



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEX CSA 19.0002X	Page 1 of 4	<u>Certificate history:</u>
Status:	Current	Issue No: 3	Issue 2 (2023-01-31)
Date of Issue:	2023-06-13		Issue 1 (2020-09-10)
			Issue 0 (2019-08-19)
Applicant:	Conax Technologies LLC 2300 Walden Ave. Buffalo, New York 14225 United States of America		
Equipment:	Thermocouple Assemblies		
Optional accessory:			
Type of Protection:	Ex ec		
Marking:	Ex ec IIC Gc T6 to T2		
	IP66 [P/N; 10-3379-001 and 10-3380-001 w/Terminal Head] -20°C ≤ Ta ≤ + 260°C		
	IP54 [P/N; 10-3371-001/-002/-003 and 10-3381-001/-002/-003 w/Harting Connectors] -20°C ≤ Ta ≤ + 200°C		
	IP66 [P/N; 10-3719-022/-023/-024, 10-3720-022/-023/-024, and 10-3995-022/023/024 w/Terminal Head]; -20°C ≤ Ta ≤ +260°C		
	IP54 [P/N; 10-3631-011 and 10-3633-031 w/Harting connectors]; -20°C ≤ Ta ≤ +200°C		
	IP54 [P/N; 10-3637-011/051/061 and 10-3639-031 w/Harting connectors]; -20°C ≤ Ta ≤ +200°C		
	IP54 [P/N; 10-3653-011 and 10-3655-031 w/Harting connectors]; -20°C ≤ Ta ≤ +200°C		
	IP66 [P/N; 10-4066-001 thru 006, 10-4069-001, and 10-4070-001 w/Terminal Head]; -20°C ≤ Ta ≤ +260°C		
	IP54 [P/N; 10-4071-001, 10-4072-001, and 10-4073-001 W/Harting connectors]; -20°C ≤ Ta ≤ +200°C		

Approved for issue on behalf of the IECEx
Certification Body:

Dave Magee

Position:

Senior Director of Operations, Toronto

Signature:
(for printed version)

Date:
(for printed version)

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Canada





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Manufacturer: **Conax Technologies LLC**
2300 Walden Ave.
Buffalo, New York 14225
United States of America

Manufacturing locations: **Conax Technologies LLC**
2300 Walden Ave.
Buffalo, New York 14225
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-7:2017 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

CA/CSA/ExTR19.0002/00
CA/CSA/ExTR19.0002/03

CA/CSA/ExTR19.0002/01

CA/CSA/ExTR19.0002/02

Quality Assessment Report:

CA/CSA/QAR16.0005/07



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

Equipment are Conax thermocouple assemblies for Siemens 8000, 9000, and 5000F (6.X) series turbines. See Annex I, II and III respectively for details.

SPECIFIC CONDITIONS OF USE: YES as shown below:

The equipment shall be protected from risk of mechanical impact either by installation or other suitable means such as enclosures, or mechanical guards.

"WARNING: SEPARATE ONLY IN A NON-HAZARDOUS AREA"

"WARNING: DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED"



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Issue 1 – this Issue introduced the following changes:

- i. Add the following Thermocouple assembly model numbers:
 - 10-3719-022/-023/-024 and 10-3720-022/-023/-024 (w/Terminal Head)
 - 10-3631-011 and 10-3633-031 (w/Harting Connectors)
 - 10-3637-011 and 10-3639-031 (w/Harting connectors)
 - 10-3653-011 and 10-3655-031 (w/Harting connectors)
- ii. Update 60079-7 edition from 5.0 to 5.1.
- iii. Re name Annex document to Annex I.
- iv. Add Annex II.
- v. Clerical correction of drawing revision levels to reflect revision level on existing documents.
- vi. Add documents that support assembly models per 1.1 i.

Issue 2 – this Issue introduced the following changes:

- i. Addition of new thermocouple part numbers 10-4066, 10-4069, 10-4070, 10-4071, 10-4072, 10-4073 and 10-3995-XXX.

Issue 3 – this Issue introduced the following changes:

- i. Change PJ connectors containing part numbers, 10-4071-001, 10-4072-001 and 10-4073-001 to Harting connectors; and add new model of 10-3637-051 and 10-3637-061 to 10-3637 series assemblies.

Annexes:

[Annex III_IECEX_CSA_19.0002X issue 3.pdf](#)

[Annex II_IECEX_CSA_19.0002X issue 3.pdf](#)

[Annex I_IECEX_CSA_19.0002X issue 3.pdf](#)



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Annex III

Thermocouple Assemblies For Siemens 5000F (6.X) Series Turbine

1. Conax P/N 10-4066-001 thru 006 - w/ Terminal Head; "Disc Cavity 2/3/4 Thermocouple" Used on Siemens 5000F (6.X) Series Turbine

- 1.1. Consists of two thermocouples in a long slender SST tube. A wiring compartment enclosure, with high temperature terminal block is attached at one end, the thermocouple junctions sealed within the tube are attached at the other end.

