

Sensing and Control

Installation Manual for Intrinsically-Safe Transmitters

Option Code 2n



Sensotec Sensors

Honeywell

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Intrinsically-Safe Transmitter

Option Code 2n

Document Number: 008-0547-00

Rev. C: September, 2004



WARNING

The operator of this instrument is advised that if the equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.

CAUTION

Only qualified, service-trained personnel who are aware of the hazards involved should connect external wiring to these products.



WARNING **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices, or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

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Chapter 1

Introduction

1

Introduction

This installation manual is shipped with each transducer with an option code 2n internal amplifier. It supplements the Calibration Certificate that ships with the transducer which contains other important information about wiring and use of the transducer in hazardous locations.

The most current information is available from our website:

<http://www.honeywell.com/sensotec>

Chapter 2

Intrinsically-Safe Installation

2.1 Introduction

2.1.1 Intrinsic Safety

A transducer ordered with option code 2n includes a 2-wire, 4-20mA amplifier that has been certified as “intrinsically safe” by the following recognized testing laboratories:

- Factory Mutual Research Corporation (FM), United States of America
- Canadian Standards Association (CSA), Canada
- Central Laboratory for the Electric Industry (LCIE), France. LCIE is a European-approved certification body. KEMA is the issuer of the EC-type Examination Certificate.

“Intrinsic safety” insures that a circuit operated under normal and specified fault conditions is not capable of causing ignition of the prescribed explosive atmosphere.

2.2 Installation

The certification of each testing laboratory is valid when the transducer has been installed according the installation drawings or certificates of conformity included in this chapter. The current versions of these installation drawings are available from our web site:

<http://www.honeywell.com/sensotec>

2.2.1 FM Installation Drawings For I.S. Applications

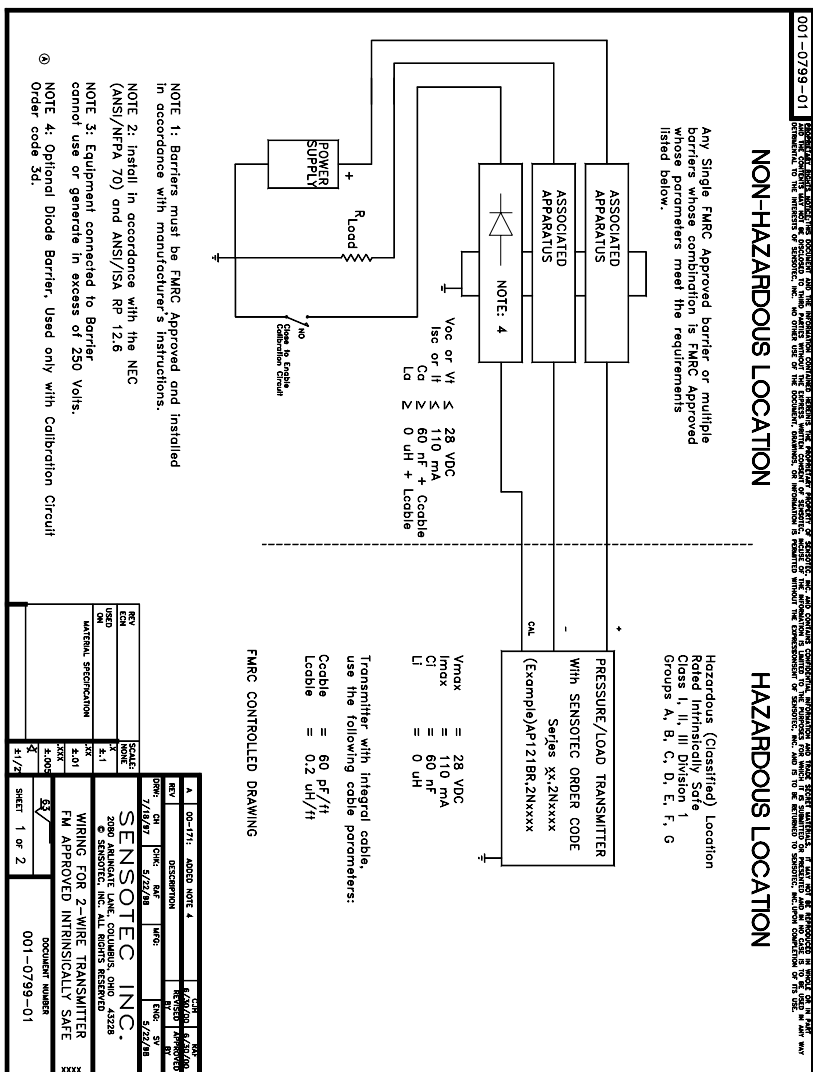


Figure 2-1: FM-Approved I.S Wiring, two single-channel barriers

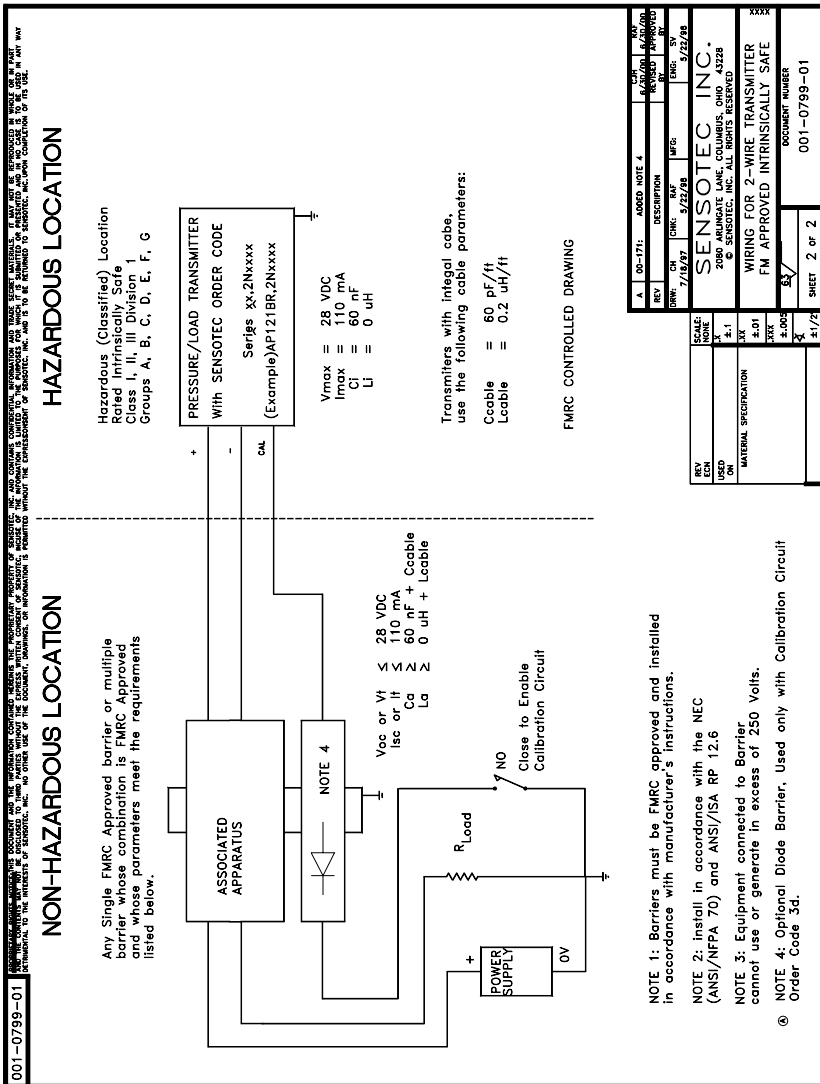
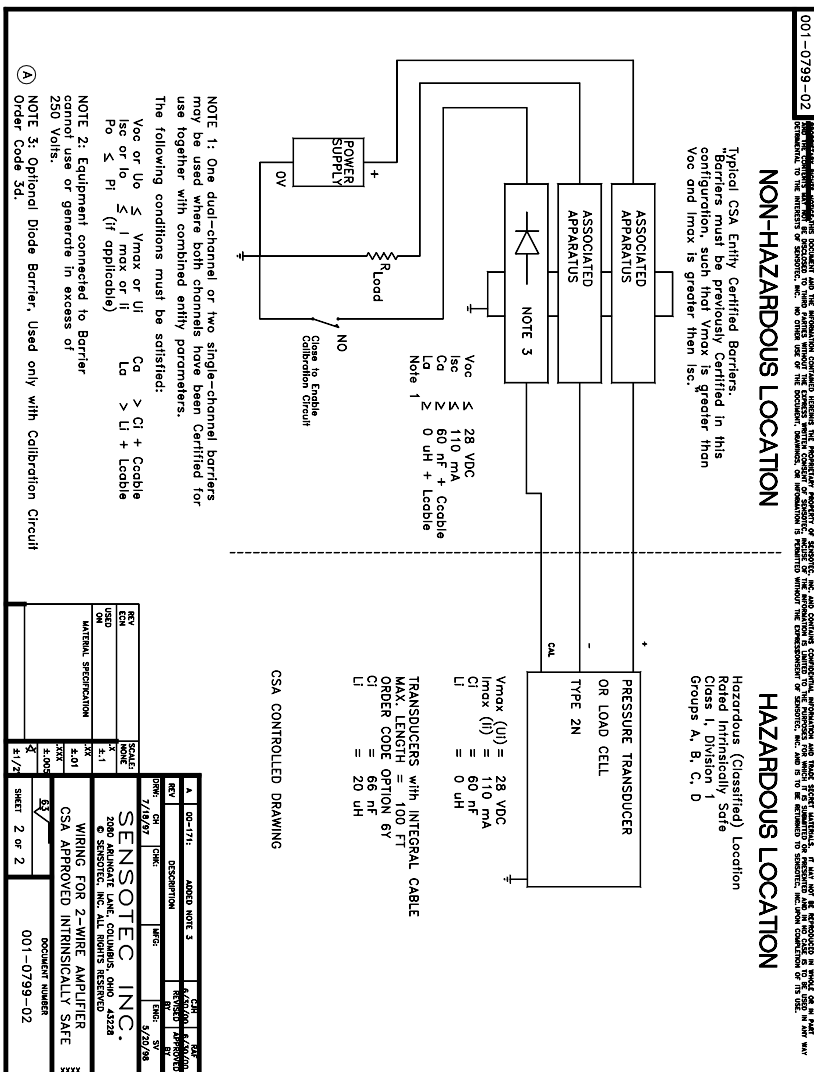


