

CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** FM19US0058X
3. **Equipment:** 9116A Universal Converter
(Type Reference and Name) 9116B Universal Converter
4. **Name of Listing Company:** PR electronics A/S
5. **Address of Listing Company:** Lerbakken 10
Roende
DK-8410
Denmark
6. The examination and test results are recorded in confidential report number:

3038267 dated 23rd April 2010
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

FM Class 3600:2018, FM Class 3610:2018, FM Class 3611:2018, FM Class 3810:2018,
ANSI/ISA-12.12.01-2015, ANSI/ISA 60079-0:20013, ANSI/ISA 60079-11:2014, ANSI/ISA 60079-15:2013,
ANSI/ISA 61010-1:2012
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

Certificate issued by:

J. E. Marquedant
VP, Manager, Electrical Systems

28 June 2019

Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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SCHEDULE



US Certificate Of Conformity No: FM19US0058X

10. Equipment Ratings:

9116A

Nonincendive for use in Class I, Division 2, Groups A, B, C, D Hazardous (Classified) Locations.
Nonsparking for use in Class I, Zone 2, Group IIC Hazardous (Classified) Locations.

9116B

Nonincendive for use in Class I, Division 2, Groups A, B, C, D with intrinsically safe connections to Classes I, II, III, Division 1, Groups A, B, C, D, E, F, G Hazardous (Classified) Locations. Nonsparking for use in Class I, Zone 2, Group IIC with intrinsically safe connections to Class I, Zone 0, Groups IIC Hazardous (Classified) Locations.

11. The marking of the equipment shall include:

9116A

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

Class I, Zone 2, AEx nA nC IIC T4

Ta = -20°C to +60°C

9116B

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

Provides IS outputs to Class I, II, III, Division 1, Groups A, B, C, D, E, F, G

Class I, Zone 0, AEx [ia] IIC

Class I, Zone 2, AEx nA nC [ia] IIC T4

Ta = -20°C to +60°C

Installation Drawing: 9116QF01

12. **Description of Equipment:**

General – The 9116 Universal Converter is designed for industrial and Hazardous (Classified) Location applications. The 9116 Universal Converter is supplied via terminals at the front of the module or via Power Rail Type 9400. A removal display module 4501 can be used for programming of the Pulse Isolator. The galvanic isolation between the intrinsic safe circuits and the non-intrinsic safe circuits is done with three transformers. The 9116 Universal Converter is designed to be installed in a closed locked equipment cabinet providing a degree of protection of at least IP54. Cable entry devices and blanking elements shall fulfill the same requirements.

Ratings - The equipment is rated for use in a process temperature range of -20°C to +60°C.

9116Aa Universal Converter

a = version (A= 1; B = 2)

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SCHEDULE



US Certificate Of Conformity No: FM19US0058X

9116Ba Universal Converter

a = version (A= 1; B = 2)

I. Entity Parameters for either Model 9116B1 or Model 9116B2 connected to a Simple Apparatus or an Intrinsically Safe Apparatus:

Model 9116B1

Terminals 51-52, 51-53

Input: $U_i (V_{max}) = 30 \text{ V}$, $I_i (I_{max}) = 120 \text{ mA}$, $P_i = 900 \text{ mW}$, $C_i = 3 \text{ nF}$, $L_i = 1 \text{ } \mu\text{H}$

Terminals 51-54, 52-54

Output: $U_o (V_{oc}) = 28 \text{ V}$, $I_o (I_{sc}) = 93 \text{ mA}$, $P_o = 650 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 80 \text{ nF}$	$L_o (L_a) = 4 \text{ mH}$	$L_o/R_o = 54 \text{ } \mu\text{H}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 640 \text{ nF}$	$L_o (L_a) = 16 \text{ mH}$	$L_o/R_o = 218 \text{ } \mu\text{H}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 2.1 \text{ } \mu\text{F}$	$L_o (L_a) = 32 \text{ mH}$	$L_o/R_o = 436 \text{ } \mu\text{H}/\Omega$

Terminals 51-53

Output: $U_o (V_{oc}) = 28 \text{ V}$, $I_o (I_{sc}) = 1.1 \text{ mA}$, $P_o = 8 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 80 \text{ nF}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 4 \text{ mH}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 640 \text{ nF}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 17 \text{ mH}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 2.1 \text{ } \mu\text{F}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 35 \text{ mH}/\Omega$

