L, M, N, O, P or R (denotes sensor input);
b = 1 letter code (denotes Certificate type);
c = 0,1,2,3,5,6 (denotes output type);
d = 0 (plastic housing) or 1 (stainless steel housing);
e = 1 letter code (denotes cable entry);
f = 2 letter code (denotes software);
g = 1 letter code (denotes device language);
h = 1 letter code (denotes documentation).

• **Analog Sensors**

Inductive conductivity sensors: CLS50, CLS54
Conducted conductivity sensors: CLS12, CLS13, CLS15, CLS16, CLS21
pH IsFET sensors: CPS441, CPS471, CPS491
pH Sensors: CPS11, CPS13, CPS41, CPS71, CPS91, CPF81
ORP sensors: CPS12, CPS42, CPS72, CPS92, CPF82
Temperature sensors: CTS1

Non-incendive field wiring circuits when installed per connection drawing 139711.

Conditions of Acceptability:

-The Liquiline M model CM42 shall be powered with max. 30Vdc (32Vdc for PA/FF) from a limited energy source with a maximum available current of 8 A, which is separated from hazardous live by double or reinforced insulation at the source of the supply.

-The CM42 transmitter is suitable for connection with the following sensors:

- **Digital Sensors that match the electrical parameters of CM42 transmitter outputs with the following entity parameters:**

At Terminals: 187-188, 197-198

Maximum output voltage	Uo	5.04 V
Maximum output current	Io	80 mA
Maximum output power	Po	112 mW

Digital Memosens sensors other than CLS50D are connected via an inductive interface to the cables CYK10 and CYK20.

- The sensor simulator/Memocheck Sim test tool, type xYP03D-CC may be used with the following batteries: Duracell MN1500 or Energizer EN91
x ... C or O or OC



Certificate: 1718339
Project: 80123509

Master Contract: 205557
Date Issued: 2023-06-01

CLASS - C225804 - PROCESS CONTROL EQUIPMENT Intrinsically Safe, entity - For Hazardous Locations

Class I, Division 1, Groups A, B, C, D; Class II, Groups E, F, G, Class III; Type 4, IP66/67:

- Liquiline, type CM42-aSbdefgh two-wire transmitter for liquid analysis, rated 30 Vdc, 4-20mA; intrinsically safe with entity parameters (suffix c= 0 or 1) and FISCO (suffix c= 2, 3, 5 or 6) when installed per connection drawing 139711/ XA01687C; temperature code T4/T6, maximum ambient 55°C/50°C respectively.
- Liquiline, type CM42-aRbdefgh two-wire transmitter for liquid analysis, rated 30 Vdc, 4-20mA/HART output; intrinsically safe with entity parameters (suffix c= 0 or 1) and Profibus/Foundation Fieldbus output with FISCO Entity (suffix c= 2, 3, 5 or 6) when installed per connection drawing 139711/ XA01687C; temperature code T4/T6, maximum ambient 55°C/50°C respectively.

Suffixes in the type number can be the following:

- a = A, C, I, K, L, M, N, O, P or R (denotes sensor input);
- b = 1 letter code (denotes Certificate type);
- c = 0,1,2,3,5,6 (denotes output type);
- d = 0 (plastic housing) or 1 (stainless steel housing);
- e = 0, 1 or 2 (denotes cable entry type);
- f = 2 letter code (denotes software);
- g = 1 letter code (denotes device language);
- h = 1 letter code (denotes documentation).

Conditions of Acceptability:

The CM42 transmitter is suitable for connection with the following sensors:

- **Digital Sensors that match the electrical parameters of CM42 transmitter outputs with the following entity parameters:**

At Terminals: 187-188, 197-198

Maximum output voltage	Uo	5.04 V
Maximum output current	Io	80 mA
Maximum output power	Po	112 mW

Digital Memosens sensors other than CLS50D are connected via an inductive interface to the cables CYK10 and CYK20.

- The sensor simulator/Memocheck Sim test tool, type xYP03D-CC may be used with the following batteries: Duracell MN1500 or Energizer EN91
x ... C or O or OC



Certificate: 1718339

Project: 80123509

Master Contract: 205557

Date Issued: 2023-06-01

Class I, Division 1, Groups A, B, C, D
Ex ia IIC T3/T4/T6 Ga

•Analog Sensors

Inductive conductivity sensors xLS54-*****2***, intrinsically safe with entity parameters when installed per Control drawing 139711.

Conditions of Acceptability:

-Ambient temperature range of the connecting head of the sensor or the connecting cable: -20°C up to +60°C

-Process temperature range with regards to the temperature class(sensor part in contact with media:

Temperature class	T3	T4	T6
Process Temperature Range	$-10^{\circ}\text{C} \leq T_a \leq +125^{\circ}\text{C}$ 1)	$-10^{\circ}\text{C} \leq T_a \leq +105^{\circ}\text{C}$	$-10^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$

1) 150°C, max 60 minutes

Appropriate measures have to be taken in order to guarantee the decoupling of the connecting head of the sensor or the connecting lead from the process temperature

-This xLS54 sensor may only be used in liquid media with a conductivity of at least 10 nS/cm.

