CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1649904 (LR 20312) **Master Contract:** 203012

Project: 1793214 **Date Issued:** 2006/05/30

Issued to: **ABB Automation Products GmbH**

72 Schillerstrasse
Minden, 32425
Germany
Attention: Mr. Ralf Schaffer

The products listed below are eligible to bear the CSA Mark shown

Issued by: Marin Banu, P. Eng.

Authorized by: Patricia Pasemko, Operations Manager

PRODUCTS

CLASS 2258 04 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe, Entity - For Hazardous Locations

CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations

CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations

Class I, Div 2, Groups A, B, C and D; Class II, Div 2, Groups E, F and G; Class III; Encl. Type 4X:

· Model TZIDC-110 (P/N V18346-x032x2xx0x) and TZIDC-120 (P/N V18347-x042x2xx0x), TZIDC-210 (P/N V18349-x0x4x3xxxx) and TZIDC-220 (P/N V18350-x0x4x3xxxx), Positioner; input rated 32V dc max, 15mA max. (powered by a SELV circuit); Max Ambient 85 °C.

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Note 1: The "x" in P/N denotes minor mechanical variations or optional features.

Note 2: Local communication interface LKS shall not be used in hazardous location.

CLASS 2258 04 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations

Class I, Div. 1, Groups A, B, C and D; Class II, Div. 1, Groups E, F and G; Class III, Div. 1; Encl. Type 4X:

· Model TZIDC-110 (P/N V18346-x032x2xx0x) and TZIDC-120 (P/N V18347-x042x2xx0x), TZIDC-210 (P/N V18349-x0x4x3xxxx) and TZIDC-220 (P/N V18350-x0x4x3xxxx), Positioner; input rated 32Vdc max, 15mA max. (powered by a SELV circuit); intrinsically safe with entity parameters of: Terminals 11/12: Vmax = 24V, Imax = 250mA, Ci = 2.8nF, Li = 7.2uH; Terminals 85/86: Umax = 30V, Imax = 50mA Ci = 3.8nF, Li = 0uH; Terminals 41/42: Umax = 16V, Ii = 20mA, Ci =60nF, Li = 100uH; Terminals 51/52: Umax = 16V, Imax = 20mA, Ci = 60nF, Li = 100uH; when installed per installation Dwg. 901265; Temp. Code T4; Max Ambient 85 °C.

Note 1: The "x" in P/N denotes minor mechanical variations or optional features.

Note 2: Local communication interface LKS shall not be used in hazardous location.

Note 3: Each pair of conductors of each in intrinsic safety circuit shall be shielded.

APPLICABLE REQUIREMENTS

CAN/CSA Std C22.2 No. 94-M91 - Special Purpose Enclosures

CSA Std C22.2 No. 142-M1987 - Process Control Equipment

CAN/CSA Std C22.2 No. 157-92 - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations

CSA Std C22.2 No. 213-M1987 - Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations

CAN/CSA Std C22.2 No. 25-1966 - Enclosures for use in Class II Groups E, F and G Hazardous Location

CAN/CSA Std C22.2 No. 1010-92 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements

IEC 1010-2-071 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 2-071: Particular Requirements for Equipment Used in Extended Environments

