FM Approvals
Member of the FM Global Group

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CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

TZIDC-110 Positioner. Model V18346-a032b2cd0e.
TZIDC-120 Positioner. Model V18347- a042b2cd0e
IS/I,II,III/1/ABCDEFG/T6,T5,T4 Ta = 40°C, 55°C, 85°C–901265 Entity, FISCO

Entity and FISCO Parameters							
Terminals	Type	Groups	Parameters				
			Vmax	Imax	Pi	Ci	Li
+11, -12	Entity	A-G	24V	250 mA	1.2 W	2.8 nF	7.2 uH
+11, -12	FISCO	A-G	17.5V	360 mA	2.52 W	2.8 nF	7.2 uH
+11, -12	FISCO	C-G	17.5V	380 mA	5.32 W	2.8 nF	7.2 uH
+51, -52	Entity	A-G	16V	20 mA	-	60 nF	100 uH
+41, -42	Entity	A-G	16V	20 mA	-	60 nF	100 uH
+85, -86	Entity	A-G	30V	-	-	3.7 nF	< 1 uH

NI/I/2/ABCD/T6,T5,T4 Ta = 40°C, 55°C, 85°C
S/II,III/2/EFG/ T6,T5,T4 Ta = 40°C, 55°C, 85°C
Enclosure type 4X
a = Case/mounting - 1, 2, 5 or 6
b = Output/safe protection - 1, 2, 4 or 5
c = Option modules (shutdown) – 0 or 4
d = Optional mechanical kit for digital position feedback – 0, 1 or 3
e = Design (varnish/coding) - 1 or E

TZIDC-210 Positioner. Model V18349-a014b3cd3ef.
TZIDC-220 Positioner. Model V18350- a014b3cd4ef.
IS/I,II,III/1/ABCDEFG/T6,T5,T4 Ta = 40°C, 55°C, 85°C–901265 Entity, FISCO

Terminals	Type	Groups	Parameters				
			Vmax	Imax	Pi	Ci	Li
+11, -12	Entity	A-G	24V	250 mA	1.2 W	2.8 nF	7.2 uH
+11, -12	FISCO	A-G	17.5V	360 mA	2.52 W	2.8 nF	7.2 uH
+11, -12	FISCO	C-G	17.5V	380 mA	5.32 W	2.8 nF	7.2 uH
+51, -52	Entity	A-G	16V	20 mA	-	60 nF	100 uH
+41, -42	Entity	A-G	16V	20 mA	-	60 nF	100 uH
+85, -86	Entity	A-G	30V	-	-	3.7 nF	< 1 uH

NI/I/2/ABCD/T6,T5,T4 Ta = 40°C, 55°C, 85°C
S/II,III/2/EFG/ T6,T5,T4 Ta = 40°C, 55°C, 85°C
Enclosure type 4X
a = Case/mounting - 1, 2, 3, 4, 5 or 6
b = Output/safe protection - 1, 2, 3 or 4
c = Option modules (shutdown) – 0 or 5
d = Optional mechanical kit for digital position feedback – 0, 1 or 2
e = Design (varnish/coding) - 1 or 2
f = Device identification label - 0, 1 or 2

TZIDC-210 Positioner. Model V18349-a012b3cd3ef.
TZIDC-220 Positioner. Model V18350- a012b3cd4ef.
XP/I/2/CD/T6,T5,T4 Ta = 82°C
DIP/II,III/2/FG/ T6,T5,T4 Ta = 82°C
Enclosure type 4X
a = Case/mounting - 1, 2, 3, 4, 5 or 6
b = Output/safe protection - 1, 2, 3 or 4
c = Option modules (shutdown) – 0 or 5
d = Optional mechanical kit for digital position feedback – 0, 1 or 2
e = Design (varnish/coding) - 1 or 2
f = Device identification label - 0, 1 or 2

Equipment Ratings:

TZIDC-110, TZIDC-120, TZIDC-210 and TZIDC-220 Positioners: intrinsically safe, Entity and FISCO, for Class I, II and III, Division 1, applicable Groups A, B, C, D, E, F, G; nonincendive for Class I, Division 2, Groups A, B, C and D; suitable for Class II and III, Division 2, Groups E, F and G hazardous (classified) indoor and outdoor NEMA 4X locations. The following temperature code ratings were assigned for the equipment and protection methods described above:

T6 in ambient temperatures of 40°C
T5 in ambient temperatures of 55°C
T4 in ambient temperatures of 85°C

TZIDC-210 and TZIDC-220 Positioners: explosionproof for Class I, Division 1, Groups C and D, in an ambient of 82°C; dust-ignitionproof for Class II and III, Division 1, Groups E, F and G, in an ambient of 82°C hazardous (classified) indoor and outdoor NEMA 4X locations.

