



Certificate of Compliance

Certificate: 70184381

Master Contract: 272694

Project: 80106373

Date Issued: 2021-01-18

Issued To: Core Sensors LLC
628 Route 10 Unit 8
Whippany, New Jersey, 07981
United States

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: Ronald (Ron) Bell
Ronald (Ron) Bell

PRODUCTS

CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations

CLASS 2258 82 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations – Certified to U.S. Standards

Class I, Division 2, Groups A, B, C, D, T4

The **CS5x** series models: **CS5c-d-e-xxxxx-x-x-a-b-xxx-xx**;, pressure sensor for fluid pressure measurement; where code 'a' is the electrical output, code 'b' is the permitted electrical connection, code 'c' is the sensor element type, code 'd' is the process connection type, code 'e' is the wetted material type and "x" is any alphanumeric digit. The available electrical output is either a 2-wire current loop, 3-wire voltage signal, or 4-wire millivolt signal. The maximum working pressure is 207 MPa (30,000 PSI), Single Seal (CS50 model only). Refer to drawing 00553 for applicable pressure range. Install the sensor as per drawing # 00551.

The electrical and temperature ratings for model; **CS5c-d-e-xxxxx-x-x-a-b-xxx-xx**:

Order code 'a'	Electrical Output Type	Ratings	Temperature
1	1-5 VDC		Ambient: -40°C to 80°C



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3	1-6 VDC	28VDC, 800mW max.	Process: -40°C to 125°C For electrical connection option 'F' only: Ambient: -20°C to 80°C Process: -40°C to 105°C
4	4-20 mA		
5	0-5 VDC		
7	0-10 VDC		
F	1-10 VDC		
K	Regulated Millivolt		
2	0.5-4.5 VDC RATIOMETRIC	7VDC, 275mW max.	
8	0.5-2.5 VDC NON-RATIOMETRIC		
9	10mV/V		
B	20mV/V		

Where code "b" = F, H, P, Y, Z
 'F' (DIN 43650A),
 'H' (Turck® Mini-Fast®),
 'P' (Conduit with cable),
 'Y' (Turck® Lokfast® M12),
 'Z' (Conduit with cable gland).

Where code "c" = 0, 1, 4
 "0" (One Piece Structure)
 "1" (Two Piece Structure)
 "4" (Two Piece Differential Structure)

Where code "d" = 1, 2, 3, 4, 8, A, B, C, D, E, G, H
 "1" (1/2" MNPT)
 "2" (1/4" MNPT)
 "3" (1/8" MNPT)
 "4" (7/16-20 UNF male)
 "8" (F250C Female Autoclave (≥ 10,000 PSI))
 "A" (1/4" FNPT)
 "B" (7/16-20 UNF Female w/ depressor pin)
 "C" (G1/4 male)
 "D" (1/4" BSPP male)
 "E" (G1/2 male)
 "G" (3/8-24 UNF male)
 "H" (9/16-18 UNF male)

Where code "e" = A, B, C, D
 "A" = 316L SS
 "B" = 17-4PH SS
 "C" = HASTELLOY C276
 "D" = INCONEL 718

Conditions of Acceptability:



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1. Under certain extreme circumstances, exposed plastic and unearthed metal parts of the enclosure may store an ignition capable of an electrostatic charge. Therefore, the user/installer shall implement provisions to prevent the buildup of electrostatic charge, i.e. locate the equipment where a charge-generating mechanism is unlikely to be present, and clean with a damp cloth.
2. Because the enclosure is made from light metal, in rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation and operation. Use care not to cause impacts or scrapes with other metal objects during installation.
3. The end user shall ensure appropriate earthing of the metallic accessories upon installation.
4. The final installation of the device in Hazardous area shall meet the requirements of CEC (for Canada) and NEC (for USA) for wiring method that is subject to acceptance of local authority having jurisdiction.
5. Do not connect or disconnect the equipment when energized in an explosive atmosphere.
6. The CS5x series sensors shall be supplied by Class 2 or limited energy source only in accordance with CSA 61010-1-12.
7. The equipment is for use under atmospheric conditions only, the permissible pressure range is 0.8 to 1.1 bar (80 to 110 kPa) and the permissible normal oxygen content is typically 21 % v/v.