Terminals 51-52

Output: $U_o (V_{oc}) = 8.3 \text{ V}$, $I_o (I_{sc}) = 0.2 \text{ mA}$, $P_o = 0.4 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 7 \text{ } \mu\text{F}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 100 \text{ mH}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 73 \text{ } \mu\text{F}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 400 \text{ mH}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 1000 \text{ } \mu\text{F}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 800 \text{ mH}/\Omega$

Terminals 41, 42, 43, 44

Output: $U_o (V_{oc}) = 8.3 \text{ V}$, $I_o (I_{sc}) = 13.1 \text{ mA}$, $P_o = 27.3 \text{ mW}$

Class I, Zone 0, Group IIC	$C_o (C_a) = 7 \text{ } \mu\text{F}$	$L_o (L_a) = 207 \text{ mH}$	$L_o/R_o = 1 \text{ mH}/\Omega$
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Class I, Division 1, Groups A & B			
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	Co (Ca) = 73 μ F	Lo (La) = 828 mH	Lo/Ro = 5 mH/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	Co (Ca) = 1000 μ F	Lo (La) = 1 H	Lo/Ro = 10 mH/ Ω

Model 9116B2

Terminals 51-52, 51-53

Input: U_i (V_{max}) = 30 V, I_i (I_{max}) = 120 mA, P_i = 900 mW, C_i = 3 nF, L_i = 1 μ H

Terminals 51-54, 52-54

Output: U_o (V_{oc}) = 21.4 V, I_o (I_{sc}) = 93 mA, P_o = 650 mW

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	Co (Ca) = 0.16 μ F	Lo (La) = 4 mH	Lo/Ro = 54 μ H/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	Co (Ca) = 1.13 μ F	Lo (La) = 16 mH	Lo/Ro = 218 μ H/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	Co (Ca) = 4.15 μ F	Lo (La) = 32 mH	Lo/Ro = 436 μ H/ Ω

Terminals 51-53

Output: U_o (V_{oc}) = 21.4 V, I_o (I_{sc}) = 1.1 mA, P_o = 8 mW

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	Co (Ca) = 0.16 μ F	Lo (La) = 1 H	Lo/Ro = 4 mH/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	Co (Ca) = 1.13 μ F	Lo (La) = 1 H	Lo/Ro = 17 mH/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	Co (Ca) = 4.15 μ F	Lo (La) = 1 H	Lo/Ro = 35 mH/ Ω

Terminals 51-52

Output: U_o (V_{oc}) = 8.3 V, I_o (I_{sc}) = 0.2 mA, P_o = 0.4 mW

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	Co (Ca) = 7 μ F	Lo (La) = 1 H	Lo/Ro = 100 mH/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	Co (Ca) = 73 μ F	Lo (La) = 1 H	Lo/Ro = 400 mH/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	Co (Ca) = 1000 μ F	Lo (La) = 1 H	Lo/Ro = 800 mH/ Ω

Terminals 41, 42, 43, 44

Output: U_o (V_{oc}) = 8.3 V, I_o (I_{sc}) = 13.1 mA, P_o = 27.3 mW

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Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	Co (Ca) = 7 μ F	Lo (La) = 207 mH	Lo/Ro = 1 mH/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	Co (Ca) = 73 μ F	Lo (La) = 828 mH	Lo/Ro = 5 mH/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	Co (Ca) = 1000 μ F	Lo (La) = 1 H	Lo/Ro = 10 mH/ Ω

II. Entity Parameters for two Models 9116B1 or Models 9116B2 connected to a Loop-powered transmitter:

Model 9116B1 or Model 9116B2

Terminals 52-54

Input: $U_i (V_{max}) = 30$ V, $I_i (I_{max}) = 120$ mA, $P_i = 900$ mW, $C_i = 3$ nF, $L_i = 2$ μ H

Model 9116B1

Terminals 52-54

Output: $U_o (V_{oc}) = 28$ V, $I_o (I_{sc}) = 93$ mA, $P_o = 650$ mW

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	Co (Ca) = 80 nF	Lo (La) = 4 mH	Lo/Ro = 54 μ H/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	Co (Ca) = 640 nF	Lo (La) = 16 mH	Lo/Ro = 218 μ H/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	Co (Ca) = 2.1 μ F	Lo (La) = 32 mH	Lo/Ro = 436 μ H/ Ω