- Metallic process connection parts of the sensor xLS54 have to be mounted electrostatically conductive at the mounting location ($< 1 \text{ M}\Omega$).

-The manufacturer instruction regarding the permissible process conditions have to be adhered to.

Class I, Division 1, Groups A, B, C, D

•Analog Sensors

Inductive conductivity sensors: CLS50

Conducted conductivity sensors: CLS12, CLS13, CLS15, CLS16, CLS21

pH IsFET sensors: CPS441, CPS471, CPS491

pH Sensors: CPS11, CPS13, CPS41, CPS71, CPS91, CPF81

ORP sensors: CPS12, CPS42, CPS72, CPS92, CPF82

Temperature sensors: CTS1

Intrinsically safe with entity parameters when installed per Control drawing 139711.

APPLICABLE REQUIREMENTS

For the above listed transmitters(CM42) the following standard listings are applicable:

CSA C22.2 No. 25-1966	-	Enclosures for Use in Class II Groups E, F, and G Hazardous Locations
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Certificate: 1718339

Project: 80123509

Master Contract: 205557

Date Issued: 2023-06-01

CAN/CSA C22.2 No. 61010-1-12	-	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements
CSA C22.2 No. 157-92	-	Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations
CAN/CSA C22.2 No. 94-M91	-	Special Purpose Enclosures
CAN/CSA C22.2 No. 213-2016	-	Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous Locations

For the above listed analog sensors (except CLS54) the following standard listings are applicable:

CSAC22.2 No. 61010-1-12	-	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements
CSA C22.2 No. 157-92	-	Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations
CAN/CSA C22.2 No. 213-2016	-	Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous Locations

For the xLS54 sensor type only the following standard listings are applicable:

CSAC22.2 No. 61010-1-12, UPD1:2015, UPD2:2016, AMD1:2018	-	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements
CAN/CSA C22.2 No. 60079-0:19	-	Part 0 – Equipment – General Requirements
CAN/CSA C22.2 No. 60079-11:14	-	Part 11 – Equipment Protection by intrinsic safety “i”
CAN/CSA C22.2 No. 213-2016	-	Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous Locations

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.



Certificate: 1718339
Project: 80123509

Master Contract: 205557
Date Issued: 2023-06-01

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, without any adjacent indicators, indicating that products have been manufactured to the requirements of Canadian Standards.

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

Nameplate adhesive label material approval information:

Refer to Descriptive Documents Package for details. Markings are etched directly onto the housing. An internal adhesive nameplate is affixed to the display board cover plate and includes wiring information as well as the warnings re “Substitution of components ...” and “Do not Disconnect while circuits are live”.

Refer to drawing # 201615 for the transmitter name plate details.

The following details shall be provided by manufacturer on nameplate:

- Manufacturer’s name: "Endress+Hauser", or CSA Master Contract Number “205557”, adjacent to the CSA Mark in lieu of manufacturer’s name.
- 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 MMY format, or serial number, traceable to year and month of manufacture.
- Enclosure ratings: As specified in the PRODUCTS section, above.
- Hazardous Location designation: As specified in the PRODUCTS section, above. The word “Class” may be abbreviated “CL”, the word “Division” may be abbreviated “DIV”, and the word “Groups” may be abbreviated “GRP” or “GP”.
- Method of Protection markings for the CLS54 sensor (Ex -- markings): “Ex ia IIC T3/T4/T6 Ga”, where the marked temperature code is per PRODUCTS section, above.
- - The certificate number “CSA23CA80123509X” for the CLS54 sensor .
- Temperature code: As specified in the PRODUCTS section, above.
- Install per installation drawing as specified in the PRODUCTS section, above.
- 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:



Certificate: 1718339
Project: 80123509

Master Contract: 205557
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- “WARNING: For Div. 2 - Do not disconnect equipment unless power has been switched off or area is known to be non-hazardous”
 - “WARNING: Substitution of components may impair suitability for hazardous locations.”
 - AVERTISSEMENT: Pour Div. 2, débrancher l'appareil uniquement après avoir coupé l'alimentation électrique ou avoir vérifié qu'il ne soit pas installé en zone dangereuse.
 - AVERTISSEMENT: La substitution de composants peut compromettre l'adaptabilité aux emplacements dangereux.

Notes:

Products certified under Class C225803, C225804 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: 1718339