The thermocouples are Type "K" with dual hot junctions. The sheath is of 304 SST with an outer tip diameter of 0.125" (3.2 mm) and an outer protection tube diameter of 0.250" (6.3 mm) and a raised face mounting flange.

- 1.2. Thermocouple Assembly described in Para. 1.1 is IECEx certified to:

- Ex ec II C Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq T_a \leq +260^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+427^{\circ}\text{C}$
- Pressure Ratings: 1.03 bar max
- IP rating: 66
- Ratings O/P: 0 to 50 mV max

2. Conax P/N 10-4069-001 - w/ Terminal Head; "Turbine Casing Thermocouple" Used on Siemens 5000F (6.X) Series Turbine

- 2.1. Consists of two thermocouples in a long slender SST tube. A wiring compartment enclosure, with high temperature terminal block is attached at one end, the thermocouple junctions sealed within the tube are attached at the other end.

The thermocouples are Type "K" with dual hot junctions. The sheath is of 304 SST with an outer tip diameter of 0.250" (6.3 mm) with .50-14 NPT mounting thread, terminating to SST terminal head.

- 2.2. Thermocouple Assembly described in Para. 2.1 is IECEx certified to:

- Ex ec II C Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq T_a \leq +260^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+427^{\circ}\text{C}$
- Pressure Ratings: 1.03 bar max
- IP rating: 66



- Ratings O/P: 0 to 50 mV max

3. Conax P/N 10-4070-001 - w/ Terminal Head; "Bladepath Dual Thermocouple" Used on Siemens 5000F (6.X) Series Turbine

- 3.1. Consists of two thermocouples in a long slender SST tube. A wiring compartment enclosure, with high temperature terminal block is attached at one end, the thermocouple junctions sealed within the tube are attached at the other end.

The thermocouples are Type "KK" with dual hot junctions. The sheath is of 321 SST with an outer tip diameter of 0.187" (4.8 mm) with .75-14 NPT mounting thread, terminating to a SST terminal head.

- 3.2. Thermocouple Assembly described in Para. 3.1 is IECEX certified to:

- Ex ec IIC Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq T_a \leq +260^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+670^{\circ}\text{C}$
- Pressure Ratings: 1.2 bar max
- IP rating: 66
- Ratings O/P: 0 to 50 mV max

4. Conax P/N 10-4071-001 with Harting Connectors; "Flashback Thermocouple" Used on Siemens 5000F (6.X) Series Turbine

- 4.1. Consists of one thermocouple in a long slender Inconel tube. A wiring compartment enclosure, with multi-pin connector is attached at one end, the thermocouple junctions sealed within the tube are attached at the other end.

The thermocouples are Type "KK" with single hot junctions. The sheath is of Inconel 600 with an outer sheath diameter of 0.125" (3.2 mm) with a reduced diameter tip to 0.062" (1.6mm) with mounting Swagelok fitting, terminating to a multi-pin connector.

- 4.2. Thermocouple Assembly described in Para. 4.1 is IECEX certified to:

- Ex ec IIC Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq T_a \leq +200^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+440^{\circ}\text{C}$
- Pressure Ratings: @ 25 bar max
- IP ratings: 54
- Ratings O/P: 0 to 50 mV max



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5. Conax P/N 10-4072-001 and 10-4073-001 with Harting Connectors; "Compressor Outlet Thermocouple" Used on Siemens 5000F (6.X) Series Turbine

5.1. Consists of two thermocouples in a long slender Inconel tube. A wiring compartment enclosure, with multi-pin connector is attached at one end, the thermocouple junctions sealed within the tube are attached at the other end.

The thermocouples are Type "KK" with dual hot junctions. The sheath is of Inconel 600 with an outer sheath diameter of 0.187" (4.8 mm) with a 321 SST tube well with an M36 mounting thread terminating to multi-pin connector.

5.2. Thermocouple Assembly described in Para. 4.1 is IECEx certified to:

- Ex ec II C Gc T6 to T2 with:
- Ambient Temperature: $-20^{\circ}\text{C} \leq T_a \leq +200^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+450^{\circ}\text{C}$
- Pressure Ratings: 24 bar max
- IP ratings: 54
- Ratings O/P: 0 to 50 mV max



Annex II

Thermocouple Assemblies For Siemens 9000 Series Turbine

1. **Conax P/N 10-3719-022/023/024 (60 HZ Turbine), P/N 10-3720-022/023/024 (50 HZ Turbine) and P/N 10-3995-022/023/024 (60 HZ Turbine) - w/ Terminal Head; "HMS2 Disc Cavity Thermocouple" Used on Siemens 9000 Series Turbine**

- 1.1. Consists of two thermocouples in a long slender Inconel tube. A wiring compartment enclosure, with high temperature terminal block is attached at one end, the thermocouple junctions sealed within the tube are at the other end.