Model 9116B2

Terminals 52-54

Output: $U_o (V_{oc}) = 21.4$ V, $I_o (I_{sc}) = 93$ mA, $P_o = 650$ mW

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	Co (Ca) = 0.16 μ F	Lo (La) = 4 mH	Lo/Ro = 54 μ H/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	Co (Ca) = 1.13 μ F	Lo (La) = 16 mH	Lo/Ro = 218 μ H/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	Co (Ca) = 4.15 μ F	Lo (La) = 32 mH	Lo/Ro = 436 μ H/ Ω

III. Entity Parameters for two Models 9116B1 or Models 9116B2 connected in series to a current source

Model 9116B1 or Model 9116B2

Terminals 51,52

Input: $U_i (V_{max}) = 30$ V, $I_i (I_{max}) = 120$ mA, $P_i = 900$ mW, $C_i = 3$ nF, $L_i = 2$ μ H

Output: $U_o (V_{oc}) = 16.6$ V, $I_o (I_{sc}) = 0.2$ mA, $P_o = 0.8$ mW

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US Certificate Of Conformity No: FM19US0058X

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	Co (Ca) = 0.4 μ F	Lo (La) = 100 mH	Lo/Ro = 25 mH/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	Co (Ca) = 2.3 μ F	Lo (La) = 100 mH	Lo/Ro = 100 mH/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	Co (Ca) = 9.5 μ F	Lo (La) = 100 mH	Lo/Ro = 200 mH/ Ω

IV. Unclassified or Division 2 / Zone 2 hazardous (classified) location parameters for Model 9116B1 or Model 9116B2

Status Relay, Terminal (33, 34)

Unclassified location installation:

Voltage max: 125 V_{AC} / 110 V_{DC}

Power max: 62.5 VA / 32 W

Current max: 0.5 A_{AC} / 0.3 A_{DC}

Zone 2 installation:

Voltage max: 32 V_{AC} / 32 V_{DC}

Power max: 16 VA / 32 W

Current max: 0.5 A_{AC} / 1 A_{DC}

Relay Output. Terminal (13,14)

Unclassified location installation:

Voltage max: 250 V_{AC} / 30 V_{DC}

Power max: 500 VA / 60 W

Current max: 2 A_{AC} / 2 A_{DC}

Zone 2 installation:

Voltage max: 32 V_{AC} / 30 V_{DC}

Power max: 64 VA / 60 W

Current max: 2 A_{AC} / 2 A_{DC}

13. Specific Conditions of Use:

1. In Class I, Division 2 installations, the subject equipment shall be mounted within a too-secured enclosure which is capable of accepting one or more of the Class I, Division 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70).
2. In Class I, Zone 2 installations, the subject equipment shall be mounted within a tool secured enclosure which is capable of accepting one or more of the Class I, Zone 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70). Where installed in outdoor or potentially wet locations, the enclosure shall, at a minimum, meet the requirements of IP54.
3. In Class I, Zone 2 installations, the installer shall ensure protection of supply terminals against transient voltages exceeding 140% of the rated supply voltage.
4. Install in environments rated Pollution Degree 2 or better; overvoltage category I or II.

14. Test and Assessment Procedure and Conditions:

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US Certificate Of Conformity No: FM19US0058X

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
28 th June 2019	<u>Supplement 2:</u> Report Reference: - PR452213 dated 28 th June 2019 Description of the Change: Update the standards to current editions. Add 9116A model variation. Update certificate to latest format.

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CERTIFICATE OF CONFORMITY



1. **HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS**

- 2. **Certificate No:** **FM19CA0031X**
- 3. **Equipment:** **9116A Universal Converter**
(Type Reference and Name) **9116B Universal Converter**

4. **Name of Listing Company:** **PR electronics A/S**

5. **Address of Listing Company:** **Lerbakken 10**
Roende
DK-8410
Denmark

6. The examination and test results are recorded in confidential report number:

3038267 dated 23rd April 2010

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

CSA-C22.2 No. 213-2015, CSA-C22.2 No. 60079-0:2015, CSA-C22.2 No. 60079-11:2014,
CSA-C22.2 No. 60079-15: 2016, CAN/CSA-C22.2 No. 61010-1:2012

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

10. Equipment Ratings:

9116A

Nonincendive for use in Class I, Division 2, Groups A, B, C, D Hazardous Locations. Nonsparking for use in Group IIC Gc Hazardous Locations.