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
80123509	2023-06-01	Evaluation to update CSA-c report # 1718339 (last project 80050153) for addition of a new adaptor PCB layout for CLS54 sensor as outlined in the provided Technical Description document, new order code for CLS54 and updates to latest editions of applicable standards of CLS54 as agreed by the customer.
80050153	2020-09-01	Update to CSA report # 1718339 for intrinsically safe Liquiline transmitter for some small documentation updates (parts list and calculations) to the following modules: FBIH1, FBPA3, FSPH1, FSLI1, and FSLC1.
70220921	2020-03-26	Update CSA report 1718339 for the following modifications: <ul style="list-style-type: none">• Mechanical changes to the CM42 transmitter housing• Addition of alternate components for interface CPU module FC2W1• Remove all digital sensors from this report which shall be listed in a separate CSA report and Certificate (covered under CSA project 80021719)• Remove the US marking under respective classes and applicable standards for US
70175576	2018-04-12	Update CSA report 1718339 to add alternate electronics for sensor CPF8xD from KSG1 to KSG2. The KSG2 electronics is used in other certified sensors CPSx1D. In addition, some minor corrections to the product documentation.
70134358	2017-10-24	Update CSA report 1718339 to extend CSA certification to cCSAus based on the FM certificate for North America. Addition of new digital sensor COS81D and minor updates to the electronic circuit of CLS50D.
70091748	2016-12-22	Update to Report 1718339 to include revisions to the Memosens Cable CYK10/CYK20. Addition of new sensors CPS171D & CLS82D and to update the order codes.
70077955	2016-06-06	Update to include revisions to the FSDG1 and FBPA3 modules and to update the ordinary locations standard.



70045663	2015-11-27	Update to include minor changes to several modules and to include revised order codes.
70014303	2015-01-15	Update to add sensor module FBPA3 based on IECEx test data and to assess minor changes to the Hart and Display modules.
70006860	2014-09-30	Update to add the CLS50D sensor and to assess minor documentation changes.
2609594	2013-08-13	Addition of new sensors based on IECEx certification data.
2136733	2009-04-07	Update to include addition of new sensor types and alternative stainless steel enclosure.
1995720	2008-02-21	Update report to cover module revisions
1760473	2006-03-02	Add profibus Version
1718339	2005-11-11	Original Certification

Devices using 4-20mA / HART outputs

Transmitter Intrinsically Safe and Non-incendive Entity Parameters:

Terminals	V _{max}	I _{max}	C _i	L _i
133 and 134	30 V	100 mA	1.2 nF	29 µH
233 and 234	30 V	100 mA	0.2 nF	24 µH

Notes for CL. I, II and III Intrinsically Safe Installation:

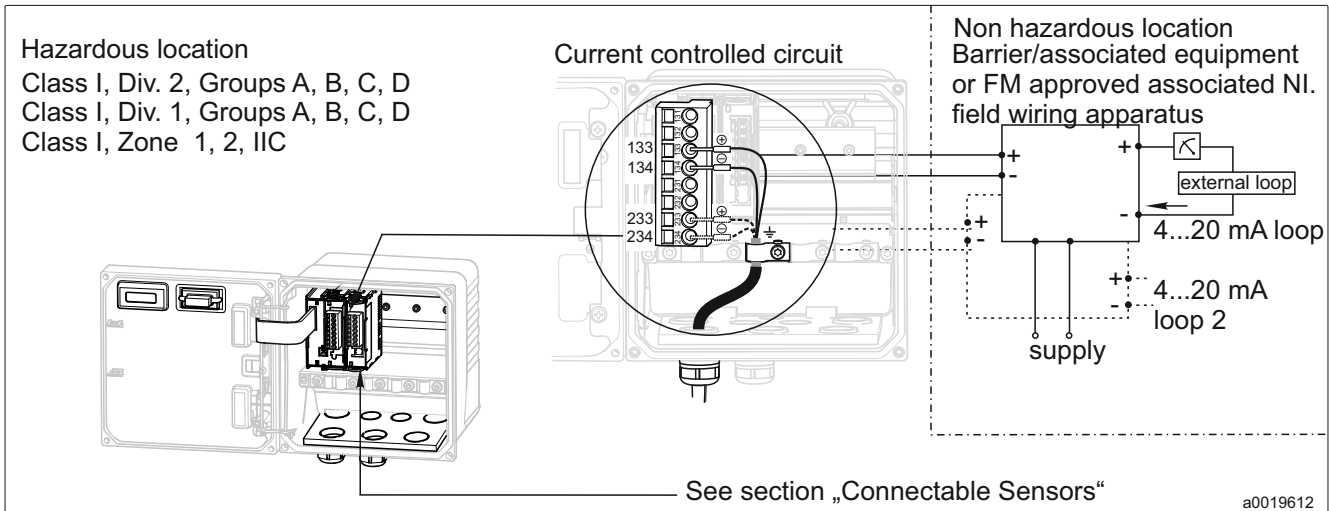
1. Install per the Canadian Electrical Code, Part I.
2. Control room equipment connected in the non-hazardous location must not use or generate voltages greater than 250 Vrms.
3. 4-20 mA circuit(s) must be connected to CSA Certified Associated Equipment where the following conditions are met for each loop: $V_{oc} \leq V_{max}$, $I_{sc} \leq I_{max}$, $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$.
4. Each 4-20mA circuit must use twisted, shielded pairs. Cable insulation and shielding must be maintained to within 10mm from terminal block connection.
5. Sensor wiring is intrinsically safe for connection to the specified sensors.

