5350

PROFIBUS® PA / FOUNDATION™ Fieldbus Transmitter

No. 5350V112-UK
From ser. no. 090659001

DK PR electronics A/S tilbyder et bredt program af analoge og digitale signalbehandlingsmoduler til industriel automation. Programmet består af Isolatorer, Displays, Ex-barrierer, Temperaturtransmittere, Universaltransmittere mfl. Vi har modulerne, du kan stole på i selv barske miljøer med elektrisk støj, vibrationer og temperaturudsving, og alle produkter opfylder de strengeste internationale standarder. Vores motto »Signals the Best« er indbegrebet af denne filosofi – og din garanti for kvalitet.

UK PR electronics A/S offers a wide range of analogue and digital signal conditioning devices for industrial automation. The product range includes Isolators, Displays, Ex Interfaces, Temperature Transmitters, and Universal Devices. You can trust our products in the most extreme environments with electrical noise, vibrations and temperature fluctuations, and all products comply with the most exacting international standards. »Signals the Best« is the epitome of our philosophy – and your guarantee for quality.

FR PR electronics A/S offre une large gamme de produits pour le traitement des signaux analogiques et numériques dans tous les domaines industriels. La gamme de produits s'étend des transmetteurs de température aux afficheurs, des isolateurs aux interfaces SI, jusqu'aux modules universels. Vous pouvez compter sur nos produits même dans les conditions d'utilisation sévères, p.ex. bruit électrique, vibrations et fluctuations de température. Tous nos produits sont conformes aux normes internationales les plus strictes. Notre devise »SIGNALS the BEST« c'est notre ligne de conduite - et pour vous l'assurance de la meilleure qualité.

DE PR electronics A/S verfügt über ein breites Produktprogramm an analogen und digitalen SignalverarbeitungsGeräte für die industrielle Automatisierung. Dieses Programm umfasst Displays, Temperaturtransmitter, Ex- und galvanische Signaltrenner, und Universalgeräte. Sie können unsere Geräte auch unter extremen Einsatzbedingungen wie elektrisches Rauschen, Erschütterungen und Temperaturschwingungen vertrauen, und alle Produkte von PR electronics werden in Übereinstimmung mit den strengsten internationalen Normen produziert. »Signals the Best« ist Ihre Garantie für Qualität!

PROFIBUS® PA / FOUNDATION™ FIELDBUS TRANSMITTER

PRetrans 5350

Contents

PROFIBUS® PA / FOUNDATION™ FIELDBUS TRANSMITTER - PRetop 5350

- *PROFIBUS® PA ver. 3.0*
- *FOUNDATION™ Fieldbus ver. ITK 4.6*
- *Automatic switch between protocols*
- *FISCO-certified*
- *Basic capability with F.F.*

Application

- Linearised temperature measurement with RTD or TC sensor.
- Difference, average or redundancy temperature measurement with RTD or TC sensor.
- Linear resistance, potentiometer and bipolar mV measurement.