Certificate issued by:

J.E. Marquedant
VP, Manager, Electrical Systems

28 June 2019

Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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SCHEDULE



Canadian Certificate Of Conformity No: FM19CA0031X

9116B Nonincendive for use in Class I, Division 2, Groups A, B, C, D with intrinsically safe connections to Classes I, II, III, Division 1, Groups A, B, C, D, E, F, G Hazardous Locations; Nonsparking for use in Group IIC Gc with intrinsically safe connections to Groups IIC Ga Hazardous Locations.

11. The marking of the equipment shall include:

9116A

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

Ex nA nC IIC T4 Gc

Ta = -20°C to +60°C

9116B

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

Provides IS outputs to Class I, II, III, Division 1, Groups A, B, C, D, E, F, G

Ex [ia Ga] IIC

Ex nA nC [ia Ga] IIC T4 Gc

Ta = -20°C to +60°C

Installation Drawing: 9116QF01

12. **Description of Equipment:**

General – The 9116 Universal Converter is designed for industrial and Hazardous (Classified) Location applications. The 9116 Universal Converter is supplied via terminals at the front of the module or via Power Rail Type 9400. A removal display module 4501 can be used for programming of the Pulse Isolator. The galvanic isolation between the intrinsic safe circuits and the non-intrinsic safe circuits is done with three transformers. The 9116 Universal Converter is designed to be installed in a closed locked equipment cabinet providing a degree of protection of at least IP54. Cable entry devices and blanking elements shall fulfill the same requirements.

Ratings - The equipment is rated for use in a process temperature range of -20°C to +60°C.

9116Aa Universal Converter

a = version (A= 1; B = 2)

9116Ba Universal Converter

a = version (A= 1; B = 2)

I. Entity Parameters for either Model 9116B1 or Model 9116B2 connected to a Simple Apparatus or an Intrinsically Safe Apparatus:

Model 9116B1

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Canadian Certificate Of Conformity No: FM19CA0031X

Terminals 51-52, 51-53

Input: $U_i (V_{max}) = 30 \text{ V}$, $I_i (I_{max}) = 120 \text{ mA}$, $P_i = 900 \text{ mW}$, $C_i = 3 \text{ nF}$, $L_i = 1 \text{ } \mu\text{H}$

Terminals 51-54, 52-54

Output: $U_o (V_{oc}) = 28 \text{ V}$, $I_o (I_{sc}) = 93 \text{ mA}$, $P_o = 650 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 80 \text{ nF}$	$L_o (L_a) = 4 \text{ mH}$	$L_o/R_o = 54 \text{ } \mu\text{H}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 640 \text{ nF}$	$L_o (L_a) = 16 \text{ mH}$	$L_o/R_o = 218 \text{ } \mu\text{H}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 2.1 \text{ } \mu\text{F}$	$L_o (L_a) = 32 \text{ mH}$	$L_o/R_o = 436 \text{ } \mu\text{H}/\Omega$

Terminals 51-53

Output: $U_o (V_{oc}) = 28 \text{ V}$, $I_o (I_{sc}) = 1.1 \text{ mA}$, $P_o = 8 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 80 \text{ nF}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 4 \text{ mH}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 640 \text{ nF}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 17 \text{ mH}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 2.1 \text{ } \mu\text{F}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 35 \text{ mH}/\Omega$

Terminals 51-52

Output: $U_o (V_{oc}) = 8.3 \text{ V}$, $I_o (I_{sc}) = 0.2 \text{ mA}$, $P_o = 0.4 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 7 \text{ } \mu\text{F}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 100 \text{ mH}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 73 \text{ } \mu\text{F}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 400 \text{ mH}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 1000 \text{ } \mu\text{F}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 800 \text{ mH}/\Omega$