Notes for CL. I, Div.2 Non-incendive Field Wiring Installation:

1. Install per the Canadian Electrical Code, Part I.
2. Control room equipment connected in the non-hazardous location must not use or generate voltages greater than 250 Vrms.
3. 4-20mA circuit(s) must be connected to CSA Certified Associated Equipment (I.S. barriers) or CSA Certified equipment that provides non-incendive field wiring circuits where the following conditions are met for each loop: $V_{oc} \leq V_{max}$, $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$ (The 4-20 mA loops are current controlled circuits and therefore the Isc parameter and Imax parameter need not be aligned).
4. Each 4-20 mA circuit must use twisted, shielded pairs. Cable insulation and shielding must be maintained to within 10mm from terminal block connection.
5. Sensor wiring is non-incendive field wiring for connection to the specified sensors.

Notes for CL. I, Div. 2 Installation:

1. Install per the Canadian Electrical Code, Part I.
2. 4-20 mA circuits must be installed using CL. I, Div. 2 wiring methods.
3. Only cable entry thread NPT ½" is applicable.
4. Sensor wiring is non-incendive field wiring for connection to the specified sensors.



Devices using PROFIBUS and FOUNDATION FIELDBUS outputs

PROFIBUS PA and FOUNDATION FIELDBUS INSTALLATION IN CLASS I, DIV 1, GROUP A, B, C, D HAZARDOUS LOCATIONS

FISCO-Concept

The FISCO concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination.

The criteria for interconnection is that the voltage (U_i or V_{max}), the current (I_i or I_{max}) and the power (P_i or P_{max}) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (U_o or V_{oc}), the current (I_o or I_{sc}) and the power (P_o or P_{max}) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitances (C_i) and inductances (L_i) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 10 µH respectively.

In each segment, only one active device, normally the associated apparatus, is allowed to provide the necessary energy for the fieldbus system.

The voltage (U_o or V_{oc}) of the associated apparatus has to be limited to the range of 14 V to 24 V DC. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except to a leakage current of 50 µA for each connected device. Separately powered equipment needs a galvanic isolation to assure the intrinsically safe fieldbus circuit remains passive.

The cable used to interconnect the devices needs to have the parameters in the following range:

loop resistance R': 15 ... 150 Ω/km

inductance per unit length L': 0.4 ... 1 mH/km

capacitance per unit length C': 80 ... 200 nF/km

C' = C' line/line + 0.5C' line/screen, if both lines are floating or

C' = C' line/line + C' line/screen, if the screen is connected to one line length of spur cable: ≤30 m

length of trunk cable: ≤1 km length of splice: ≤1 m

At the end of the trunk cable an approved infallible line termination with the following parameters is suitable:

R = 90 ... 100 Ω

C = 0 ... 2.2 µF.

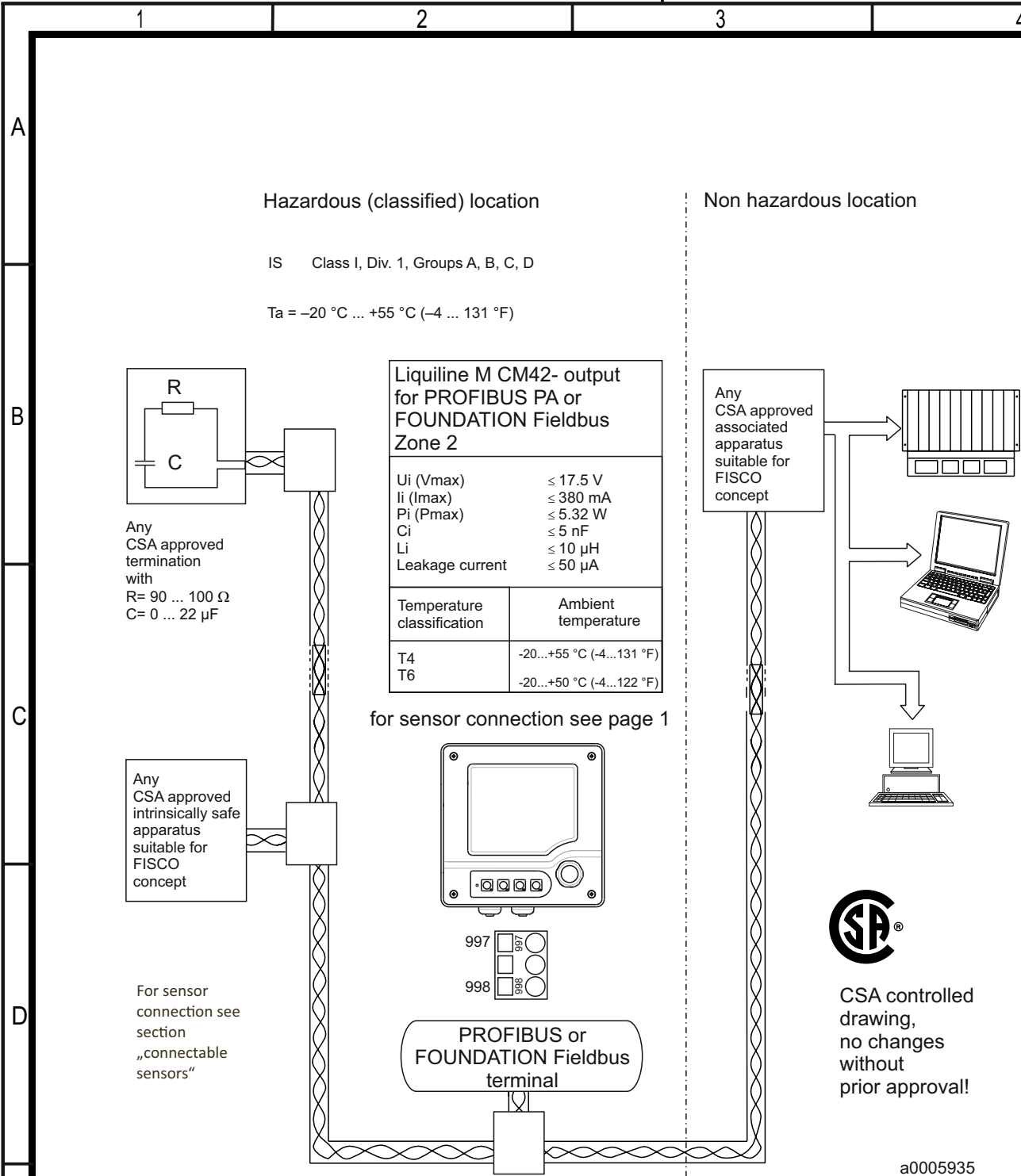
One of the allowed terminations might already be integrated in the associated apparatus.