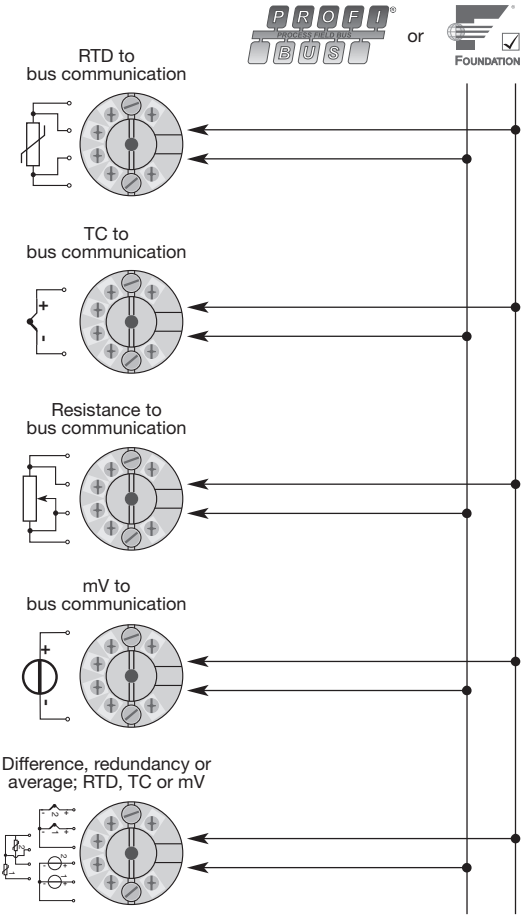
Technical characteristics

- Bus transmitter with both PROFIBUS® PA and FOUNDATION™ Fieldbus communication. A unique switch function ensures automatic shift between the two protocols.
- Set-up for PROFIBUS® PA can be done via Siemens Simatic® PDM®, ABB Melody / Harmony and Metso DNA software and for FOUNDATION™ Fieldbus via Emerson DeltaV, Yokogawa CS 1000 / CS 3000, ABB Melody / Harmony and Honeywell Experion software.
- The simulation mode function can be activated by way of a magnet.
- Polarity-independent bus connection.
- 24 bit A/D converter ensures high resolution.
- PROFIBUS® PA function blocks: 2 analogue.
- FOUNDATION™ Fieldbus function blocks: 2 analogue and 1 PID.
- FOUNDATION™ Fieldbus capability: Basic or LAS.

Mounting / installation

- For DIN form B sensor head mounting. In non-hazardous areas the 5350 can be mounted on a DIN rail with the PR fitting type 8421.

APPLICATIONS



Order codes for 5350

Type	Version
5350	Standard, Zone 2 . . . . . : A ATEX, IECEx, FM, CSA, INMETRO & NEPSI . . : B

***NB!** Please remember to order PR sim pin type 8422 if the simulation mode function is to be used.

Electrical specifications

Specifications range:

-40°C to +85°C

Common specifications:

Supply voltage, DC
- Standard ..... 9.0...32 V
- ATEX, IECEx, FM, CSA, INMETRO & NEPSI ..... 9.0...30 V
- In FISCO installations ..... 9.0...17.5 V

Consumption ..... < 11 mA
Max. current increase in the event of an error ..... < 7 mA
Isolation voltage, test ..... 1.5 kVAC for 60 s
Isolation voltage, operation ..... 50 VRMS / 75 VDC
Warm-up time ..... 30 s
Signal / noise ratio ..... Min. 60 dB
Response time (programmable) ..... 1...60 s
Updating time ..... < 400 ms
Execution time, analogue input ..... < 50 ms
Signal dynamics, input ..... 24 bit
Calibration temperature ..... 20...28°C
Accuracy, the greater of general and basic values:

General values		
Input type	Absolute accuracy	Temperature coefficient
All	≤ ±0.05% of reading	≤ ±0.002% of reading / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
Pt100 and Pt1000	≤ ±0.1°C	≤ ±0.002°C / °C
Ni100	≤ ±0.15°C	≤ ±0.002°C / °C
Cu10	≤ ±1.3°C	≤ ±0.02°C / °C
Lin. R	≤ ±0.05 Ω	≤ ±0.002 Ω / °C
Volt	≤ ±10 µV	≤ ±0.2 µV / °C
TC type: E, J, K, L, N, T, U	≤ ±0.5°C	≤ ±0.010°C / °C
TC type: B, R, S, W3, W5	≤ ±1°C	≤ ±0.025°C / °C

EMC immunity influence ..... < ±0.1% of reading
Extended EMC immunity:
NAMUR NE 21, A criterion, burst ..... < ±1% of reading

Vibration (DIN class B) ..... IEC 60068-2-6 and IEC 60068-2-64
4 g / 2...100 Hz
Humidity ..... < 95% RH (non cond.)
Dimensions..... Ø 44 x 20.2 mm
Protection degree (enclosure / terminal)..... IP68 / IP00
Weight ..... 55 g

Electrical specifications, input:

RTD and linear resistance input:

RTD type	Min. value	Max. value	Standard
Pt25...Pt1000	-200°C	+850°C	IEC60751/JIS C 1604
Ni25...Ni1000	-60°C	+250°C	DIN 43760
Cu10...Cu1000	-50°C	+200°C	α = 0.00427
Lin. resistance	0 Ω	10 kΩ	-
Potentiometer	0 Ω	100 kΩ	-

Cable resistance per wire..... 50 Ω
Sensor current..... Nom. 0.2 mA
Effect of sensor cable resistance (3- / 4-wire) < 0.002 Ω / Ω
Sensor error detection ..... Yes
Short circuit detection..... < 15 Ω

TC input:

Type	Min. value	Max. value	Standard
B	+400°C	+1820°C	IEC584
E	-100°C	+1000°C	IEC584
J	-100°C	+1200°C	IEC584
K	-180°C	+1372°C	IEC584
L	-200°C	+900°C	DIN 43710
N	-180°C	+1300°C	IEC584
R	-50°C	+1760°C	IEC584
S	-50°C	+1760°C	IEC584
T	-200°C	+400°C	IEC584
U	-200°C	+600°C	DIN 43710
W3	0°C	+2300°C	ASTM E988-90
W5	0°C	+2300°C	ASTM E988-90
Ext. CJC	-40°C	+135°C	IEC6075

Cold junction compensation (CJC) ..... < ±0.5 °C
Sensor error detection ..... Yes
Sensor error current:
when detecting ..... Nom. 4 μA
else ..... 0 μA
Short circuit detection ..... < 3 mV

Voltage input:

Measurement range ..... -800...+800 mV
Input resistance ..... 10 MΩ

Output:

PROFIBUS® PA connection:

PROFIBUS® PA protocol ..... Profile A&B, ver. 3.0
PROFIBUS® PA protocol standard ..... EN 50170 vol. 2
PROFIBUS® PA address (at delivery) 126
PROFIBUS® PA function blocks ..... 2 analogue

FOUNDATION™ Fieldbus connection:

FOUNDATION™ Fieldbus protocol ..... FF protocol
FOUNDATION™ Fieldbus protocol standard .. FF design specifications
FOUNDATION™ Fieldbus capability ..... Basic or LAS
FOUNDATION™ Fieldbus version ..... ITK 4.6
FOUNDATION™ Fieldbus function blocks ..... 2 analogue and 1 PID

Approvals:

EMC 2004/108/EC ..... EN 61326-1
GOST R

I.S. / Ex:

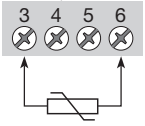
ATEX 94/9/EC
- 5350A..... KEMA 03ATEX1011 X
- 5350B..... KEMA 02ATEX1318

IECEx..... IECEx BVS 12.0035 X
FM FM-3015609
c CSA us CSA-1418937
INMETRO ..... NCC 12.1009 X
NEPSI GYJ091290X
GOST Ex

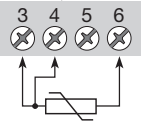
INPUT CONNECTIONS

Input:

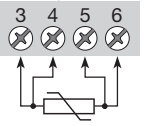
RTD, 2-wire



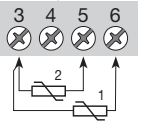
RTD, 3-wire



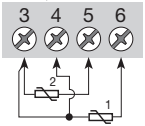
RTD, 4-wire



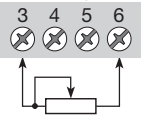
2 x RTD, 2-wire



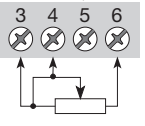
2 x RTD, 2- / 3-wire



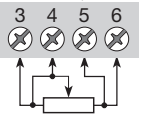
Resistance, 2-wire



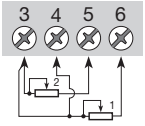
Resistance, 3-wire



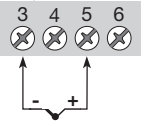
Resistance, 4-wire



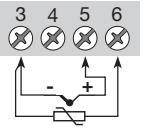
2 x resistance, 2- / 3-wire



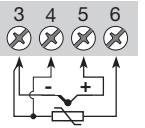
TC, internal CJC



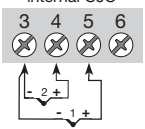
TC, 2-wire external CJC



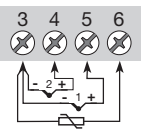
TC, 3-wire external CJC



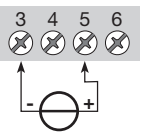
2 x TC, internal CJC



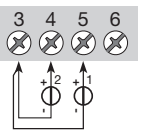
2 x TC, 2-wire CJC



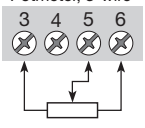
mV



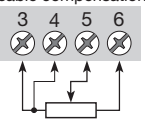
2 x mV



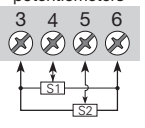
Potmeter, 3-wire



Potmeter, cable compensation

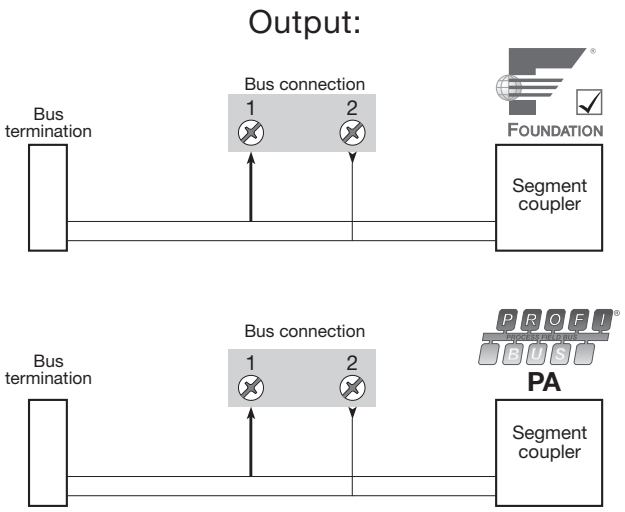


Two 3-wire potentiometers

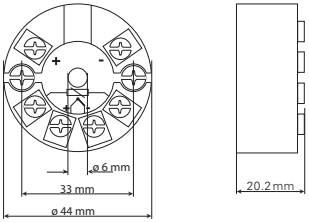


Connections with two sensors can be configured for 2 measurements, difference, average or redundancy

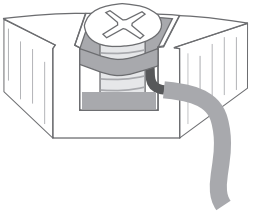
OUTPUT CONNECTIONS



Mechanical specifications

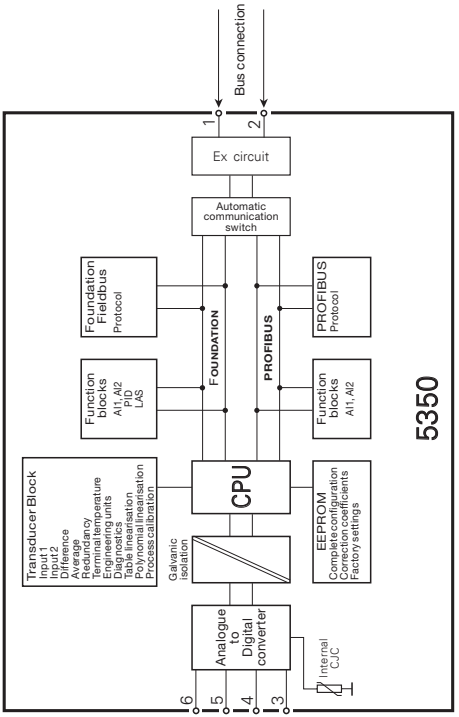


Mounting of sensor wires

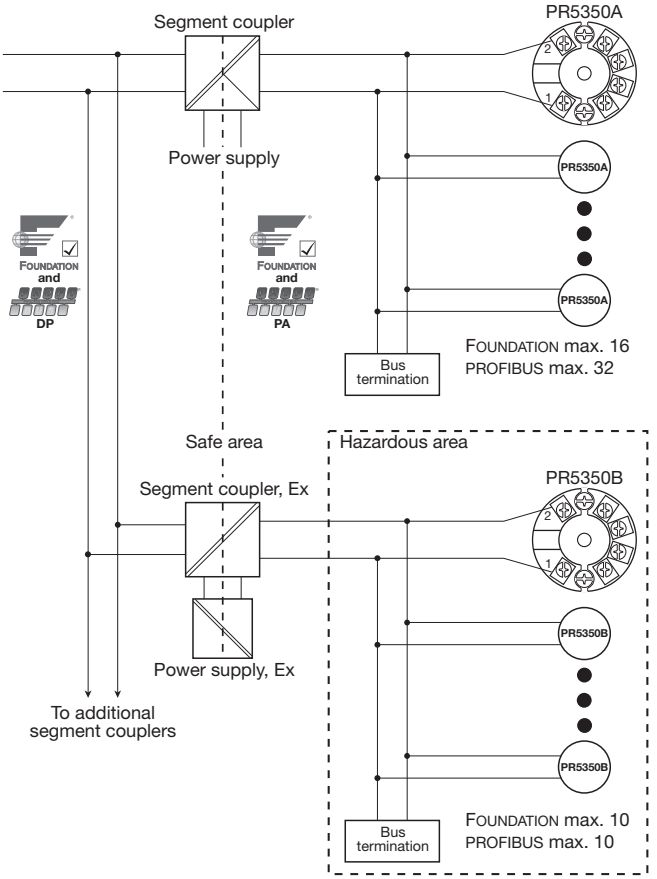


Wires must be mounted between the metal plates.

