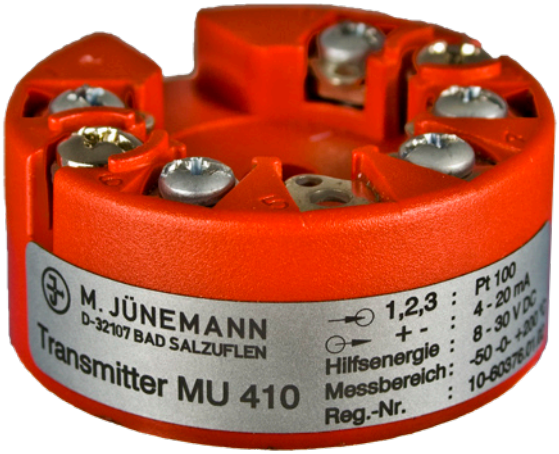
Betriebsanleitung



CE

Programmierbare 2- Leiter Messumformer

Typ:

MU410 / 5331

MU410 Ex / 5331 Ex

MANFREDJÜNEMANN
Mess- und Regeltechnik GmbH
Max-Planck-Str. 49
D-32107 Bad Salzuflen
Tel: +49 (0)5222 / 80768-0
Fax: +49 (0)5222 / 80768-20
www.juenemann-instruments.de
eMail: verkauf@juenemann-instruments.de

Quality for the future

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2-DRAHT UNIVERSALMESSUMFORMER MU410/MU410Ex, PRetop 5331

Verwendung

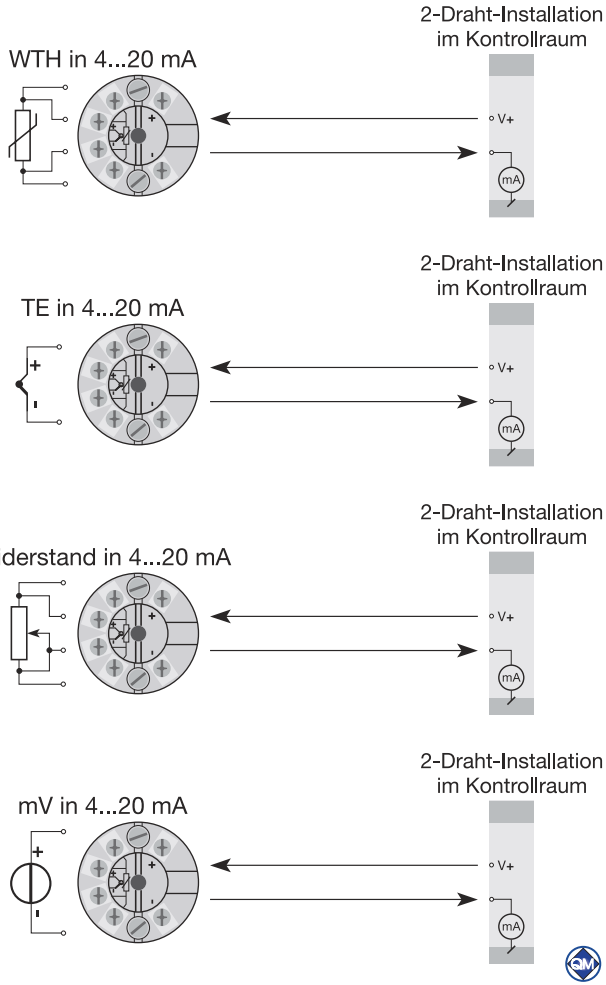
- Linearisierte Temperaturmessung mit Pt100 ... Pt1000, Ni100 ... Ni1000 Thermoelementsensor.
- Umwandlung von linearer Widerstandsänderung in ein analoges Standard-Stromsignal, z.B. von Ventilen oder Niveau-Messwertgeber.

Technische Merkmale

- Der MU 410 / 5331 kann vom Benutzer innerhalb kurzer Zeit zur Messung in alle genormten Temperaturbereiche programmiert werden.
- Der Widerstandsthermometereingang hat eine Leitungskompensation bei 2, 3, und 4-Leiter Anschluss.
- Die gespeicherten Daten werden laufend kontrolliert.