MARKINGS

- CSA Monogram

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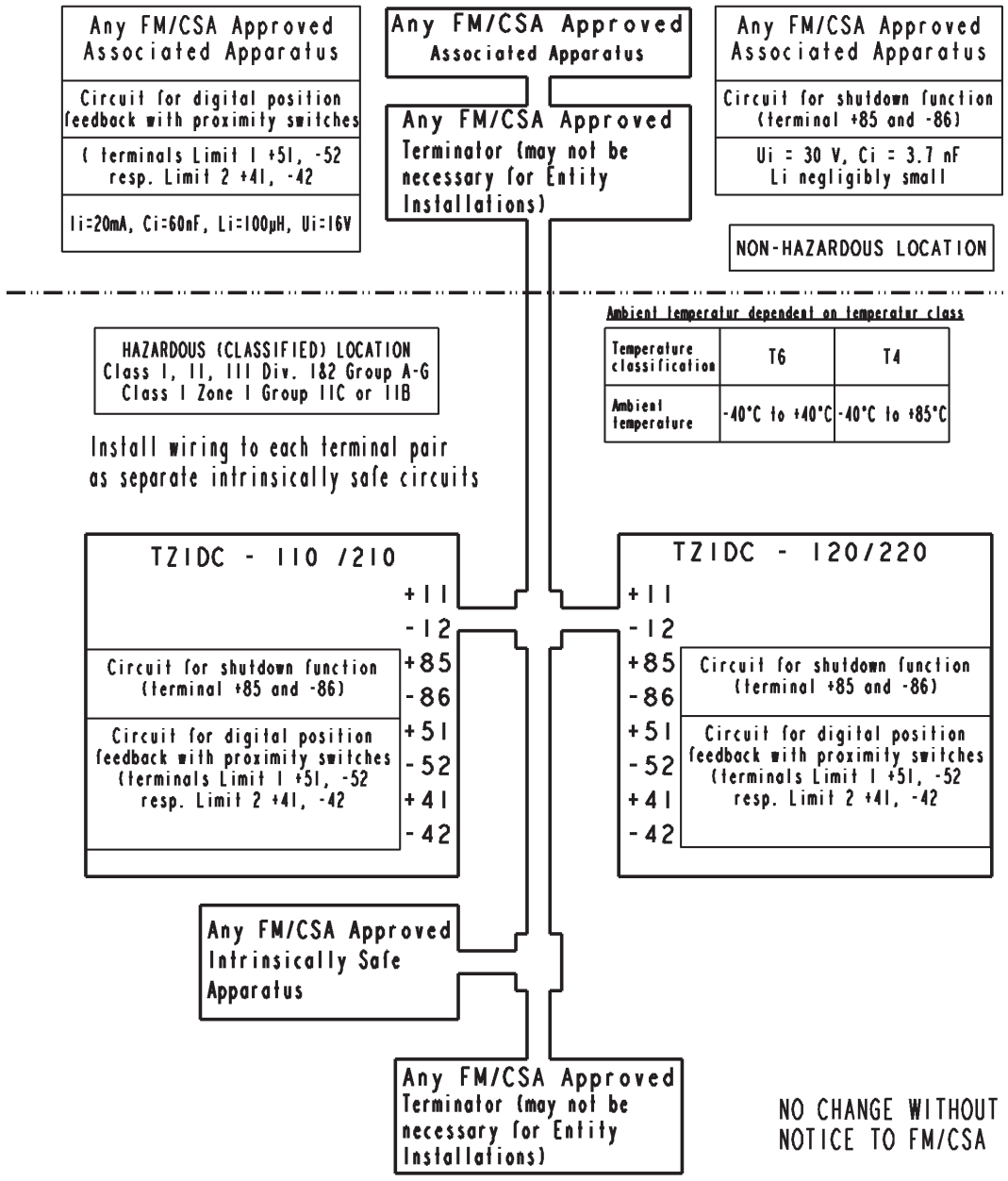
- Company Name
- Model number
- Serial number
- Electrical rating
- Hazardous Location designation
- Special purpose enclosure designation, "Type 4X"
- Max ambient
- The symbol "Exia"
- The words "INTRINSICALLY SAFE/SECURITE INTRINSEQUE"
- Reference to Installation Instructions
- A statement re Intrinsic Safety
- Caution statement re. Disconnection of circuits.

Fildbus	Concept	Groups	Vmax. (V)	Imax. (mA)	Pmax. (W)	Ci (nF)	Li (µH)
Terminals +11, -12	Entity	IIC / ABCDEFG	24	250	1.2	2.8	7.2
	FISCO	IIC / ABCDEFG	17.5	360	2.52		
	FISCO	IIB / CDEFG	17.5	380	5.32		



- -				2003	Date	Name	Title	Scale
				Name	27.03.03	Thiem.	FM/CSA-Control-Document	
				Appr.				/
5		08.07.11	Thie.	Std.				
4		07.10.09	Lasa.					
3		26.06.06	Thie.				Drwg.-No. (Part-No.)	
2		22.05.06	Thie.				901265	
1		27.03.	Thie.	Automation Products				
Rev.	Chang	Date	Name				Supersedes Dwg. :	Part Class:

FM/CSA-CONTROL-DOCUMENT_901265

FISCO rules

The FISCO Concept allows the interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criterion for such interconnection is that the voltage (Vmax), the current (Imax) and the power (Pi) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (Uo, Voc, Vt), the current (Io, Isc, It,) and the power (Po) which can be provided by the associated apparatus (supply unit). In addition, the maximum unprotected residual capacitance (Ci) and inductance(Li) of each apparatus (other than the terminators) connected to the Fieldbus must be less than or equal to 5nF and 10 µH respectively.