BLOCK DIAGRAM



BUS INSTALLATION



APPENDIX

ATEX Installation Drawing - 5350A

ATEX Installation drawing - 5350B

FM & CSA Installation Drawing No. 5350QE01

NEPSI Installation Drawing

IECEX Installation Drawing

INMETRO Instruções de Segurança

ATEX Installation drawing

5350

For safe installation of 5350A 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 03ATEX 1011X

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

T4: -40 ≤ Ta ≤ 85ºC
T6: -40 ≤ Ta ≤ 60ºC

Standards EN 60079-0 : 2006, EN 60079-11 : 2007, EN 60079-15 : 2005, EN 60079-27 : 2006

Terminal: 3,4,5,6	**Terminal: 1,2** Ex nA	**Terminal: 1,2** Ex nL or Ex ic	**Terminal: 1,2** FNICO
Uo: 5.7 V Io: 8.4 mA Po: 12 mW Lo: 200 mH Co: 40 µF	U ≤ 32 VDC	Ui = 32 VDC Li = 1 µH Ci = 2.0 nF	Ui = 17.5 VDC Li = 1 µH Ci = 2.0 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 EN 60529. 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

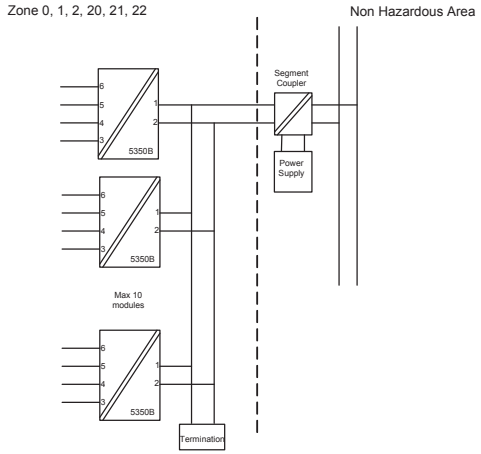
5350

For safe installation of 5350B 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 02ATEX 1318

Marking II 1 G Ex ia IIC T6..T4 or
II 2 (1) G Ex ib [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, EN 60079-27 : 2008



Supply, terminal 1,2 for Ex ia IIC					Supply, terminal 1,2 for Ex ib IIC		
Unit	**Barrier where P_o < 0.84 W**	**Barrier where P_o < 1.3 W**	**Suitable for FISCO systems**	**Suitable for FISCO systems**	**Unit**	**Barrier where P_o < 5.32 W**	**FISCO segment coupler**
U_i	30 VDC	30 VDC	17.5 VDC	15 VDC	U_i	30 VDC	17.5 VDC
I_i	120 mADC	300 mADC	250 mADC	900 mADC	I_i	250 mADC	any
P_i	0.84 W	1.3 W	2.0 W	5.32 W	P_i	5.32 W	any
L_i	1 µH	1 µH	1 µH	1 µH	L_i	1 µH	1 µH
C_i	2 nF	2 nF	2 nF	2 nF	C_i	2 nF	2 nF
T1..T4	T_{amb} < 85ºC	T_{amb} < 75ºC	T_{amb} < 85ºC	T_{amb} < 85ºC	T1..T4	T_{amb} < 85ºC	T_{amb} < 85ºC
T5	T_{amb} < 70ºC	T_{amb} < 65ºC	T_{amb} < 60ºC	T_{amb} < 60ºC	T5	T_{amb} < 75ºC	T_{amb} < 75ºC
T6	T_{amb} < 60ºC	T_{amb} < 45ºC	T_{amb} < 45ºC	T_{amb} < 45ºC	T6	T_{amb} < 60ºC	T_{amb} < 60ºC

Sensor input, terminal 3,4,5 and 6

Uo ..... : 5.7 VDC
Io ..... : 8.4 mA
Po..... : 12 mW
Lo ..... : 200 mH
Co..... : 40 µF

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 EN 60529.

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:

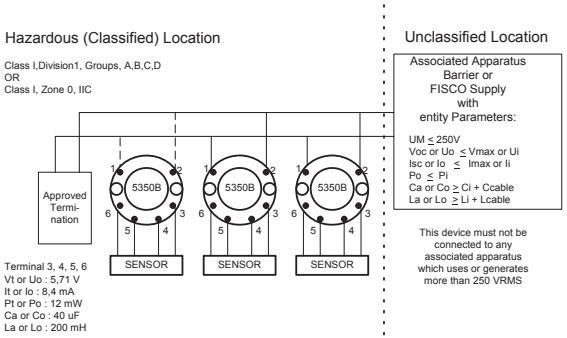
The transmitter shall be mounted in a metal enclosure form B according to DIN 43729 that is providing a degree of protection of at least IP6X according to EN 60529, that is suitable for the application and correctly installed.