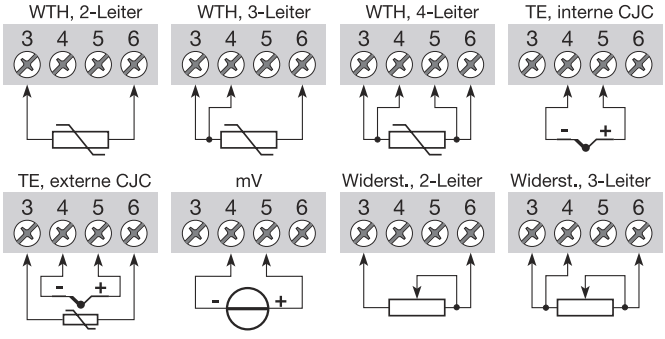
Montage / Installation

- Für den Einbau in einen Anschlusskopf DIN 43729, Form B oder die Montage auf eine DIN-Schiene mittels einer speziellen Klemmvorrichtung.
- Als Ex-Sicherheitsbarriere für den MU 410 Ex / 5331 Ex empfehlen wir den Speisetrenner Typ 5104B, 5111B, oder 5114B.

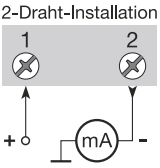


Anschlüsse:

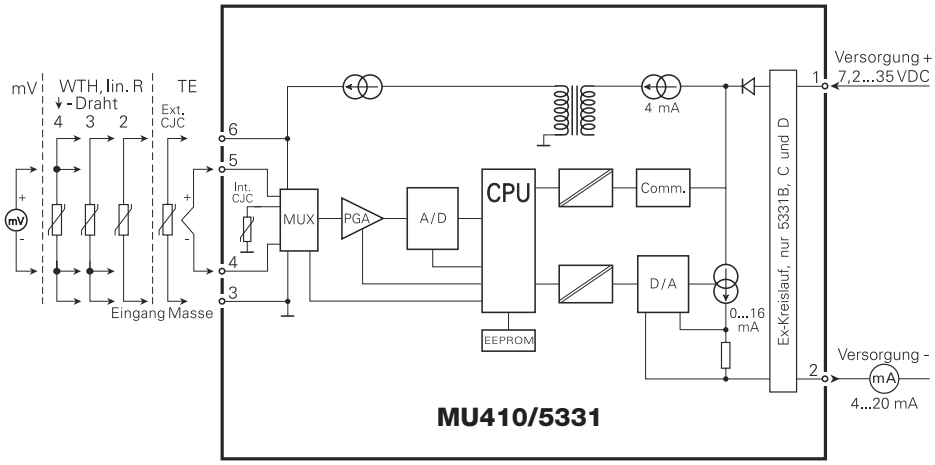
Eingang:



Ausgang:



Blockdiagramm



Versorgungsspannung.....: 7,2 ... 35 V DC (Standard 5331A)
ATEX, FM und CSA, 5331B, C und D.....: 7,2 ... 28 V DC
Eigenverbrauch.....: 25 mW ... 0,8 W
Spannungsabfall.....: 7,2 V DC
Isolationsspannung, Test/Betrieb.....: 1,5 kVAC / 50 VAC
Aufwärmzeit.....: 5 Min.
Kommunikationsschnittstelle.....: Loop Link 5905A
Signal- / Rauschverhältnis.....: min. 60 dB
Ansprechzeit (programmierbar).....: 1 ... 60 s
EEprom Fehlerkontrolle.....: < 3,5 s
Signalauflösung, Eingang.....: 20 bit
Signalauflösung, Ausgang.....: 16 bit
Kalibriertemperatur.....: 20 ... 28°C
Betriebstemperatur.....: -40 ... +85°C
Absolute Genauigkeit.....: ≤ ± 0,1 % d. Messspanne
Temperaturkoeffizient.....: ≤ ± 0,01 % d. Messspanne / °C
Versorgungsspannung-Änderungseinfluss.....: ≤ ± 0,005 % d. Messspanne/V DC
EMV-Immunitätseinwirkung.....: ≤ ± 0,5 % d. Messspanne
Vibration.....: IEC 60068-2-6 Test FC
Lloyd's Spezifikation Nr. 1.....: 4 g / 2 ... 100 Hz
Max. Leitungsquerschnitt.....: 1 x 1,5 mm² Mehraderkabel
Luftfeuchtigkeit.....: < 95 % RH (nicht kond.)
Maß.....: ∅ 44 x 20,2 mm
Schutzart (Gehäuse / Anschluss).....: IP68 / IP00
Gewicht.....: 50 g