The number of passive devices connected to the bus segment is not limited due to I.S. reasons. If the above rules are respected, up to a total length of 1000 m (sum of the length of trunk cable and all spur cables), the inductance capacitance of the cable will not impair the intrinsic safety of the installation.

Install per the Canadian Electrical Code, Part I for intrinsically safe field wiring.

<div>EH</div> <div>Endress+Hauser</div> <div>Endress+Hauser Conducta GmbH + Co. KG</div> <div>Gerlingen, Germany</div>	Refer to protection notice ISO 16016			Scale	Tolerance		
	Classification Confidential						
	Title Control Drawing CM42 (CSA) Zulassungszeichnung CM42 (CSA)			Notif. no. 118675	Designed	2016-10-24	MaentzH
				Number of changes 5	Drawing chng.	2023-03-07	AmroH
					Welding contr.		
				Status Released	Approval contr.	2023-03-07	BastA
					Pressure contr.		
				Released			2023-03-07
	No. of document 139711			Version L	Doc. part 000		
	Project CM42			Weight Volume			
Material			SAP material no.		Format A3	Page 1 of 4	

ISO 13715 GPS-FUNDAMENTALS
ISO 1101 GPS-DIMENSIONAL TOLERANCING
ISO 1302 GPS-DRAWING INDICATIONS
ISO 8015
ISO 14405
ISO 10135
EDGES OF UNDEFINED SHAPE
GPS-GEOMETRICAL TOLERANCING
GPS-INDICATION OF SURFACE TEXTURE



PROFIBUS PA and FOUNDATION FIELDBUS INSTALLATION IN CLASS I, DIV 2, GROUP A, B, C, D HAZARDOUS LOCATIONS

Installation Using Non-incendive Field Wiring - FNICO Concept (CM42-.S.2/3 and CM42-.S.5/6)

The FNICO concept allows interconnection of non-incendive apparatus to associated apparatus not specifically examined in such combination.

The criteria for interconnection is that the voltage (U_i or V_{max}), the current (I_i or I_{max}) and the power (P_i or P_{max}) which non-incendive apparatus can receive and remain non-incendive, considering faults, must be equal or greater than the voltage (U_o or V_{oc}), the current (I_o or I_{sc}) and the power (P_o or P_{max}) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitances (C_i) and inductances (L_i) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 20 µH respectively.

In each segment, only one active device, normally the associated apparatus, is allowed to provide the necessary energy for the fieldbus system.

The voltage (U_o or V_{oc}) of the associated apparatus has to be limited to the range of 14 V to 24 V DC. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except to a leakage current of 50 µA for each connected device. Separately powered equipment needs a galvanic isolation to assure the non-incendive fieldbus circuit remains passive.

The cable used to interconnect the devices needs to have the parameters in the following range: loop resistance

R: 15 ... 150 W/km

inductance per unit length L: 0.4 ... 1 mH/km capacitance per unit length

C: 80 ... 200 nF/km

C' = C' line/line + 0.5C' line/screen, if both lines are floating or

C' = C' line/line + C' line/screen, if the screen is connected to one line length of spur cable:

≤30 m

length of trunk cable: ≤1 km length of splice: ≤1 m

At the end of the trunk cable an approved infallible line termination with the following parameters is suitable:

R = 90 ... 100 W

C = 0 ... 2.2 µF.

One of the allowed terminations might already be integrated in the associated apparatus.

The number of passive devices connected to the bus segment is not limited due to N.I. reasons. If the above rules are respected, up to a total length of 1000 m (sum of the length of trunk cable and all spur cables), the inductance capacitance of the cable will not impair the non-incendive installation. Install per the Canadian Electrical Code, Part I

for non-incendive field wiring.