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.

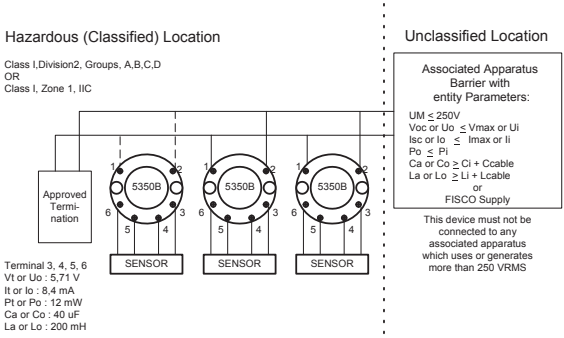
FM/CSA Installation drawing



Terminal 1,2				
Class I, Zone 0, Ex ia IIC, Entity / FISCO				
IS, Class I, Division 1, Group A, B, C, D Entity / FISCO				
Barrier type:	Linear barrier	Trapezoid barrier	Suitable for FISCO systems	Suitable for FISCO systems
T1..T4:	Ta ≤ +85ºC	Ta ≤ +75ºC	Ta ≤ +85ºC	Ta ≤ +85ºC
T5:	Ta ≤ +70ºC	Ta ≤ +65ºC	Ta ≤ +60ºC	Ta ≤ +60ºC
T6:	Ta ≤ +60ºC	Ta ≤ +45ºC	Ta ≤ +45ºC	Ta ≤ +45ºC
Vmax or Ui	30 V	30 V	17.5 V	15 V
Imax or Ii	120 mA	300 mA	250 mA	900 mA
Pi	0.84 W	1.3 W	2.0 W	5.32W
Ci	2.0 nF	2.0 nF	2.0 nF	2.0 nF
Li	1 µH	1 µH	1 µH	1 µH

See Installation notes.

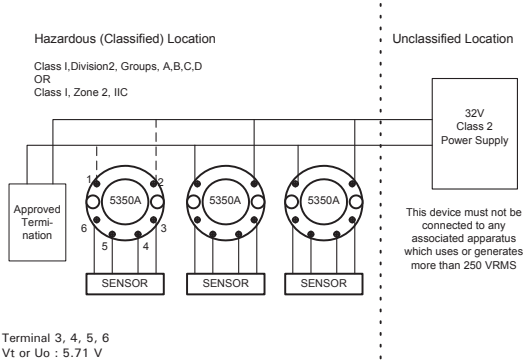
LERBAKKEN 10, 8410 RØNDE DENMARK. WWW.PRELECTRONICS.COM



Entity Parameters		
Terminal 1, 2		
Class I, Zone 1, Ex ib IIC Entity / FISCO		
Barrier type:	Rectangular barrier	FISCO Segment coupler
T1..T4:	Ta ≤ +85ºC	Ta ≤ +85ºC
T5:	Ta ≤ +75ºC	Ta ≤ +75ºC
T6:	Ta ≤ +60ºC	Ta ≤ +60ºC
Vmax / Ui	30 V	17.5 V
Imax or Ii	250 mA	any
Pi	5.32 W	any
Ci	2.0 nF	2.0 nF
Li	1 µH	1 µH

Nonincendive Field Wiring parameters		
Terminal 1, 2		
NI, Class I, Division 2, Group A, B, C, D NIFW/ FNICO		
T1..T4:	Ta ≤ +85ºC	Ta ≤ +85ºC
T5:	Ta ≤ +75ºC	Ta ≤ +75ºC
T6:	Ta ≤ +60ºC	Ta ≤ +60ºC
Vmax / Ui	30 V	17.5 V
Pi	5.32 W	any
Ci	2.0 nF	2.0 nF
Li	1 µH	1 µH
For a current-controlled circuit the parameter Imax is not required and need not be aligned with the parameter Isc or It of the barrier or associated nonincendive field wiring apparatus.		

See Installation notes.