Genauigkeit, höherer Wert von allgemeinen und Grundwerten:

Allgemeine Werte		
Eingangsart	Absolute Genauigkeit	Temperaturkoeffizient
Alle	≤±0,05% d. Messsp.	≤±0,01% d. Messsp./°C

Grundwerte		
Eingangsart	Grundgenauigkeit	Temperaturkoeffizient
WTH	≤±0,2% °C	≤±0,01% °C/°C
Lin.R	≤±0,1% Ω	≤±10 mΩ/°C
Volt	≤±10% µV	≤±1 µV/°C
TE-Typ: E, J, K, L, N, T, U	≤±1°C	≤±0,05% °C/°C
TE-Typ: B, R, S, W3, W5	≤±2°C	≤±0,02% °C/°C

EMV-Immunitätswirkung.....: < ±0,5% d. Messsp.
Erweiterte EMV-Immunität:
NAMUR NE 21, A Kriterium, Burst.....: < ±1% d. Messsp

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Elektrische Daten, Eingang:

WTH- und Linearer Widerstandseingang:

WTH-Typ	Min. Wert	Max. Wert	Min. Spanne
Pt100	-200°C	+850°C	25°C
Ni100	-60°C	+250°C	25°C
Lin.R	0Ω	5000Ω	30°C

Max. Nullpunktverschiebung (Offset).....: 50% des gewählten Max.-Wertes
Leitungswiderstand pro Leiter (Max.).....: 5 Ω
Sensorstrom.....: Nom. 0,2 mA
Wirkung des Fühlerkabelwiderstandes (3-Leiter).....: < 0,002 Ω / Ω
Fühlerfehlererkennung.....: ja

TE-Eingang:

TE-Typ	Min. Temperatur °C	Max. Temperatur °C	Min. Spanne °C	Norm
B	+400	+1820	200	IEC584
E	-100	+1000	50	IEC584
J	-100	+1200	50	IEC584
K	-180	+1327	50	IEC584
L	-100	+900	50	DIN 43710
N	-180	+1300	100	IEC584
R	-50	+1760	200	IEC584
S	-50	+1760	200	IEC584
T	-200	+400	50	IEC584
U	-200	+600	75	DIN 43710
W3	0	+2300	200	ASTM E988-90
W5	0	+2300	200	ASTM E988-90

Max. Nullpunktverschiebung (Offset).....: 50% des gewählten Max.-Wertes
Vergleichstellenkompensation (CJC).....: <± 1,0°C
Fühlerfehlererkennung.....: ja
Fühlerfehlerstrom:
Bei Erkennung.....: Nom. 33 mA
Sonst.....: 0 mA

Spannungseingang:

Messbereich.....: 4 ... 20 mA
Min. Messbereich (Spanne).....: 16 mA
Max. Nullpunktverschiebung (Offset).....: 135 ms
Eingangswiderstand.....: 10 mΩ

Ausgang:

Signalmessbereich.....: 4 ... 20 mA
Min. Signalbereich.....: 16 mA
Aktualisierungszeit.....: 440 ms
Belastungswiderstand.....: ≤ ($U_{Vers.}$ - 7,2) / 0,023 [Ω]
Belastungsstabilität.....: < ± 0,01% d. Messsp. / 100 Ω

Fühlerfehlererkennung

Programmierbar.....: 3,5 ... 23 mA
NAMUR NE43 aufsteuernd.....: 23 mA
NAMUR NE43 zusteuernd.....: 3,5 mA

Ex-Daten

Signalausgang / Versorgung, Klemme 1 und 2:

U_i.....: 30 V DC
I_i.....: 120 mADC
P_i.....: 0,84 W
L_i.....: 10 µH
C_i.....: 1,0 nF

Fühlereingang, Klemme 3, 4 und 6:

U_o.....: 27 V
I_o.....: 7 mA
P_o.....: 45 mW
L_o.....: 35 mH
C_o.....: 90 nF

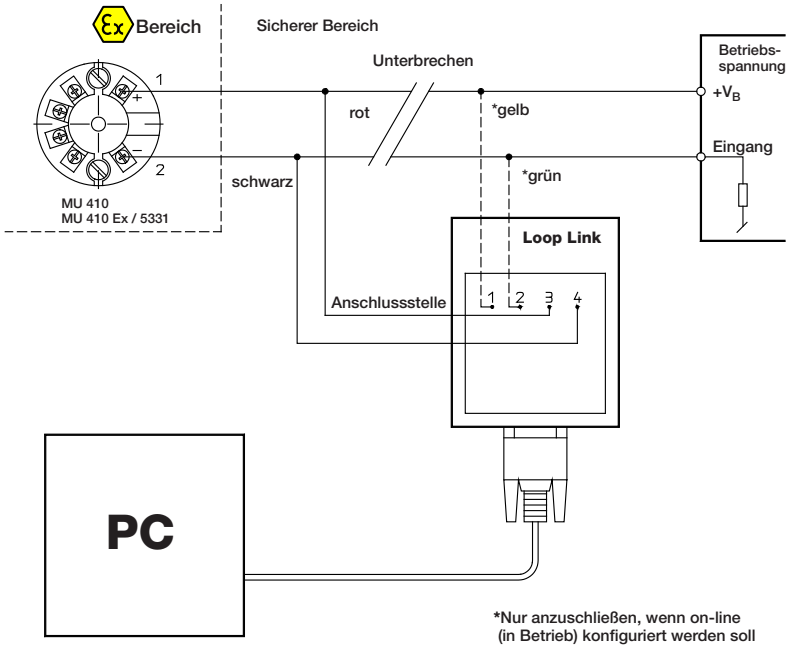
EEx-Zulassung CENELEC:

DEMKO 99..... ATEX 126962
ATEX..... 0539 Ex II 1 G
EEx ia IIC T1 ... T6
Max. Umgebungstemperatur für T1 ... T4..... 85°C
Max. Umgebungstemperatur für T5 und T6..... 60°C
ATEX für Anwendung in Zone..... 0, 1 oder 2
FM, für Anwendung in..... IS, CL, I, DIV. 1, GP. A-D
Entity, FM Installation Drawing No..... 53300Q502
CSA, für Anwendung in..... Class I, Zone 0/1, Group IIC
Installation Drawing No..... 533XQC03

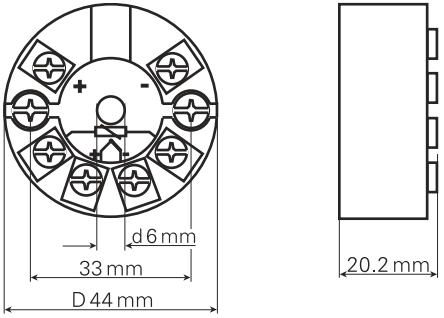
Eingehaltene Behördenvorschriften	**Norm**
EMC 89/336/EWG, Emission	EN 50 081-1, EN 50 081-2
Immunität	EN 50 082-1, EN 50 082-2
Emission und Immunität	EN 61 326
ATEX 94/9/EG	EN 50 014 und EN 50 020
FM ASCN	3600, 3810, 3611, 3610
CSA, CAN / CSA	E79-15, E7911

Programmierung:

- Loop Link 5905A ist eine batteriegespeiste Schnittstelle zur Programmierung des MU 410 und MU 410 Ex / 5331
- Loop Link darf nicht zur Kommunikation mit Modulen, die in Ex-gefährdeten Bereichen installiert sind, benutzt werden.



Abmessungen



APPENDIX

ATEX Installation Drawing - 5331 A

ATEX Installation Drawing - 5331 D

FM Control Drawing No. 5300Q502

CSA Installation Drawing No. 533XQC03

ATEX Installation drawing

For safe installation of 5331A3B or 5334A3B the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.
Year of manufacture can be taken from the first two digits in the serial number.

.

ATEX Certificate KEMA 10ATEX 0002X

Marking

II 3 GD Ex nA [nL] IIC T6…T4
II 3 GD Ex nL IIC T6...T4

II 3 GD Ex nA [ic] IIC T6...T4
II 3 GD Ex ic IIC T6...T4

Standards EN 60079-0 : 2006, EN 60079-11 : 2007, EN 60079-15 : 2005

	Terminal: 3,4,5,6	**Terminal: 1,2**	**Terminal: 1,2**
T4: -40 ≤ Ta ≤ 85ºC T6: -40 ≤ Ta ≤ 60ºC	Ex nA [nL]	Ex nA	Ex nL or Ex ic
	Uo: 9.6 V Io: 25 mA Po: 60 mW Lo: 33 mH Co: 2.4 µF	U ≤ 35 VDC I = 4 - 20 mA	Ui = 35 VDC Li = 10 µH Ci = 1.0 nF

Special conditions for safe use

For use in a potentially explosive atmosphere of flammable gasses, vapours or mists, the transmitter shall be mounted in an enclosure providing a degree of protection of at least IP54 in accordance to EN60529.