Figure 2-2: FM-Approved I.S. Wiring, one dual-channel barrier

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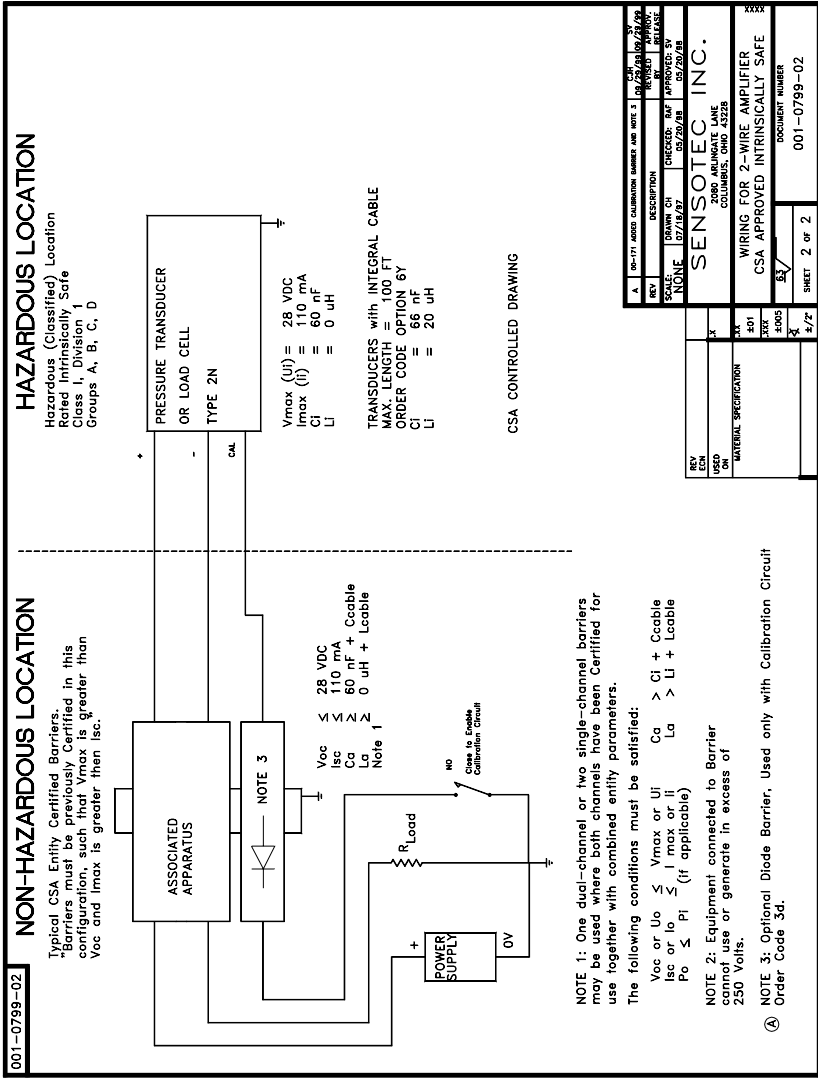
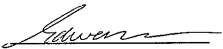


Figure 2-4: CSA Approved Wiring, one dual-channel barrier

2.2.3 CSA Certificate of Compliance for Intrinsically-Safe Systems

Copies of this certificate may be obtained by requesting document number 009-0028-01.

CSA INTERNATIONAL	
Certificate of Compliance	
Certificate Number: LR 104792-6	Date Issued: September 29, 1999
Revision: LR 104792-8	
Issued to: SENSOTEC INC. 2080 Arlington Lane Columbus, OH 43228 U.S.A. Attention: Mr. Steve Vicars	
<i>The products listed below are eligible to bear the CSA Mark shown, with adjacent indicator "C" and "US".</i>	
	Issued by: E. Foo, CET
Signature: 	
PRODUCTS	
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
Class I, Groups A, B, C and D:	
- Pressure Transmitters, Series xx2Nxxxx; input rated 9-28Vdc, 4-20mA; intrinsically safe when connected per Installation Drawing No. 001-0799-02 with Entity parameters of Vmax = 28V dc, Imax = 110mA, Li = 0 µH and Ci = 60 nF; Max. Ambient 85 Deg. C.	
- Pressure Transmitters, Series xx2Nxxxx6Y; input rated 9-28Vdc, 4-20mA; intrinsically safe when connected per Installation Drawing No. 001-0799-02 with Entity parameters of Vmax = 28V dc, Imax = 110mA, Li = 20 µH and Ci = 66 nF; Max. Ambient 85 Deg. C.	
- Load Cells, Series xx2Nxxxx; input rated 9-28Vdc, 4-20mA; intrinsically safe when connected per Installation Drawing No. 001-0799-02 with Entity parameters of Vmax = 28V dc, Imax = 110mA, Li = 0 µH and Ci = 60 nF; Max. Ambient 85 Deg. C.	
The "C" and "US" indicator adjacent to the CSA Mark signifies that the product has been evaluated to the applicable ANSI/UL and CSA Standards, for use in the U.S. and Canada. This includes products eligible to bear the NRTL indicator. NRTL, i.e. Nationally Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.	
DQD 507W7 99/05/01	
Page 1	



Certificate No.: LR 104792-6

CSA INTERNATIONAL

Date: September 29, 1999

Revision: LR 104792-8

- Load Cells, Series xx2Nxxxx6Y; input rated 9-28Vdc, 4-20mA; intrinsically safe when connected per Installation Drawing No. 001-0799-02 with Entity parameters of $V_{max} = 28V$ dc, $I_{max} = 110mA$, $L_i = 20 \mu H$ and $C_i = 66 nF$; Max. Ambient 85 Deg. C.