CLASS 2258 04 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations
CLASS 2258 84 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations –
 CERTIFIED TO U.S. STANDARDS

Ex ia IIB T4 Ga
Class I, Zone 0, AEx ia IIB T4 Ga
Class I, Division 1, Groups C, D, T4; Ex ia

The **CS8x** series models: CS8c-d-e-xxxxx-x-x-a-x-xxx-xx: pressure sensor for fluid pressure measurement; where code “a” is the electrical output, code ‘c’ is the sensor element type, code ‘d’ is the process connection type, code ‘e’ is the wetted material type and “x” is any alphanumeric digit. The permitted electrical output is either 2-wire current loop, 3-wire voltage signal or 4-wire millivolt signal. The maximum working pressure is 207 MPa (30,000 PSI), Single Seal (CS80 model only). Refer to drawing 00553 for applicable pressure range. Install the sensor as per drawing # 00091.

IS Entity parameters defined in control drawing # 00091 are as below:

CS8x output type	Electrical Output Code “a”	IS Entity Parameters with integral connector	IS Entity Parameters with cable	Temperatures
4-20mA	4	Ui = 28V, Ii = 93mA, Pi = 650mW, Ci = 0.25uF, Li = 0uH	Ui = 28V, Ii = 93mA, Pi = 650mW, Ci = 0.292uF, Li = 155uH (max. cable length 1000 ft.)	Ambient temperature: -40°C...+80°C Ambient temperature: -20°C...+80°C (sensor



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1-5V, 1-6V, 1-10V voltage	1, 3, F	U _i = 28V, I _i = 93mA, P _i = 650mW, C _i = 0.591uF, L _i = 0uH	U _i = 28V, I _i = 93mA, P _i = 650mW, C _i = 0.598uF, L _i = 23.25uH (max. cable length 150 ft.)	with DIN 43650A connector) Process Temperature: - 40°C...+125°C Process Temperature: - 40°C...+105°C (sensor with DIN 43650A connector)
0-5V, 0-10V voltage	5, 7	U _i = 22V, I _i = 73mA, P _i = 400mW, C _i = 0.811uF, L _i = 0uH	U _i = 22V, I _i = 73mA, P _i = 400mW, C _i = 0.818uF, L _i = 23.25uH (max. cable length 150 ft.)	
0.5-4.5V ratiometric, 0.5-2.5V non- ratiometric	2, 8	U _i = 28V, I _i = 93mA, P _i = 650mW, C _i = 0.239uF, L _i = 0uH	U _i = 28V, I _i = 93mA, P _i = 650mW, C _i = 0.245uF, L _i = 23.25uH (max. cable length 150 ft.)	
Millivolt (Regulated)	K	U _i = 28V, I _i = 93mA, P _i = 650mW, C _i = 0.357uF, L _i = 0uH	U _i = 28V, I _i = 93mA, P _i = 650mW, C _i = 0.364uF, L _i = 23.25uH (max. cable length 150 ft.)	

Ex ia IIC T4 Ga
Class I, Zone 0, AEx ia IIC T4 Ga
Class I, Division 1, Groups A, B, C, D, T4; Ex ia

The **CS8x** series model: CS8c-**d-e**-xxxxx-x-x-a-x-xxx-xx: pressure sensor for fluid pressure measurement; where code “a” is the electrical output, code ‘c’ is the sensor element type, code ‘d’ is the process connection type, code ‘e’ is the wetted material type and “x” is any alphanumeric digit. The permitted electrical output is 4-wire millivolt signal. The maximum working pressure is 207 MPa (30,000 PSI), Single Seal (CS80 model only). Refer to drawing 00553 for applicable pressure range. Install the sensor as per drawing # 00091.