For use in the presence of combustible dusts the transmitter shall be mounted in an enclosure providing a degree of protection of at least IP6X in accordance with o EN60529. The surface temperature of the enclosure shall be determined after installation of the transmitter.

For an ambient temperature ≥ 60ºC, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

ATEX Installation drawing

5331

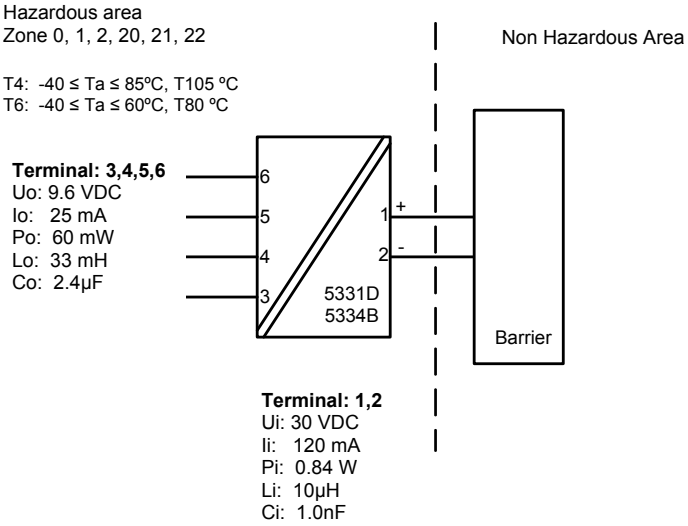
For safe installation of 5331D or 5334B the following must be observed. The module shall only be Installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.
Year of manufacture can be taken from the first two digits in the serial number.

.

ATEX Certificate KEMA 06ATEX 0062

Marking II 1 G Ex ia IIC T6..T4
II 1 D Ex iaD

Standards EN 60079-0 : 2006, EN 60079-11 : 2007, EN 60079-26 : 2007, EN 61241-0 : 2006, EN 61241-11 : 2006



Installation notes.

The sensor circuit is not infallibly galvanic isolated from the input circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500Vac during 1 minute.

In a potentially explosive gas atmosphere, the transmitter shall be mounted in an enclosure in order to provide a degree of protection of at least IP20 according to EN60529.

If the transmitter is installed in an explosive atmosphere requiring the use of equipment of category 1G and if the enclosure is made of aluminium, it must be installed such, that even in the event of rare incidents, ignition sources due to impact and friction, sparks are excluded; if the enclosure is made of non-metallic materials, electrostatic charging shall be avoided.

For installation in a potentially explosive dust atmosphere, the following instructions apply:

The transmitter shall be mounted in a metal enclosure form B according to DIN43729 that is providing a degree of protection of at least IP6X according to EN60529, that is suitable for the application and correctly installed.

Cable entries and blanking elements shall be used that are suitable for the application and correctly installed.

For an ambient temperature ≥ 60ºC, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

The surface temperature of the enclosure is equal to the ambient temperature plus 20 K, for a dust layer with a thickness up to 5 mm

Installation Drawing 5300Q502.

Model 5331C,5331D, 5333C and 5333D

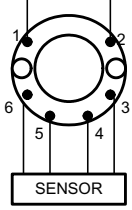
Hazardous (Classified) Location

Class I,Division1, Groups, A,B,C,D
Class II Division 1 Groups E,F,G or
Class I, Zone 0, IIC

Ambient temperature limits
T4: -40 to + 85 deg. Celcius
T6: -40 to + 60 deg. Celcius

Terminal 1 , 2
Vmax or Ui: 30 V
Imax or Ii: 120 mA
Pmax or Pi: 0.84 W
Ci: 1 nF
Li:10 uH

Terminal 3,4,5,6
Only passive, or non-energy storing devices such as RTD's and Thermocouples may be connected.



Non Hazardous Location

Associated Apparatus
or Barrier
with
entity Parameters:

UM ≤ 250V
Voc or Uo ≤ Vmax or Ui
Isc or Io ≤ Imax or Ii
Po ≤ Pi
Ca or Co ≥ Ci + Ccable
La or Lo ≥ Li + Lcable

This device must not be connected to any associated apparatus which uses or generates more than 250 VRMS

Model 5335C, 5335D.