Terminal 3, 4, 5, 6
Vt or Uo : 5.71 V
It or Io : 8.4 mA
Pt or Po : 12 mW
Ca or Co : 40 µF
La or Lo : 200 mH

Terminal 1..2
Ci: 2.0 nF
Li: 1 µH

T1..T4	-40°C ≤ Ta ≤ +85°C
T5	-40°C ≤ Ta ≤ +75°C
T6	-40°C ≤ Ta ≤ +60°C

See installation notes:

Installation notes:

FM / CSA:
For installation in the US the 5350 shall be installed according to the National Electrical Code (ANSI-NFPA 70).
For installation in Canada the transmitter shall be installed in a suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC).

The entity concept:

Equipment that is FM / CSA-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 / CSA, provided that the agency's criteria are met. The combination is 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.

FISCO/FNICO 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:
FISCO: 5 nF and 10 µH.
FNICO: 5 nF and 20 µH

The Nonincendive Field Wiring concept allows the interconnection of nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations. Vmax >= Voc or Vt, Ca >= Ci +Ccable, La >= Li + Lcable"

The Nonincendive Field Wiring concept allows the interconnection of FM-approved nonincendive devices with FNICO parameters not specifically examined in combination as a system when: Uo or Voc or Vt <= Vmax, Po <= Pi

In each I.S. Fieldbus segment only one active source, normally 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 + 0.5 C' 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. 30 m
Length of trunk cable: max. 1 Km
Length of splice: max. 1 m

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. or N.I. reasons. Furthermore, 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 or nonincendive safety of the installation as applicable.
The sensor circuit is not infallibly galvanically isolated from the Fieldbus input circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500 Vac during 1 minute.

Nonincendive Field Wiring Concept:

The Nonincendive Field Wiring concept allows for the interconnection of nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations. Vmax >= Voc or Vt, Ca >= Ci +Ccable, La >= Li + Lcable"

Installation Notes For FISCO and Entity Concepts:

1. The Intrinsic Safety Entity concept allows the interconnection of FM / UL / CSA-approved intrinsically safe devices (Div. 1 or Zone 0 or Zone1), 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 ≥ ΣCi + ΣCcable, La or Lo ≥ ΣLi + ΣLcable, Po ≤ Pi.
2. The Intrinsic Safety FISCO concept allows the interconnection of FM / UL / CSA-approved intrinsically safe devices with FISCO parameters not specifically examined 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. Intrinsically Safe Installation should be in accordance with ANSI/ISA RP12.6.01 (except chapter 5 for FISCO Installations) “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the National Electrical Code® (ANSI/NFPA 70) Sections 504 and 505.
5. The configuration of associated Apparatus must be FM Approvals or UL / CSA Approved under the associated concept.
6. Associated Apparatus manufacturer’s installation drawing must be followed when installing this equipment.
7. The 5350B is approved for Class I, Zone 0, applications. If connecting AEx[ib] associated Apparatus or AEx ib I.S. Apparatus to the 5350B the I.S. circuit is only suitable for Class I, Zone 1, or Class I, Zone 2, and is not suitable for Class I, Zone 0 or Class I, Division 1, Hazardous (Classified) Locations".
8. No revision to drawing without prior FM / UL / CSA Approval.
9. Simple Apparatus is defined as a device that neither generates nor stores more than 1.5 V, 0.1 A or 25 mW.
10. The termination must be NRTL-approved, and the resistor must be infallible.
11. **Warning**:
    For applications in Div. 2 or Zone 2 (Classified Locations) Explosion hazard: Except for nonincendive field circuits, do not disconnect the apparatus unless the area is known to be non hazardous.
12. **Warning:**
    Substitution of Components May Impair Safety.

NEPSI Installation drawing

Transmitter with Bus technology of Series 5350A manufactured by PR Electronics A/S via the test made by NEPSI (National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation have been proved that they are fulfilling the General Requirements according to Article I, GB3836.1-2000 “Electrical equipement using in the Explosive gas Environment” and the specified requirements for “n” series in Article IX, GB3836.8-2000. The symbol of explosive protection applied should be Ex nA(L) II C T4~T6 while the Certificate No. is GYJ0091289U.