APPLICABLE REQUIREMENTS

- | | | |
|----------------------------|---|---|
| CSA Std C22.2 No.142-M1987 | - | Process Control Equipment |
| CAN/CSA-C22.2 No. 157-92 | - | Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations |
| UL Std No. 913 | - | Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1, Hazardous Locations |
| UL Std No. 916 | - | Energy Management Equipment |

MARKINGS

- CSA Monogram, with NRTL/C or C/US indicator;
- Submitter Identification;
- Model Number;
- Serial Number;
- Hazardous Location Designation;
- Maximum Ambient rating
- Enclosure Designation;
- The words "Intrinsically Safe"; and
- Reference to Installation Instructions.



CSA INTERNATIONAL

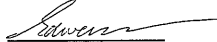
Supplement to Certificate of Compliance

Certificate No.: LR 104792-6

Issued to: **SENSOTEC INC.**
2080 Arlingate Lane
Columbus, OH 43228
U.S.A.
Attention: Mr. Steve Vicars

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Issued By: E. Foo, CET

Signature: 

Product Certification History

Revision	Date	Description
-8	Sept. 29/99	Revision to include EMI filter cct. and addition of alternative model order codes.
-6	Aug. 4, 1999	Original Certification.

2.2.4 EC type Examination Certificate

Copies of this certificate are available as document number 009-0027-01.



L C I E

1 ATTESTATION D'EXAMEN CE DE TYPE

- 2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE
- 3 Numéro de l'attestation CE de type
LCIE 03 ATEX 6268 X
- 4 Capteurs de pression et de charge
Type : xx2Nxxxx, xx2Nxxxx6y
- 5 Demandeur : HONEYWELL Inc
- 6 Adresse : 2080 Arlington Lane
Columbus, Ohio, 43228 USA
- 7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.
- 8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N°60011788-505347.
- 9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
-EN 50014 (1997) + amendements 1 et 2
-EN 50020 (2002), EN 50284 (1999).
- 10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.
- 11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE. Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.
- 12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :
 EEx ia IIC T5

1 EC TYPE EXAMINATION CERTIFICATE

- 2 Equipment or protective system intended for use in potentially explosive atmospheres
Directive 94/9/EC
- 3 EC type Examination Certificate number
LCIE 03 ATEX 6268 X
- 4 Pressure and Load Transducers
Type : xx2Nxxxx, xx2Nxxxx6y
- 5 Applicant : HONEYWELL Inc
- 6 Address : 2080 Arlington Lane
Columbus, Ohio, 43228 USA
- 7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- 8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/EC of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II of the Directive. The examination and test results are recorded in confidential report N°60011788-505347.
- 9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :
-EN 50014 (1997) + amendments 1 and 2
-EN 50020 (2002), EN 50284 (1999).
- 10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.
- 11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive apply to the manufacture and supply of this equipment or protective system.
- 12 The marking of the equipment or protective system shall include the following :
 EEx ia IIC T5

Fontenay-aux-Roses, le 26 Août 2003

Le Directeur de l'organisme certificateur
Manager of the certification body

Imprimé sig / Dry sig

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Société anonyme à directrice
et conseil de surveillance
au capital de 15 745 984 €
RCS Nanterre B 408 363 174

L00



(A1) ANNEXE

(A1) SCHEDULE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 03 ATEX 6268 X

LCIE 03 ATEX 6268 X

(A3) Description de l'équipement ou du système de protection :

Transmetteur de pression et de charge
Type : xx2Nxxxx et xx2Nxxxx6Y

Les transmetteurs de pression comprennent un capteur, un amplificateur et une carte entrée/sortie et délivrent un signal 0-5 V ou 4-20 mA. Les types xx2Nxxxx ont un connecteur externe alors que les types xx2Nxxxx6y ont un câble permanent (jusqu'à 30.5 mètres).

Paramètres spécifiques du ou des modes de protection concerné(s)

Type	Type xx2Nxxxx	Type xx2Nxxxx6Y
UI (V)	28	28
Ii (mA)	110	110
Pi (W)	1	1
Li (µH)	0	30.5
CI (nF)	60	66

Le marquage est le suivant :

HONEYWELL Inc
Adresse

Type : xx2Nxxxx, xx2Nxxxx6y

N° de fabrication : ... Année de construction : ...

LCIE 03 ATEX 6268 X

Ex II 1 G EEx ia IIC T5

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné

(A4) Documents descriptifs :

Dossier technique N°089-0005-00 Rév A daté du 18 août 2003.
Ce document comprend 6 rubriques (7 pages).