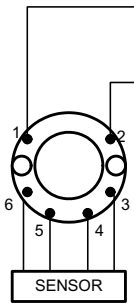
Hazardous (Classified) Location

Class I,Division1, Groups, A,B,C,D
Class II Division 1 Groups E,F,G or
Class I, Zone 0, IIC

Ambient temperature limits
T4: -40 to + 85 deg. Celcius
T6: -40 to + 60 deg. Celcius

Terminal 1 , 2
Vmax or Ui: 30 V
Imax or Ii: 120 mA
Pmax or Pi: 0.84 W
Ci: 1 nF
Li:10 uH

Terminal 3,4,5,6
Vt or Uo: 9.6 V
It or Io: 28 mA
Pt or Po: 67.2 mW
Ca or Co: 3.5 uF
La or Lo: 35 mH



Non Hazardous Location

Associated Apparatus
or Barrier
with
entity Parameters:

UM ≤ 250V
Voc or Uo ≤ Vmax or Ui
Isc or Io ≤ Imax or Ii
Po ≤ Pi
Ca or Co ≥ Ci + Ccable
La or Lo ≥ Li + Lcable

This device must not be connected to any associated apparatus which uses or generates more than 250 VRMS

The entity concept.

The Transmitter must be installed according to National Electrical Code (ANSI-NFPA 70).

When installed in Class II locations the Transmitter shall be installed in an enclosure with a specified ingress protections of IP6X according to IEC60529 and Dust-tight conduit seals must be used.

Equipment that is FM-approved for intrinsic safety may be connected to barriers based on the ENTITY CONCEPT. This concept permits interconnection of approved transmitters, meters and other devices in combinations which have not been specifically examined by FM, provided that the agency's criteria are met. The combination is then intrinsically safe, if the entity concept is acceptable to the authority having jurisdiction over the installation.

The entity concept criteria are as follows:

The intrinsically safe devices, other than barriers, must not be a source of power. The maximum voltage Ui(V_{MAX}) and current Ii(I_{MAX}), and maximum power Pi(Pmax), which the device can receive and remain intrinsically safe, must be equal to or greater than the voltage (Uo or V_{OC} or V_t) and current (Io or I_{SC} or I_t) and the power Po which can be delivered by the barrier.

The sum of the maximum unprotected capacitance (C_i) for each intrinsically device and the interconnecting wiring must be less than the capacitance (C_a) which can be safely connected to the barrier.

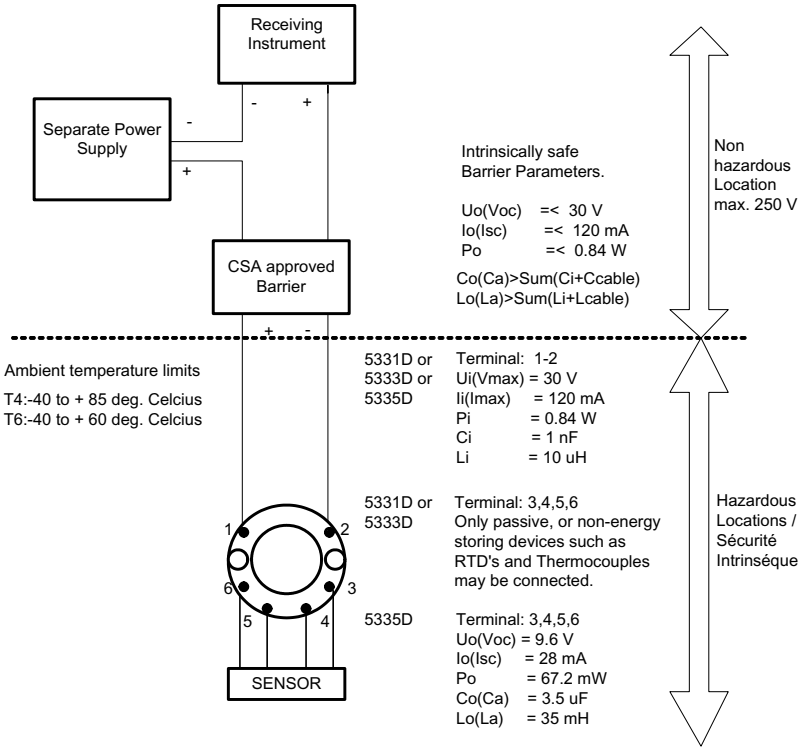
The sum of the maximum unprotected inductance (L_i) for each intrinsically device and the interconnecting wiring must be less than the inductance (L_a) which can be safely connected to the barrier.