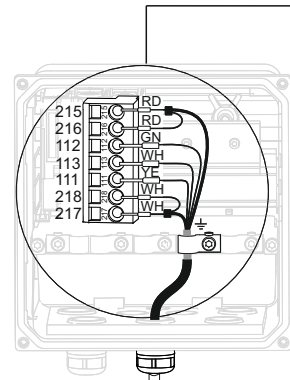
CLASS I, DIV 2, GROUP A, B, C, D HAZARDOUS LOCATION INSTALLATION.

- 1.Install per the Canadian Electrical Code, Part I.
- 2.Bus wiring must be installed using CLASS I, DIV 2 wiring methods.
- 3.Only cable entry thread NPT ½" is applicable.
- 4.Associated apparatus suitable for FNICO is not required. Max. supply voltage 32 V.
- 5.WARNING: Explosion Hazard - do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous. Substitution of components may impair suitability for CLASS I, DIV 2.
- 6.Sensor wiring is non-incendive field wiring for connection to specified sensors.

<div>Endress+Hauser</div> <div>Endress+Hauser Conducta GmbH + Co. KG</div> <div>Gerlingen, Germany</div>	Refer to protection notice ISO 16016				Scale	Tolerance		
	Classification		Confidential		Notif. no. 118675	Designed	2016-10-24	MaentzH
	Title Control Drawing CM42 (CSA) Zulassungszeichnung CM42 (CSA)			Drawing chng.		2023-03-07	AmroH	
				Welding contr.				
				Approval contr.		2023-03-07	BastA	
				Pressure contr.				
	Released		Released			2023-03-07	TameggerR	
			No. of document 139711		Version L	Doc. part 000		
	Project CM42		Weight		Volume			
	Material		SAP material no.			Format A3	Page 2 of 4	

Connectable Sensors

For devices using 4-20mA / HART, PROFIBUS and FOUNDATION FIELDBUS Outputs



max. cable length:
CLS50-S
180 ft (55 m)

CLS54-O
160 ft (50 m)



Inductive
conductivity sensor
CLS50-S
CLS54-O

CLS50 connection parameters:

Power Input $P_i \leq 350 \text{ mW}$
Voltage Input $U_i \leq 14 \text{ V}$
Current Input $I_i \leq 100 \text{ mA}$
 $C_i \leq 85 \text{ pF/m}$ – only cable
 $L_i \leq 0.25 \text{ }\mu\text{H/m}$ – only cable
CLS54 Connection parameters:
Power Input $P_i \leq 140 \text{ mW}$
Voltage Input $U_i \leq 14 \text{ V}$
Current Input $I_i \leq 100 \text{ mA}$
 $C_i \leq 85 \text{ pF/m}$ – only cable
 $L_i \leq 0.25 \text{ }\mu\text{H/m}$ – only cable

Digital sensor interface

Terminals: 187-188, 197-198

Maximum output voltage U_o 5.04 V

Maximum output current I_o 80 mA

Maximum output power P_o 112 mW

Effective internal capacitance C_i 12.4 μF (only internally, not effective)

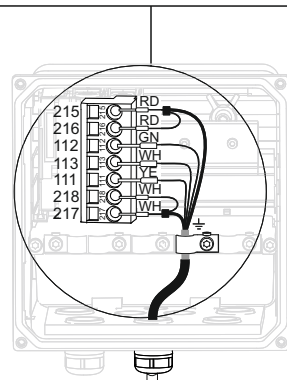
Effective internal inductance L_i 160.4 μH (only internally, not effective)

max. cable length CYK10, CYK20, CLS50D: 330 ft (100m)



Important installation hint:

Please note that the sensors shall not be operated in dust-ex-area. Only the transmitter can be used in dust-ex-area of Class II, groups E, F, G and Class III. Please install a separation wall between gas-ex and dust-ex area



max. cable
length:
165 ft (50 m)



Conductive
conductivity sensors
CLS12/13
CLS15/16
CLS21

CLS21

Connection parameters

CLS12, CLS13, CLS15, CLS16, CLS21:

Power Input $P_i \leq 130 \text{ mW}$

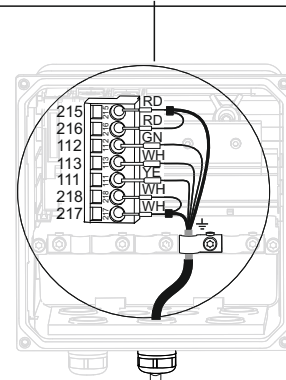
Voltage Input $U_i \leq 15 \text{ V}$

Current Input $I_i \leq 30 \text{ mA}$

$C_i \leq 1 \text{ nF/m}$ – only cable

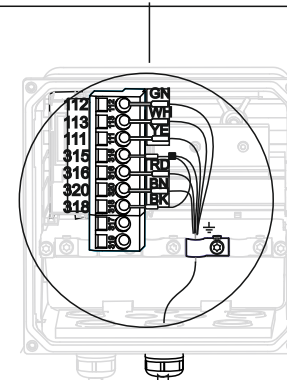
$L_i \leq 6 \text{ }\mu\text{H/m}$ – only cable