(A5) Conditions spéciales pour une utilisation sûre :

Température ambiante d'utilisation : - 40°C à +93°C

Lors de l'installation, le boîtier de l'appareil doit être soit isolé de surfaces mises à la terre soit être au même potentiel que la terre du matériel associé.

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2), EN 50020 (2002), EN 50284 (1999).

Vérifications et épreuves individuelles

Néant

(A3) Description of Equipment or Protective System:

Pressure and load transmitter
Type : xx2Nxxxx and xx2Nxxxx6Y

The pressure transmitters include a sensor, an amplifier, and an in/out board and deliver 0-5V DC or 4-20 mA signal. The models xx2Nxxxx are provided with an external connector, while the models xx2Nxxxx6y are provided with a permanent cable (up to 30.5 meters).

Specific parameters of the mode of protection concerned:

The marking is the following :

HONEYWELL Inc
Address

Type : xx2Nxxxx, xx2Nxxxx6y

Serial number : ... Year of construction : ...

LCIE 03 ATEX 6268 X

Ex II 1 G EEx ia IIC T5

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

(A4) Descriptive documents:

Technical file No 089-0005-00 Rev A dated August 18th, 2003.
This file includes 6 items (7 pages).

(A5) Special conditions for safe use:

Ambient operating temperature: - 40°C to +93°C

On installation the case of the device shall either be isolated from grounded surfaces, or be at the same potential as associated apparatus ground.

(A6) Essential Health and Safety Requirements:

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2), EN 50020 (2002), EN 50284 (1999) .

Individual examinations and tests

None

2.2.5 ATEX Declaration of Conformity



We declare under our sole responsibility that the following products,

Pressure and Load Transmitter

Types: xx2Nxxxx and xx2Nxxxx6Y

to which this declaration relates, are in conformity with the protection requirements of Council directive: 94/9/EC (ATEX Directive) concerning equipment and protective systems intended for use in potentially explosive atmospheres.

Conformity to the ATEX Directive is in accordance with the following European standards. Conformity with this product with any other "CE Mark" Directive(s) shall not be assumed.

- | | |
|----------------------|---|
| EN 50014-1997 | Electrical Apparatus for Potentially Explosive Atmospheres - General Requirements |
| EN 50020-2002 | Electrical Apparatus for Potentially Explosive Atmospheres - Intrinsic Safety "i" |
| EN 50284-1999 | Special Requirements for Construction, Test and Marking of Electrical Apparatus of Equipment Group II, Category 1 G |

EC type Examination Certificate number: LCIE 03 ATEX 6268 X. The letter X behind the certificate number indicates that this equipment is subject to special conditions for safe use listed in the section A5 of the Certificate.

Notified Body Identification: KEMA, identification number: 0344

Manufacturer:

Honeywell Sensotec
2080 Arlingate Lane
Columbus, OH 43228-4112 USA

Production Site:

Honeywell Sensotec
2080 Arlingate Lane
Columbus, OH 43228-4112 USA

A handwritten signature in black ink, appearing to read 'Brian Duffy'.

Brian Duffy, Engineering Manager

(ATEX Authorized Person)

Issue Date: December 21, 2004

Chapter 3

Non-Incendive Installation

3.1 Introduction

3.1.1 Non-Incendive

A transducer ordered with option code 2n includes a 2-wire, 4-20mA amplifier that has been certified as “non-incendive” by the following recognized testing laboratories:

- Factory Mutual Research Corporation (FM), United States of America
- Canadian Standards Association (CSA), Canada

“Non-incendive” circuits are designed and constructed so that they are not capable under normal operating conditions or due to opening, shorting, or grounding of field wiring, of causing an ignition of the prescribed flammable gas or vapor.

3.2 Installation

The certification of each testing laboratory is valid when the transducer has been installed according the installation drawings included in this chapter. The current versions of these installation drawings are available from our web site:

<http://www.honeywell.com/sensotec>

3.2.1 FM Installation Drawings for Non-Incendive Applications

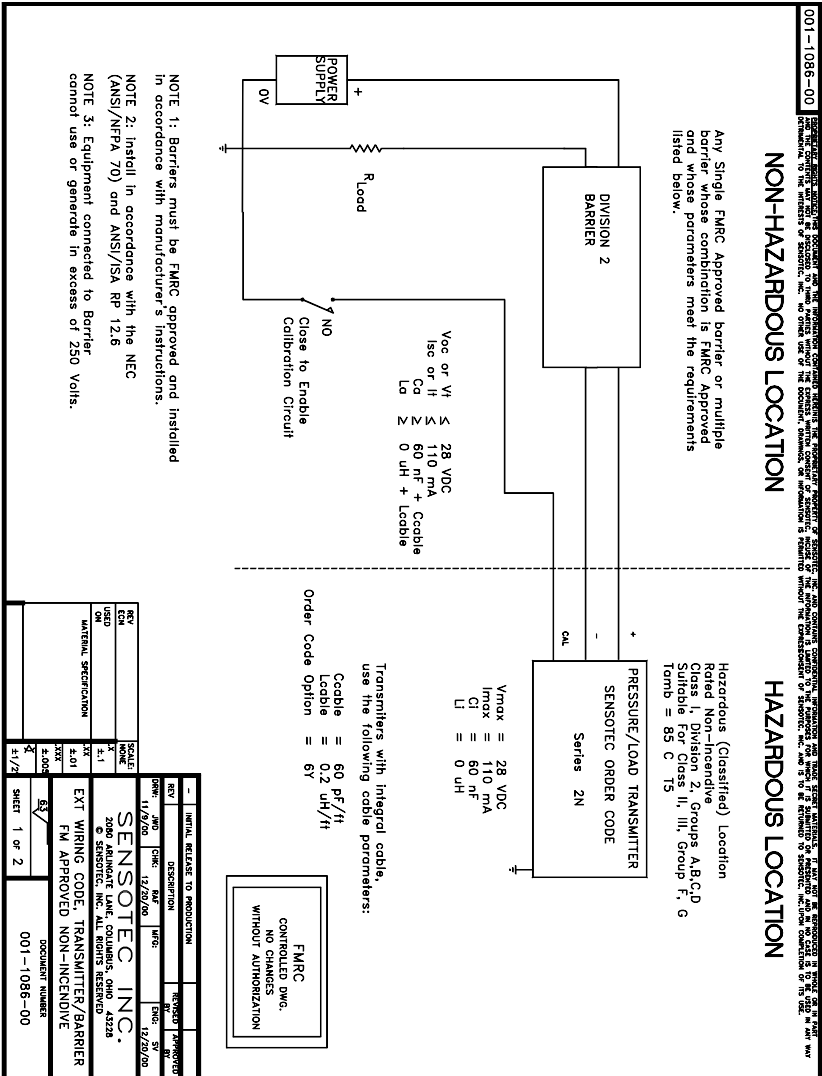


Figure 3-1: FM Approved Wiring, two single-channel barriers

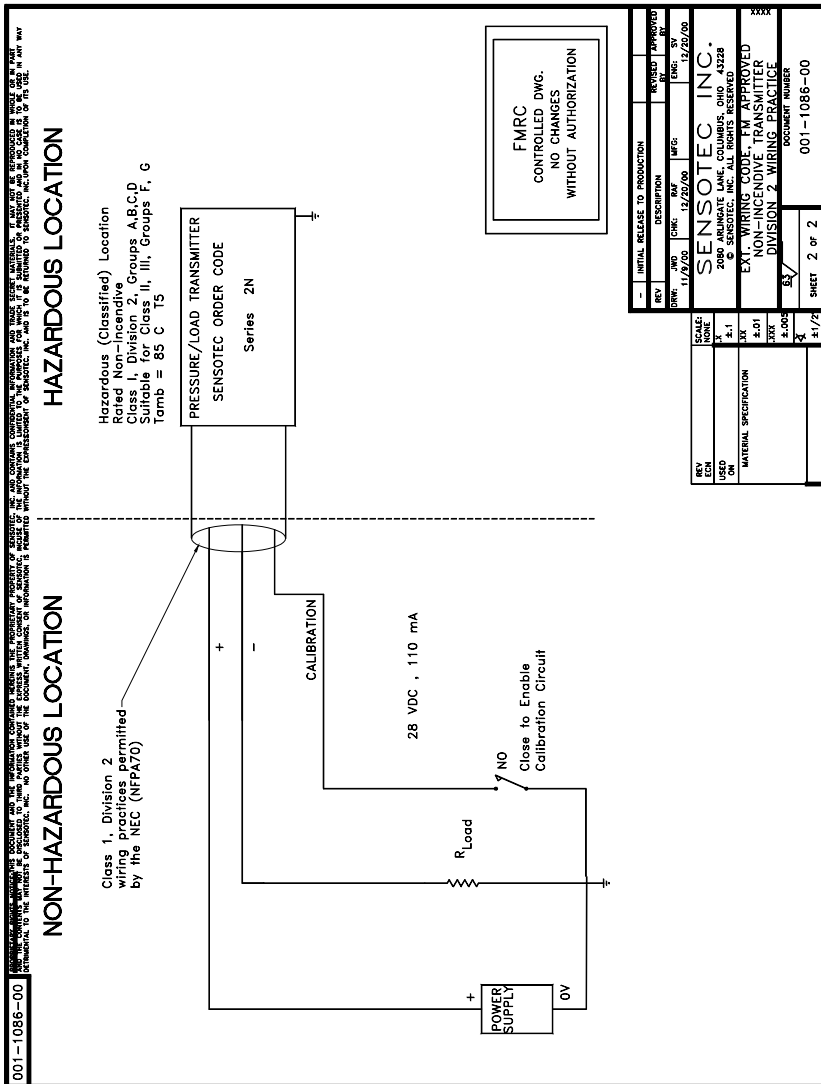


Figure 3-2: FM Approved Wiring, one dual-channel barrier

3.2.2 CSA Installation Drawings for Non-Incendive Applications

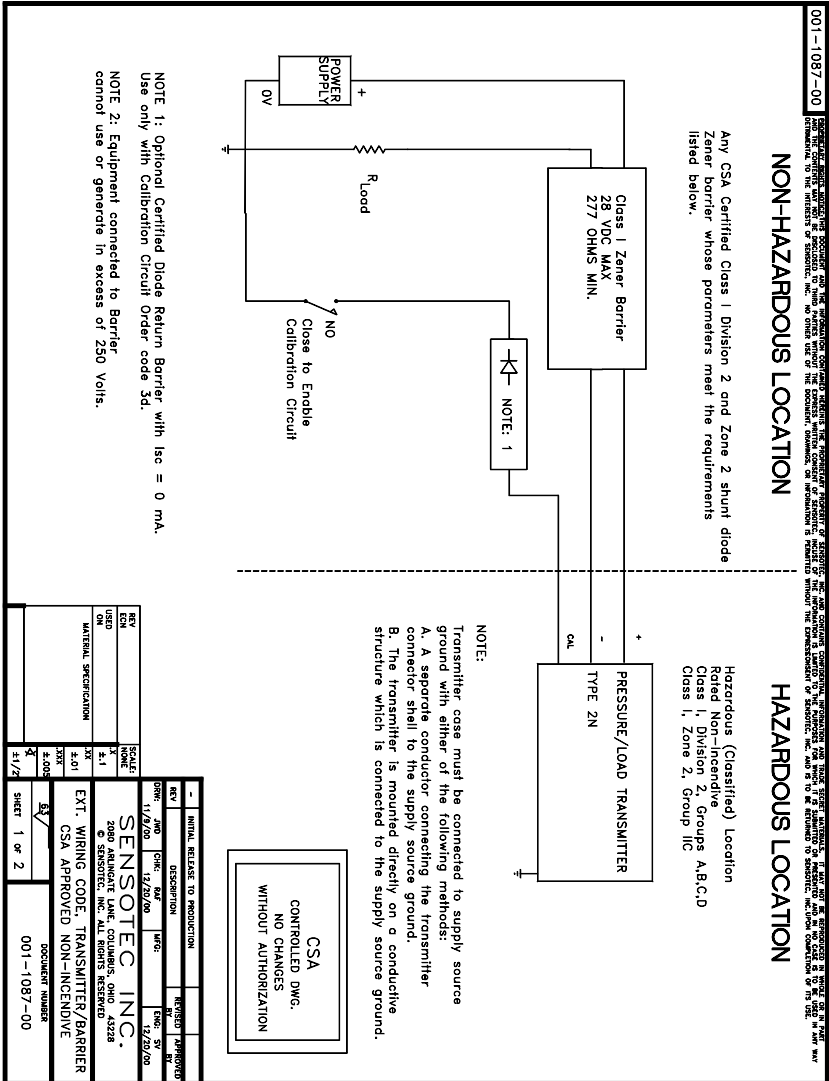