Each of the two (2) thermocouples are a Type "N" with ungrounded hot junctions. The sheath is of Inconel 600 with an outer diameter of 0.125" (3.2 mm). This assembly is fitted within a 0.236" (6.00 mm) SST overtube with a raised face mounting flange and terminating to a SST terminal head enclosure.

- 1.2. Thermocouple Assembly described in Para. 1.1 is IECEX certified to:

- Ex ec IIC Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq T_a \leq +260^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+500^{\circ}\text{C}$
- Pressure Ratings: @ seal braze = 12 bar max
- IP ratings: 66
- Ratings O/P: 0 to 50 mV max

2. **Conax P/N 10-3637-011/-051/-061 (60Hz turbine) and 10-3639-031 (50Hz turbine) with Harting Connectors: "Flashback Thermocouple", Used on Siemens 9000 Series Turbine**

- 2.1. Consists of two thermocouples in a long slender Inconel tube of gradually increasing outer diameter. A cable assembly with multi-pin connector is attached at one end, the thermocouple junctions within the tube are at the other end.

Each of the two (2) thermocouples are Type "N", with isolated, ungrounded junctions, sealed within a tube. The first approximately 4 inches at the junction end houses both thermocouples within a 0.078" (1.98 mm) tube. This tube is fitted to a 0.125" (3.18 mm) diameter tube. An approximately 4.6 inch long section of 0.187" (1.75 mm) diameter outer support tube is fitted to this tube, beginning at a distance of approximately 25.5 inches from the junction end. These increasingly larger tubes are approximately 30.1 inches long overall. A flexible stainless steel cable extends an additional distance of approximately 59 inches past the tubes and terminates into a multi-pin connector. The wiring is supplied with a Type "N" extension cable assembly, 12 meters (472.5") long with a mating multi-pin Harting connector and terminating to pigtail.



2.2. Thermocouple Assembly described in Para. 2.1 is IECEx certified to:

- Ex ec IIC Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq T_a \leq +200^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+760^{\circ}\text{C}$
- Pressure Ratings: @ seal braze = 30 bar max
- IP ratings: 54
- Ratings O/P: 0 to 50 mV max

3. **Conax P/N 10-3631-011(60Hz Turbine) and 10-3633-031 (50Hz Turbine) w/Harting Connectors: "BladePath Thermocouple" used on Siemens 9000 Series Turbine**

3.1. Consists of three thermocouples in a long slender Inconel tube, having a stepped increase in diameter. A threaded fitting is provided at the end of the tube, which allows the assembly to be mounted into a process gas stream. A cable assembly with attached multi-pin connector exits the end of this fitting.

Three Type "N" isolated, ungrounded thermocouple junctions are exposed at the end of a 0.540" diameter tube with a 0.098 inch diameter tip. This tubular assembly is welded to an M24 X 3 mounting body to accommodate mounting to the turbine. The other end is provided with a bayonet type protection tube held with three 5mm hex bolts with a slot machined in the side of the pipe to permit passage of a cable assembly. The cable assembly, within a flexible stainless steel tube, terminates to a multi-pin Harting connector.

The assembly is supplied with a type "N" extension cable assembly, 12 meters (472.5") long with a mating Harting connector and terminating to a pigtail.3.2

3.2. Thermocouple Assembly described in Para. 3.1 is IECEx certified to:

- Ex ec IIC Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq T_a \leq +200^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+680^{\circ}\text{C}$
- Pressure Ratings: @ seal braze = 1.2 bar max
- IP ratings: 54
- Ratings O/P: 0 to 50 mV max



4. Conax P/N 10-3653-011(60Hz Turbine) and 10-3655-031 (50Hz Turbine) w/Harting Connectors: "Compressor Discharge" used on Siemens 9000 Series Turbine

4.1. Consists of three thermocouples in a long slender Inconel tube, having a stepped increase in diameter. A threaded fitting is provided at the end of the tube, which allows the assembly to be mounted into a process gas stream. A cable assembly with attached multi-pin connector exits the end of this fitting.

Two Type "N" isolated, ungrounded thermocouple junctions are exposed at the end of a 0.354" diameter tube. A metallic cage surrounds the exposed junction tips. This tube if fitted to the end of a 0.591" (15mm) diameter "thermowell" tube, which is welded to a machined assembly. This tubular assembly contains a spring tensioned telescopic arrangement that permits minor linear motion of the thermocouple tube. The process end is threaded on the outer diameter to accommodate mounting. The other end is provided with a SST metallic seal fitting that is connected to a 1.9" (50mm) hex standoff to permit passage of a mins/cable assembly. The cable assembly, within a flexible stainless steel tube, terminates to a multi-pin Harting connector. An installation tool is supplied for ease installing a replacement thermocouple.