or other simple apparatus

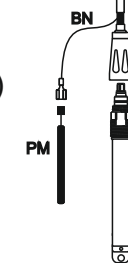


Digital interface
FSDG1 for
Memosens
devices

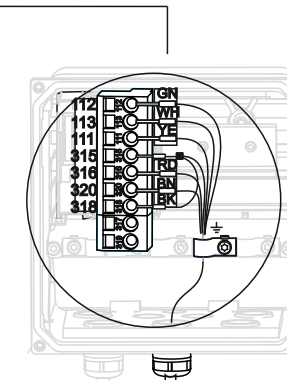
For details see
"Digital sensor
interface"



max. cable
length:
330 ft
(100 m)



pH ISFET sensors
CPS441/471/491



max. cable
length:
165 ft (50 m)



pH electrodes
CPS11/13/41/64/71/91, CPF81-...1A/1C

ORP electrodes

CPS12/42/72/92, CPF82-...A

Temperature

CTS1-A2GSA/A2ZSA, CTS1-D2GFB

pH Connection parameters:

Power Input $P_i \leq 200 \text{ mW}$

Voltage Input $U_i \leq 17 \text{ V}$

Current Input $I_i \leq 130 \text{ mA}$

$C_i \leq 1 \text{ nF/m}$ – only cable

$L_i \leq 6 \text{ }\mu\text{H/m}$ – only cable

or other simple apparatus



Hazardous location

Class I, Division 1,
Groups A, B, C, D

Class II, Groups E, F, G,

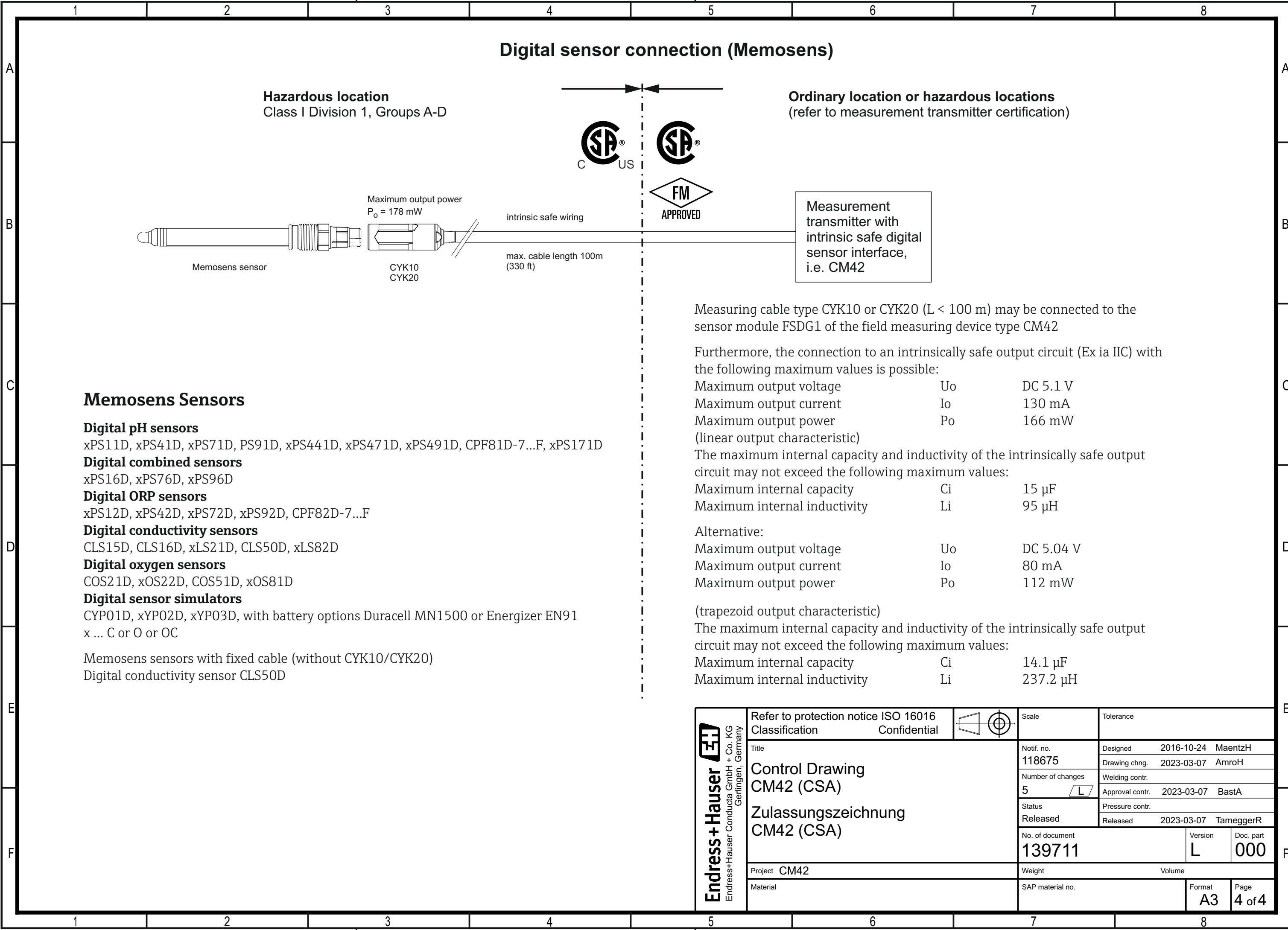
Class III

Hazardous location

Class I, Division 1,
Groups A, B, C, D

Endress+Hauser Endress+Hauser Conducta GmbH + Co. KG Gerlingen, Germany	Refer to protection notice ISO 16016		Scale	Tolerance	
	Classification Confidential				
	Title		Notif. no.	Designed	2016-10-24 MaentzH
	Control Drawing		118675	Drawing chng.	2023-03-07 AmroH
	CM42 (CSA)		Number of changes	Welding contr.	
			5	Approval contr.	2023-03-07 BastA
			Status	Pressure contr.	
			Released	Released	2023-03-07 TameggerR
			No. of document	Version	Doc. part
			139711	L	000
	Project CM42		Weight	Volume	
	Material		SAP material no.	Format	Page
				A3	3 of 4

ISO 13715 GPS-FUNDAMENTALS
ISO 1101 GPS-DIMENSIONAL TOLERANCING
ISO 1302 GPS-DRAWING INDICATIONS
EDGES OF UNDEFINED SHAPE
GPS-GEOMETRICAL TOLERANCING
GPS-INDICATION OF SURFACE TEXTURE



Memosens Sensors

Digital pH sensors

xPS11D, xPS41D, xPS71D, PS91D, xPS441D, xPS471D, xPS491D, CPF81D-7...F, xPS171D

Digital combined sensors

xPS16D, xPS76D, xPS96D

Digital ORP sensors

xPS12D, xPS42D, xPS72D, xPS92D, CPF82D-7...F

Digital conductivity sensors

CLS15D, CLS16D, xLS21D, CLS50D, xLS82D

Digital oxygen sensors

COS21D, xOS22D, COS51D, xOS81D