In each I.S. Fieldbus segment only one active sourca, nomally the associated apparatus, is allowed to provide the necessary power for the Fieldbus system. The allowed voltage (Uo, Voc, Vt) of the associated apparatus used to supply the bus must be limited to the range of 14V d.c. to 24V d.c. All other equipment connected to the bus cable has to be passive, meaning that the apparatus is 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 insure that the intrinsically safe Fieldbus circuit remains passive.

The cable used to interconnect the devices needs to comply with the following parameters:

Loop resistance R': 15…150 Ω/km

Inductance per unit length L': 0.4…1mH/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: max. 30m

Length of trunk cable: max. 1km

Length of splice: max. 1m

Terminators

At each end of the trunk cable an approved line terminator with the following parameters is suitable:

R = 90…100 Ω

C = 0…2.2 µF.

System evaluation

The number of passive devices like transmitters, actuators, connected to a single bus segment is not limited due to I.S. Reasons. Furthemore, if the above rules are respected, the inductance and capacitance of the cable need not to be considered and will not impair the intrinsic safety of the installation.

Rev.	Chang	Date	Name
- -			
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ABB

Automation Products

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Drwg.-No. (Part-No.): **901265**

Supersedes Dwg. :

Part Class:

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Installation Notes For FISCO and Entity Concepts:

1. The Intrinsic Safety Entity concept allows the interconnection of FM/CSA Approved Intrinsically safe devices with entity parameters not specifically examined in combination as a system when:
   Uo or Voc or Vt ≤ Vmax, Io or Isc or It ≤ Imax, Po ≤ Pi. Ca or Co ≥ ∑Ci + ∑C cable.
   For inductance use either La or Lo ≥ ∑Li + ∑L cable or Lc / Rc ≤ (La / Ra or Lo / Ro) and Li / Ri ≤ (La / Ra or Lo / Ro)
2. The Intrinsic Safety FISCO concept allows the interconnecting of FM/CSA Approved Intrinsically safe devices with FISCO parameters not specifically examine in combination as a system when: Uo or Voc or Vt ≤ Vmax., Io or Isc or It ≤ Imax, Po ≤ Pi.
3. Control equipment connected to the Associated Apparatus must not use or generate more than 250 Vrms or Vdc.
4. Installation should be in accordance with ANSI/ISA RP12.6 (except chapter 5 for FISCO Installations) "Installation of Intrinsically Safe System for Hazardous (Classified) Locations" and the National Electrical Code® (ANSI/NFPA 70) Sections 504 and 505.
5. The configuration of associated Apparatus must be Factory Mutual Research /Canadian Standards Association Approved under the associated concept.
6. Associated Apparatus manufacturer's installation drawing must be followed when installing this equipment.
7. No revision to drawing without prior Factory Mutual Research Approval/Canadian Standards Association.
8. Special conditions for safe use
   The operation of the local communication interface (LKS) and of the programming interface (X5) is only allowed outside of the Hazardous explosive area.
9. Caution: Substitution of components may impair intrinsic safety.
10. Preventing electrostatic charging
    Due to the possibility of impermissible electrostatic charging of the housing occurring, the effects of high-voltage sources on the equipment must be prevented. Electrostatic charging can also occur if the device is wiped with a dry cloth or if large amounts of dust flow around the device in dusty environments. To prevent charging of this type from occurring, the device may only be cleaned using a damp cloth. Dust flowing round the device should be prevented by installing a flow restrictor or partition.

NONINCENDIVE, CLASS I, DIV. 2, GROUP A, B, C, D, AND FOR CLASS II AND III, DIV. 1&2, GROUP E, F, G
HAZARDOUS LOCATIONS INSTALLATION.

1. Install per National Electrical Code (NEC) using threaded metal conduit. Intrinsic safety barrier required, Max. Supply voltage 30 V. For T-code see table.

2. A dust tight seal must be used at the conduit entry when the positioner is used in a Class II & III Location.

3. WARNING: Explosion Hazard - do not disconnect equipment unless power has been switched off or the area is known to be Non-Hazardous.
   WARNING: Substitution of components may impair suitability for hazardous locations.

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