Terminals 41, 42, 43, 44

Output: $U_o (V_{oc}) = 8.3 \text{ V}$, $I_o (I_{sc}) = 13.1 \text{ mA}$, $P_o = 27.3 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 7 \text{ } \mu\text{F}$	$L_o (L_a) = 207 \text{ mH}$	$L_o/R_o = 1 \text{ mH}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 73 \text{ } \mu\text{F}$	$L_o (L_a) = 828 \text{ mH}$	$L_o/R_o = 5 \text{ mH}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 1000 \text{ } \mu\text{F}$	$L_o (L_a) = 1 \text{ H}$	$L_o/R_o = 10 \text{ mH}/\Omega$

Model 9116B2

Terminals 51-52, 51-53

Input: $U_i (V_{max}) = 30 \text{ V}$, $I_i (I_{max}) = 120 \text{ mA}$, $P_i = 900 \text{ mW}$, $C_i = 3 \text{ nF}$, $L_i = 1 \text{ } \mu\text{H}$

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SCHEDULE



Canadian Certificate Of Conformity No: FM19CA0031X

Terminals 51-54, 52-54

Output: U_o (Voc) = 21.4 V, I_o (Isc) = 93 mA, P_o = 650 mW

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	C_o (Ca) = 0.16 μ F	L_o (La) = 4 mH	L_o/R_o = 54 μ H/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	C_o (Ca) = 1.13 μ F	L_o (La) = 16 mH	L_o/R_o = 218 μ H/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	C_o (Ca) = 4.15 μ F	L_o (La) = 32 mH	L_o/R_o = 436 μ H/ Ω

Terminals 51-53

Output: U_o (Voc) = 21.4 V, I_o (Isc) = 1.1 mA, P_o = 8 mW

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	C_o (Ca) = 0.16 μ F	L_o (La) = 1 H	L_o/R_o = 4 mH/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	C_o (Ca) = 1.13 μ F	L_o (La) = 1 H	L_o/R_o = 17 mH/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	C_o (Ca) = 4.15 μ F	L_o (La) = 1 H	L_o/R_o = 35 mH/ Ω

Terminals 51-52

Output: U_o (Voc) = 8.3 V, I_o (Isc) = 0.2 mA, P_o = 0.4 mW

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	C_o (Ca) = 7 μ F	L_o (La) = 1 H	L_o/R_o = 100 mH/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	C_o (Ca) = 73 μ F	L_o (La) = 1 H	L_o/R_o = 400 mH/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	C_o (Ca) = 1000 μ F	L_o (La) = 1 H	L_o/R_o = 800 mH/ Ω

Terminals 41, 42, 43, 44

Output: U_o (Voc) = 8.3 V, I_o (Isc) = 13.1 mA, P_o = 27.3 mW

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	C_o (Ca) = 7 μ F	L_o (La) = 207 mH	L_o/R_o = 1 mH/ Ω
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	C_o (Ca) = 73 μ F	L_o (La) = 828 mH	L_o/R_o = 5 mH/ Ω
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	C_o (Ca) = 1000 μ F	L_o (La) = 1 H	L_o/R_o = 10 mH/ Ω

II. Entity Parameters for two Models 9116B1 or Models 9116B2 connected to a Loop-powered

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Canadian Certificate Of Conformity No: FM19CA0031X

transmitter:

Model 9116B1 or Model 9116B2

Terminals 52-54

Input: $U_i (V_{max}) = 30 \text{ V}$, $I_i (I_{max}) = 120 \text{ mA}$, $P_i = 900 \text{ mW}$, $C_i = 3 \text{ nF}$, $L_i = 2 \text{ } \mu\text{H}$

Model 9116B1

Terminals 52-54

Output: $U_o (V_{oc}) = 28 \text{ V}$, $I_o (I_{sc}) = 93 \text{ mA}$, $P_o = 650 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 80 \text{ nF}$	$L_o (L_a) = 4 \text{ mH}$	$L_o/R_o = 54 \text{ } \mu\text{H}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 640 \text{ nF}$	$L_o (L_a) = 16 \text{ mH}$	$L_o/R_o = 218 \text{ } \mu\text{H}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 2.1 \text{ } \mu\text{F}$	$L_o (L_a) = 32 \text{ mH}$	$L_o/R_o = 436 \text{ } \mu\text{H}/\Omega$