Digital sensor simulators

CYP01D, xYP02D, xYP03D, with battery options Duracell MN1500 or Energizer EN91
x ... C or O or OC

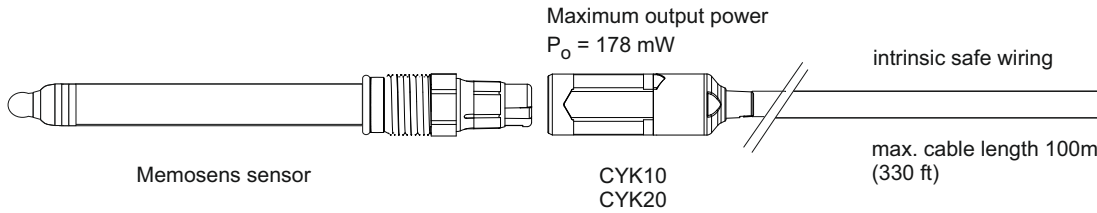
Memosens sensors with fixed cable (without CYK10/CYK20)

Digital conductivity sensor CLS50D

Digital sensor connection (Memosens)

Hazardous location
Class I Division 1, Groups A-D

Ordinary location or hazardous locations
(refer to measurement transmitter certification)



Measuring cable type CYK10 or CYK20 (L < 100 m) may be connected to the sensor module FSDG1 of the field measuring device type CM42

Furthermore, the connection to an intrinsically safe output circuit (Ex ia IIC) with the following maximum values is possible:

Maximum output voltage	U _o	DC 5.1 V
Maximum output current	I _o	130 mA
Maximum output power	P _o	166 mW

(linear output characteristic)

The maximum internal capacity and inductivity of the intrinsically safe output circuit may not exceed the following maximum values:

Maximum internal capacity	C _i	15 µF
Maximum internal inductivity	L _i	95 µH

Alternative:

Maximum output voltage	U _o	DC 5.04 V
Maximum output current	I _o	80 mA
Maximum output power	P _o	112 mW

(trapezoid output characteristic)

The maximum internal capacity and inductivity of the intrinsically safe output circuit may not exceed the following maximum values:

Maximum internal capacity	C _i	14.1 µF
Maximum internal inductivity	L _i	237.2 µH

Endress+Hauser Endress+Hauser Conducta GmbH + Co. KG Gerlingen, Germany	Refer to protection notice ISO 16016 Classification	Confidential	Scale		Tolerance	
	Title Control Drawing CM42 (CSA) Zulassungszeichnung CM42 (CSA)		Notif. no. 118675		Designed 2016-10-24 MaentzH	
			Drawing chng.		2023-03-07 AmroH	
			Number of changes 5		Welding contr.	
			Status Released		Approval contr. 2023-03-07 BastA	
			Released		Pressure contr.	
			Released		Released 2023-03-07 TameggerR	
	Project CM42		No. of document 139711		Version L	Doc. part 000
	Material		SAP material no.		Format A3	Page 4 of 4
			Weight		Volume	