FM Approved for:

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ABB Automation Products GmbH
D-32425 Minden, Germany

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This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600	1998
Class 3611	2004
Class 3615	1989
Class 3810	2005
NEMA 250	1991

Original Project ID: 3022748 Approval Granted: August 2, 2006

Subsequent Revision Reports / Date Approval Amended

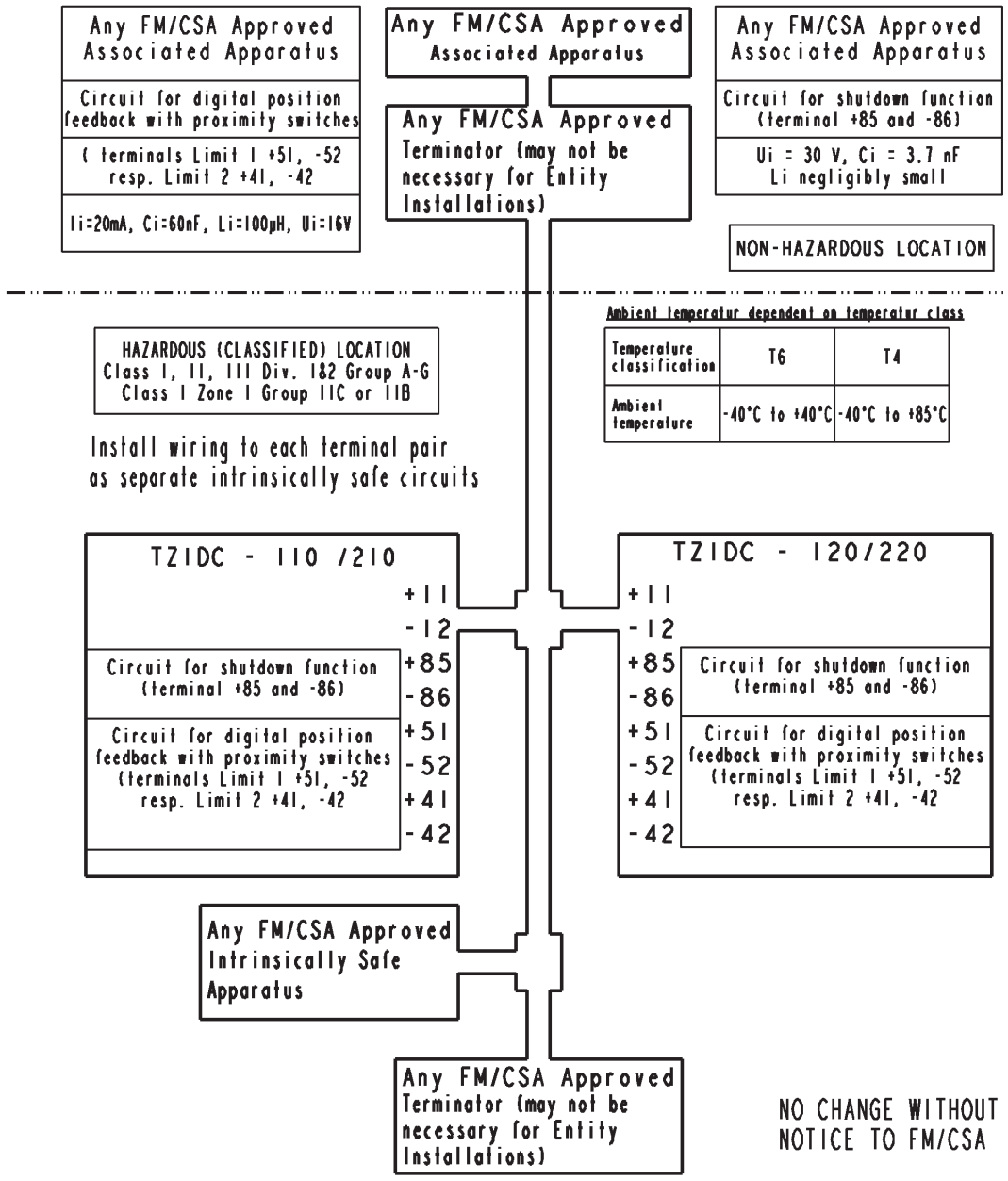
Report Number	Date	Report Number	Date

FM Approvals LLC

Robert L. Martell, Jr.
Assistant Vice President

Aug 2, 2006
Date

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
- -			
5		08.07.11	Thie.
4		07.10.09	Lasa.
3		26.06.06	Thie.
2		22.05.06	Thie.
1		27.03.	Thie.

2003	Date	Name
Name	27.03.03	Thiem.
Appr.		
Std.		

ABB

Automation Products

Title: FM/CSA-Control-Document

Scale: /

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

Supersedes Dwg. :

Part Class:

FM/CSA-CONTROL-DOCUMENT_901265

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.

- -				2003	Date	Name	Title	Scale
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