Model 9116B2

Terminals 52-54

Output: $U_o (V_{oc}) = 21.4 \text{ V}$, $I_o (I_{sc}) = 93 \text{ mA}$, $P_o = 650 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 0.16 \text{ } \mu\text{F}$	$L_o (L_a) = 4 \text{ mH}$	$L_o/R_o = 54 \text{ } \mu\text{H}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 1.13 \text{ } \mu\text{F}$	$L_o (L_a) = 16 \text{ mH}$	$L_o/R_o = 218 \text{ } \mu\text{H}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 4.15 \text{ } \mu\text{F}$	$L_o (L_a) = 32 \text{ mH}$	$L_o/R_o = 436 \text{ } \mu\text{H}/\Omega$

III. Entity Parameters for two Models 9116B1 or Models 9116B2 connected in series to a current source

Model 9116B1 or Model 9116B2

Terminals 51,52

Input: $U_i (V_{max}) = 30 \text{ V}$, $I_i (I_{max}) = 120 \text{ mA}$, $P_i = 900 \text{ mW}$, $C_i = 3 \text{ nF}$, $L_i = 2 \text{ } \mu\text{H}$

Output: $U_o (V_{oc}) = 16.6 \text{ V}$, $I_o (I_{sc}) = 0.2 \text{ mA}$, $P_o = 0.8 \text{ mW}$

Class I, Zone 0, Group IIC Class I, Division 1, Groups A & B	$C_o (C_a) = 0.4 \text{ } \mu\text{F}$	$L_o (L_a) = 100 \text{ mH}$	$L_o/R_o = 25 \text{ mH}/\Omega$
Class I, Zone 0, Group IIB Class I & II, Division 1, Groups C & E	$C_o (C_a) = 2.3 \text{ } \mu\text{F}$	$L_o (L_a) = 100 \text{ mH}$	$L_o/R_o = 100 \text{ mH}/\Omega$
Class I, Zone 0, Group IIA Class I, II, III Division 1, Groups D, F, & G	$C_o (C_a) = 9.5 \text{ } \mu\text{F}$	$L_o (L_a) = 100 \text{ mH}$	$L_o/R_o = 200 \text{ mH}/\Omega$

IV. Unclassified or Division 2 / Zone 2 hazardous (classified) location parameters for Model 9116B1

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Canadian Certificate Of Conformity No: FM19CA0031X

or Model 9116B2

Status Relay, Terminal (33, 34)

Unclassified location installation:

Voltage max: 125 V_{AC} / 110 V_{DC}

Power max: 62.5 VA / 32 W

Current max: 0.5 A_{AC} / 0.3 A_{DC}

Zone 2 installation:

Voltage max: 32 V_{AC} / 32 V_{DC}

Power max: 16 VA / 32 W

Current max: 0.5 A_{AC} / 1 A_{DC}

Relay Output. Terminal (13,14)

Unclassified location installation:

Voltage max: 250 V_{AC} / 30 V_{DC}

Power max: 500 VA / 60 W

Current max: 2 A_{AC} / 2 A_{DC}

Zone 2 installation:

Voltage max: 32 V_{AC} / 30 V_{DC}

Power max: 64 VA / 60 W

Current max: 2 A_{AC} / 2 A_{DC}

13. **Specific Conditions of Use:**

1. In Class I, Division 2 installations, the subject equipment shall be mounted within a too-secured enclosure which is capable of accepting one or more of the Class I, Division 2 wiring methods specified in the Canadian Electrical Code (C22.1).
2. In Zone 2 installations, the subject equipment shall be mounted within a tool secured enclosure which is capable of accepting one or more of the Zone 2 wiring methods specified in the Canadian Electrical Code (C22.1). Where installed in outdoor or potentially wet locations, the enclosure shall, at a minimum, meet the requirements of IP54.
3. In Zone 2 installations, the installer shall ensure protection of supply terminals against transient voltages exceeding 140% of the rated supply voltage.
4. Install in environments rated Pollution Degree 2 or better; overvoltage category I or II.
5. It is the responsibility of the manufacturer to provide warning markings in French where required by local jurisdictions.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

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Canadian Certificate Of Conformity No: FM19CA0031X

16. Certificate History

Details of the supplements to this certificate are described below:

Date	Description
28 th June 2019	<u>Supplement 2:</u> Report Reference: - PR452213 dated 28 th June 2019 Description of the Change: Update the standards to current editions. Add 9116A model variation. Update certificate to latest format.

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