IS Entity parameters defined in control drawing # 00091 are as below:

CS8x output type	Electrical Output Code “a”	IS Entity Parameters with integral connector	IS Entity Parameters with cable	Temperatures



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10mV/V, 20mV/V	9, B	U _i = 28V, I _i = 93mA, P _i = 650mW, C _i = 48pF, L _i = 0uH	U _i = 28V, I _i = 93mA, P _i = 650mW, C _i = 0.007uF, L _i = 23.25uH (max. cable length 150 ft.)	Ambient temperature: -40°C...+80°C Ambient temperature: -20°C...+80°C (sensor with DIN 43650A connector) Process Temperature: -40°C...+125°C Process Temperature: -40°C...+105°C
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CS8c-d-e-xxxxx-x-x-a-x-xxx-xx

Where code "c" = 0, 1, 2, 4

- "0" (One Piece Structure)
- "1" (Two Piece Structure)
- "2" (Two Piece Structure Submersible)
- "4" (Two Piece Differential Structure)

Where code "d" = 1, 2, 3, 4, 6, 8, A, B, C, D, E, G, H

- "1" (1/2" MNPT)
- "2" (1/4" MNPT)
- "3" (1/8" MNPT)
- "4" (7/16-20 UNF male)
- "6" (Nosecone / Nosecap)
- "8" (F250C Female Autoclave (≥ 10,000 PSI))
- "A" (1/4" FNPT)
- "B" (7/16-20 UNF Female w/ depressor pin)
- "C" (G1/4 male)
- "D" (1/4" BSPP male)
- "E" (G1/2 male)
- "G" (3/8-24 UNF male)
- "H" (9/16-18 UNF male)

Where code "e" = A, B, C, D

- "A" = 316L SS
- "B" = 17-4PH SS
- "C" = HASTELLOY C276
- "D" = INCONEL 718

Conditions of Acceptability:

1. Under certain extreme circumstances, exposed plastic and unearthed metal parts of the enclosure may store an ignition capable of an electrostatic charge. Therefore, the user/installer shall implement provisions to



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prevent the buildup of electrostatic charge, i.e. locate the equipment where a charge-generating mechanism is unlikely to be present, and clean with a damp cloth.

2. Because the enclosure is made from light metal, in rare cases, ignition sources due to impact and friction sparks could occur. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation and operation. Use care not to cause impacts or scrapes with other metal objects during installation.
3. The end user shall ensure appropriate earthing of the metallic accessories upon installation.
4. The final installation of the device in Hazardous area shall meet the requirements of CEC (for Canada) and NEC (for USA) for wiring method that is subject to acceptance of local authority having jurisdiction.
5. The equipment is for use under atmospheric conditions only, the permissible pressure range is 0.8 to 1.1 bar (80 to 110 kPa) and the permissible normal oxygen content is typically 21 % v/v.

- CLASS 2252 06** - PROCESS CONTROL EQUIPMENT
CLASS 2252 86 - PROCESS CONTROL EQUIPMENT (Certified to U.S. Standards)

The **CS1x** series model code: CS10/CS11/CS12/CS14-x-x-xxxxx-x-x-**a**-**b**-xxx-xx, pressure sensor for fluid pressure measurement; where code ‘a’ is the electrical output, code ‘b’ is the permitted electrical connection, and ‘x’ is any alphanumeric digit. The available electrical output is either a 2-wire current loop, 3-wire voltage signal, or 4-wire millivolt signal. The maximum working pressure is 207 MPa (30,000 PSI),

Order code ‘a’	Electrical Output Type	Ratings	Temperature
1	1-5 VDC	8V-28VDC, 800mW max.	Ambient: -40°C to 80°C Process: -40°C to 125°C For electrical connection option ‘F’ only: Ambient: -20°C to 80°C Process: -40°C to 105°C
3	1-6 VDC		
4	4-20 mA		
5	0-5 VDC		
7	0-10 VDC		
F	1-10 VDC		
K	Regulated Millivolt (up to max. 200mV)	7VDC, 275mW max.	
2	0.5-4.5 VDC RATIOMETRIC		
8	0.5-2.5 VDC NON-RATIOMETRIC		
9	10mV/V unregulated		
B	20mV/V unregulated		
A	Millivolt uncompensated (up to max. 100mV/V)		
L	Millivolt unregulated (up to max. 20mV/V)		

Order code “b” for various type of electrical connections, is defined in the product nomenclature. Refer to drawing 00374.