Figure 3-3: CSA Approved Wiring, two single-channel barriers

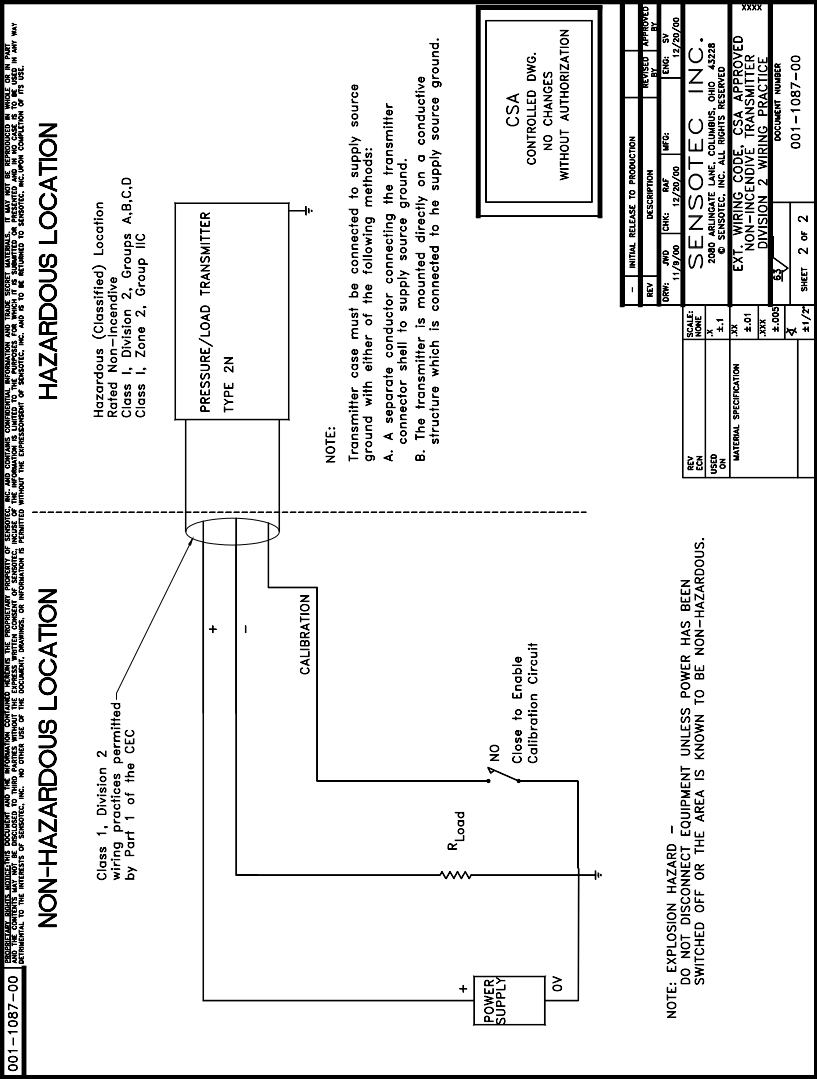
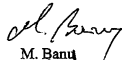
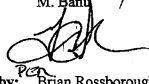


Figure 3-4: CSA Approved Wiring, one dual-channel barrier

3.2.3 CSA Certificate of Compliance for Non-Incendive Systems

Copies of this certificate may be obtained by requesting document number 009-0028-02.