The assembly is supplied with a type "N" extension cable assembly, 12 meters (472.5") long with a mating Harting connector and terminating to a pigtail.

4.2. Thermocouple Assembly described in Para. 4.1 is IECEx certified to:

- Ex ec IIC Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq T_a \leq +200^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+560^{\circ}\text{C}$
- Pressure Ratings: @ seal braze = 30 bar max
- IP ratings: 54
- Ratings O/P: 0 to 50 mV max



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Annex I

Thermocouple Assemblies

1.0 Conax P/N 10-3379-1(50 HZ Turbine) and P/N 10-3380-001 (60 HZ Turbine) - w/Terminal Head; "HMS2 Disc Cavity Thermocouple"

1.1 Consists of two thermocouples in a long slender Inconel tube. A wiring compartment enclosure, with high temperature terminal block is attached at one end, the thermocouple junctions sealed within the tube are at the other end.

Each of the two (2) thermocouple are a Type "K" with grounded hot junctions. The sheath is of Inconel 600 with an outer diameter of 0.125" (3.2 mm). This assembly is fitted within a 0.236(6.00 mm) SST overtube with a raised face mounting flange and terminating to a SST terminal head enclosure.

1.2 Thermocouple Assembly described in Para. 1.1 is IECEX certified to :

- Ex ec IIC Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq \text{Ta} \leq +260^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+1093^{\circ}\text{C}$
- Pressure Ratings: @ seal braze = 12 bar max
- IP ratings: 66
- Ratings O/P: 0 to 50 mV max

2 Conax P/N 10-3371-001/-002/-003 w/Harting Connectors: "Flashback Thermocouple"

2.1 Consists of two thermocouples in a long slender Inconel tube of gradually increasing outer diameter. A cable assembly with multi-pin connector is attached at one end, the thermocouple junctions within the tube are at the other end.

Each of the two (2) thermocouples are Type K, with isolated, ungrounded junctions, sealed within a tube. The first approximately 4 inches at the junction end houses both thermocouples within a 0.078" (1.98 mm) tube. This tube is fitted to a 0.125" (3.18 mm) diameter tube. An approximately 4.6 inch long section of 0.187" (1.75 mm) diameter outer support tube is fitted to this tube, beginning at a distance of approximately 23.7 inches from the junction end. These increasingly larger tubes are approximately 28.35 inches long overall. A flexible stainless steel cable extends an additional distance of approximately 59 inches past the tubes and terminates into a multi-pin connector.

The wiring is supplied with a Type "K" extension cable assembly, 12 meters (472.5") long with a mating multi-pin Harting connector and terminating to pigtail.



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2.2 Thermocouple Assembly described in Para. 2.1 is IECEx certified to:

- Ex ec IIC Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq \text{Ta} \leq +200^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+1093^{\circ}\text{C}$
- Pressure Ratings: @ seal braze = 30 bar max
- IP ratings: 54
- Ratings O/P: 0 to 50 mV max

3 Conax P/N 10-3381-001/-002/-003 w/Harting Connectors: "BladePath Thermocouple"

3.1 Consists of three thermocouples in a long slender Inconel tube, having a stepped increase in diameter. A threaded fitting is provided at the end of the tube, which allows the assembly to be mounted into a process gas stream. A cable assembly with attached multi-pin connector exits the end of this fitting.

Three Type "N" isolated, ungrounded thermocouple junctions are exposed at the end of a 0.375" diameter tube. A metallic cage surrounds the exposed junction tips. This tube is fitted to the end of a 0.984" (25 mm) diameter "thermowell" tube, which is welded to a machined assembly. This tubular assembly contains a spring-tensioned telescopic arrangement that permits minor linear motion of the thermocouple tube. The process end is threaded on the outer diameter to accommodate mounting. The other end is provided with 1 inch male NPT threads that connect to a pipe and cap, with a slot machined in the side of the pipe to permit passage of a cable assembly. The cable assembly, within a flexible stainless steel tube, terminates to a multi-pin Harting connector.

The assembly is supplied with a type "N" extension cable assembly, 12 meters (472.5") long with a mating Harting connector and terminating to a pigtail.

3.2 Thermocouple Assembly described in Para. 3.1 is IECEx certified to:

- Ex ec IIC Gc T6 to T2 with;
- Ambient Temperature: $-20^{\circ}\text{C} \leq \text{Ta} \leq +200^{\circ}\text{C}$
- Service Temperature at Sensor Tip: $+1093^{\circ}\text{C}$
- Pressure Ratings: @ seal braze = 1.2 bar max
- IP ratings: 54
- Ratings O/P: 0 to 50 mV max