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1. The CS1x series sensors shall be supplied by Class 2 or limited energy source only in accordance with CSA 61010-1-12.
2. CS11 sensor shall be installed within an external enclosure. The suitability of the enclosure is subject to investigation by the local Authority Having Jurisdiction at the time of installation.
3. Working pressure range of the sensor element is specified in document 00553.

APPLICABLE REQUIREMENTS

CAN/CSA C22.2 No. 61010-1-12	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements - Third Edition
CSA Std. C22.2 No. 213-2017	Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
CAN/CSA-C22.2 No. 60079-0: 2015	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/ISA-61010-1 3 rd Edition	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements - Third Edition
ANSI/UL-121201, 9 th Edition	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
ANSI/UL 60079-0:2013 6 th Edition	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements
ANSI/UL 60079-11:2013 6 th Edition	Electrical apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety "i"
ANSI/UL 122701-2017	Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids

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.



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The following shall be provided on an adhesive nameplate located on the sensor body:

- CSA Monogram with, or without the “C” and “US” indicators
- The year and certificate number “CSA 19CA70184381” (Not required for CS1x models)
- Submitter Identification “Core Sensors”, or CSA master contract number “272694”, adjacent to the CSA Mark in lieu of manufacturer’s name
- Model code designation; As specified in the PRODUCTS section, above
- Serial Number, Date Code or Month and Year of Manufacture
- Electrical Ratings, as specified in the PRODUCTS section, above
- Ambient temperature rating, as specified in the PRODUCTS section, above
- Process temperature rating, as specified in the PRODUCTS section, above
- The operating pressure range, as specified in the PRODUCTS section, above
- Process Seal type “Single Seal” for one piece sensor only, when specified in the PRODUCTS section, above
- Hazardous Location Designation, as specified in the PRODUCTS section, above: “Class I, Division 2, Groups A, B, C, D T4”, or “Class I, Division 1, Groups A, B, C, D, T4 Ex ia” (Not required for CS1x models)
- Method of Protection markings; as specified for the intrinsically safe models in the PRODUCTS section, above: “Ex ia IIB T4 Ga” or “Ex ia IIC T4 Ga” for Canada, and “Class I, Zone 0 AEx ia IIB T4 Ga” or “Class I, Zone 0 AEx ia IIC T4 Ga” for USA (Not required for CS1x models)
- Installation as per control drawing # 00091, for Zone 0/Div.1 models (Not required for CS1x models)
- Installation as per drawing # 00551, for Division 2 models (Not required for CS1x models)
- Warning as below both in English and French (Not required for CS1x models):
 - WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS
 - AVERTISSEMENT: RISQUE POTENTIEL DE DECHARGES ELECTROSTATIQUES – VOIR CONSIGNES
 - WARNING – EXPLOSION HAZARD. DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED
 - AVERTISSEMENT – RISQUE D’EXPLOSION. NE PAS BRANCHER NI DÉBRANCHER SOUS TENSION
 - ISO 3864 Symbol B.3.1  or ISO 7000 symbol 0434  (triangle with exclamation point)

Notes:

Products certified under Class C225206, C225286, C225802, C225804, C225882, 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

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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
80106373	2022-01-18	Update to report 70184381 to correct the revision of drawing 00129 to C in descriptive document list, and correct clerical errors in products section.
80060757	2021-04-20	Update to report 70184381 to reflect updated entity parameters for drawings 00090 and 00091 and correct typographical errors.
70215007	2019-06-12	Update to CSA report 70184381 to include process seal "Single Seal" marking and addition of Ordinary location model CS1x series.
70184381	2019-05-01	Original cCSAus Certification of the pressure transducer model CS5x and CS8x series with the following markings: Ex ia IIB/IIC T4 Ga ; Class I, Zone 0, AEx ia IIB/IIC T4 Ga; Class I, Div. 1, Groups A, B, C, D, T4; Class I, Div. 2, Groups A, B, C, D, T4; $-40^{\circ}\text{C} \leq \text{Ta} \leq +80^{\circ}\text{C}$ Process temperature: -40°C to $+125^{\circ}\text{C}$. Measuring working pressure is 207MPa.