The entity parameters Uo,V_{OC} or V_t and Io,I_{SC} or I_t, and C_a and L_a for barriers are provided by the barrier manufacturer.

CSA Installation Drawing 533XQC03.

5331D, 5333D and 5335D transmitters are intrinsically safe in Zone 0 Group IIC or Class I, Division1, Group A,B,C,D when installed according to Installation Drawing.

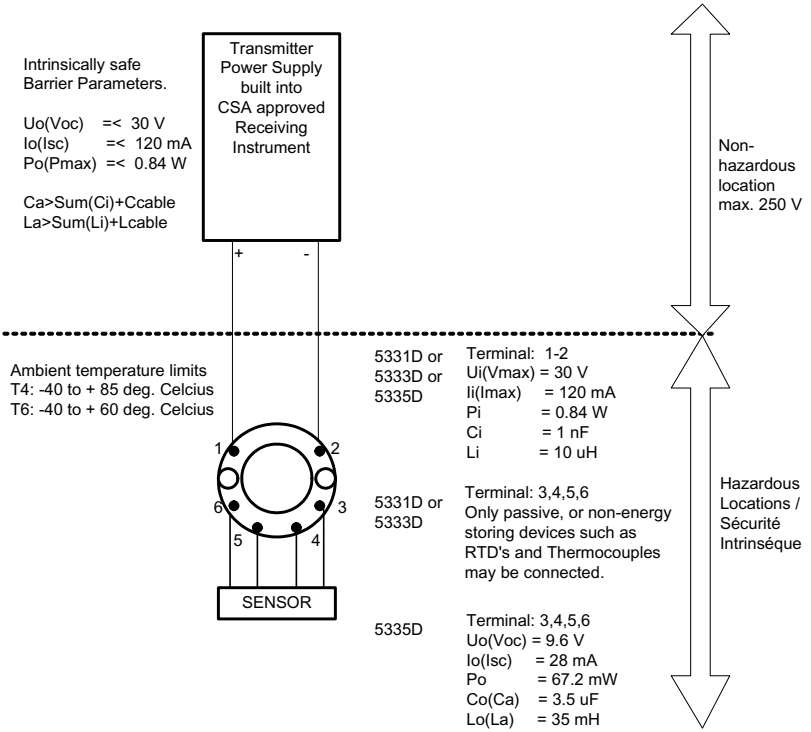
1. Connections with separate power supply and receiver.
Output: Standard 4 – 20 mA loop



Warning:
Substitution of components may impair intrinsic safety.

The transmitters must be installed in a suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC).

2. Connection with power supply and barrier built into receiver.
Output: Standard 4 - 20 mA loop



Warning:
Substitution of components may impair intrinsic safety.

The Transmitters must be installed in a suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC).

08/2012 A/1-/Nr.:419 287

Quality for the future

KONFORMITÄTSERKLÄRUNG

Als Hersteller bescheinigt

PR electronics A/S

Lerbakken 10

DK-8410 Rønde

hiermit für das folgende Produkt

Typ: 5331

Name: 2-Draht Universal Messumformer

die Konformität mit folgenden Richtlinien und Normen:
EMV-Richtlinien 89/336/EEC und nachfolgende Änderungen

Ab der Serien-Nr.: 990303001 ff.

EN 61 326

EN 50 081-1, EN 50 081-2

EN 50 082-1, EN 50 082-2

Diese Erklärung ist in Übereinstimmung mit Artikel 10, Unterklausel 1 der EMV-Richtlinie ausgestellt. Zur Spezifikation des zulässigen Erfüllungsgrades, siehe die elektrischen Daten des Moduls.
Die ATEX Richtlinien 94/9/EC und nachfolgende Änderungen

Ab der Serien-Nr.: 990303001 ff.

EN 50 014, EN 50 020,

EN 50281-1-1 und EN 50284

Ex-Zertifikat: 99 ATEX 126962

Zulassungsstelle für CENELEC/ATEX: UL International Demko A/S 0539

Rønde, 04. Jan. 2000

Peter Rasmussen
Unterschrift des Herstellers

Notizen:

Notizen:

06/2012 Art.-Nr. 419 287