 CSA INTERNATIONAL	
Certificate of Compliance	
Certificate: 1156893	Master Contract: 162245 (LR 104792)
Project: 1156893	Date Issued: January 10, 2001
Issued to: SENSOTEC INC. 2080 Arlingate Lane Columbus, OH 43228 USA Attention: Mr. Steve Vicars	
<i>The products listed below are eligible to bear the CSA Mark shown</i>	
	Issued by:  M. Banu
	Authorized by:  Brian Rossborough, P. Eng Operations Manager
PRODUCTS	
CLASS 2258 03 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non Incendive Systems - For Hazardous Locations	
Class I, Div. 2 Groups A, B, C and D, T5:	
- Pressure Transmitters, Series xx2Nxxxx; input rated 9-28Vdc, 4-20mA. Max. Ambient 85 Deg.C. Non-incendive when connected to CSA Certified Class I safety barrier rated 28 Vdc max, 277 ohms min. and install per Dwg. 001-1087-00 (sheet 1) - Pressure Transmitters, Series xx2Nxxxx6Y; rated 9-28Vdc, 4-20mA. Max. Ambient 85 Deg. C. Non-incendive when connected to CSA Certified Class I safety barrier rated 28 Vdc max, 277 ohms min. and installed per Dwg. 001-1087-00 (sheet 1). - Load Cells, Series xx2Nxxxx; rated 9-28Vdc, 4-20mA; Max. Ambient 85 Deg. C. Non-incendive when connected to CSA Certified Class I safety barrier rated 28 Vdc max, 277 ohms min., and installed per Dwg. 001-1087-00 (sheet 1). - Load Cells, Series xx2Nxxxx6Y; rated 9-28Vdc, 4-20mA; Max. Ambient 85 Deg. C. Non-incendive when connected to CSA Certified Class I zener barrier 28 Vdc max, 277 ohms min., and installed per Dwg. 001-1087-00 (sheet 1).	
DQD 507WP 2000/11/30	Page 1

Certificate: 1156893



Master Contract: 162245 (LR 104792)

Project: 1156893

Date: December 22, 2000

CLASS 2258 02 - PROCESS CONTROL EQUIPMENT- For Hazardous Locations

Class I, Div. 2 Groups A, B, C and D, T5:

- Pressure Transmitters, Series xx2Nxccc; input rated 9-28Vdc, 4-20mA; Max. Ambient 85 Deg. C. Suitable for Class I, Div. 2 Groups A, B, C and D when installed per Dwg. 001-1087-00 (sheet 2)
- Pressure Transmitters, Series xx2NxcccY; rated 9-28Vdc, 4-20mA; Max. Ambient 85 Deg. C. Suitable for Class I, Div. 2 Groups A, B, C and D when installed per Dwg. 001-1087-00 (sheet 2)
- Load Cells, Series xx2Nxccc; rated 9-28Vdc, 4-20mA; Max. Ambient 85 Deg. C. Suitable for Class I, Div. 2 Groups A, B, C and D when installed per Dwg. 001-1087-00 (sheet 2)
- Load Cells, Series xx2NxcccY; rated 9-28Vdc, 4-20mA; Max. Ambient 85 Deg. C. Suitable for Class I, Div. 2 Groups A, B, C and D when installed per Dwg. 001-1087-00 (sheet 2).

Note: Device model Series 2N is provided with prefixes and suffixes denoting Product Order Code, Range, Series, and other variations

APPLICABLE REQUIREMENTS

CSA Std C22.2 No.	142-M1987	- Process Control Equipment
CSA Std C22.2 No.	213-M1987	- Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations

MARKINGS

- CSA Monogram
- Submitter Identification;
- Model Number;
- Serial Number;
- Electrical ratings;
- Temperature Code;
- Hazardous Location Designation;
- Maximum Ambient Temperature;
- A reference to Installation Instructions, (eg. MUST BE INSTALLED PER INSTRUCTIONS DRAWING 001-1087-00 sheet 1 and 2);
- Caution: Use supply wires suitable for 5°C above surrounding ambient;
- Warning: Explosion Hazard-Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous;
- Warning: Explosion Hazard-Substitution of components may impair suitability for class I, Division 2.



Supplement to Certificate of Compliance

Certificate: 1156893

Master Contract: 162245 (LR 104792)

Project: 1156893

*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
1156893	Jan. 10, 2001	Original Certification.

Warranty

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is the Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

While we provide applications assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.



Honeywell Automation and Control Solutions

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