Firstly, Note for the use of the products

1. The Symbol U applied after the Cert. No., indicates that this transmitter cannot be applied in explosive environment of danget until the Protection Grade of the box where the transmitter will later on be placed is not lower than IP54 (GB4208), and has been approved by the National Authorized Inspection Body.
2. The rated Voltage for the transmitter should be 32Vd.c. Proper measures should be applied to protect the working voltage from instantaneously jumping up to 40% of the rated Voltage caused by disturbance.
3. The relationship between the temperature Code and ambient temperature is indicated as follows:

Temperature Code	Ambient Temperature
T4	-40~+85
T5	-40~+75
T6	-40~+60

4. the parameters of the transmitter output which will be connected with the inputs of the Sensor
   (X3, X4, X5, X6) are as follows:
   Uo=5.7V Io=8.4V Po=12mW Co=40 μ F lO=200 mH
5. Only when the transmitter is combined with other power-restraint devices which have also
   been tested and approved by the National Authorized Inspection Body and met the requirements of GB3836.1-2000 and GB3836.8-2000 can the explosion protection system be applied in the explosive environment.
   Uo<Ui Io<Ii Po≤Pi Co≤Cc+Ci Lo≥Lc+Li
   Note: Cc, Lc indicated the parameters of distributed electric capacity of connecting cable.
   Ui, Ii, Pi indicted the parameters of the output of other power-restraint devices; Ci, Li indicated the maximum of the external parameter of the power-restraint devices.
6. Users are not allowed to replace the inner electrical parts with permission.
7. The installation, implementation and maintenance of the transmitter should strictly conformt to the Regulation of “Design Code for electricity Equipment used in explosive and flammable environment” in GB50058-1992 and “installation of Electrical Equipment in Dangerous Environment” the Article 15, Electrical Equipment of explosive gas Environment of GB3836.15-2000.

Tranmsitter with Bus technology of Series 5350B manufactured by PR Electronics A/S via the test made by NEPSI (National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation) have been proved that they are fulfilling the General Requirements according to Article I, GB 3836.1-2000 “Electrical equipment using in the Explosive gas Environment” and the specified requirements for “i.” series in Article IX, GB3836.8-2000. The symbol of explosive protection are EX ia IIC T4~T6 or Ex ib(ia) IIC T4~T6 while the Certificate No. is GYJ091290X.

Note for the use of transmitter:

1. The Symbol “X” applied after the Cert. No., indicates that this transmitter cannot be applied in explosive environment of danger until the Protection Grade of the box where the transmitter will later on be placed is not lower thant IP20 (GB4208), and has been approved by the National Authorized Inspection Body. The metallic case must accord to item 8, GB3836.1-2000; the nonmetallic case must accord to item 7.3, GB3638.1-2000.

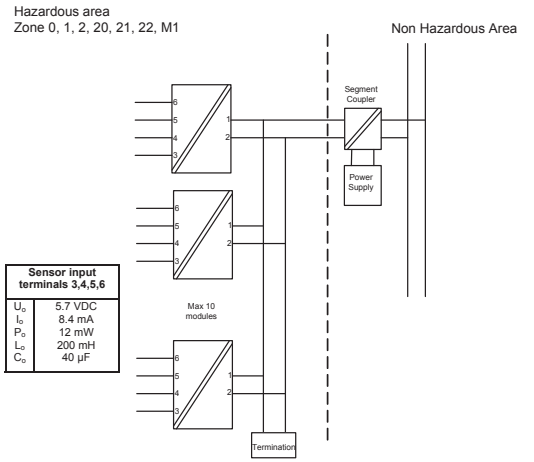
2. The relationship of the explosive protection ingress, the temperature Code, ambient temperature and max. output parameter is indicated as follows:

	Ex ia IIC			Ex ib(ia) II C
T4:	-40°C~+85°C	-40°C~+75°C	-40°C~+85°C	-40°C~+85°C
T5	-40°C~+70°C	-40°C~+65°C	-40°C~+60°C	-40°C~+75°C
T6:	-40°C~+60°C	-40°C~+45°C	-40°C~+45°C	-40°C~+60°C
Ui	30V	30V	17.5V	30V
Ii	120mA	300mA	250mA	250mA
Pi	0.84W	1.3W	2.0W	5.32W

IECEx Installation drawing

For safe installation of 5350 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.

IECEx Certificate	BVS 12.0035X
Marking	Ex ia IIC T6..T4 Ga Ex ib [ia Ga] IIC T6..T4 Gb Ex ia IIIC T135°C Da Ex ia I Ma Ex nA [ic] IIC T6..T4 Gc Ex ic IIC T6..T4 Gc
Standards	IEC60079-11:2011, IEC60079-0: 2011, IEC60079-15: 2010



Supply, terminal 1,2 Ex ia IIC T6..T4 Ga or Ex ia IIIC Da or Ex ia I Ma					Supply, terminal 1,2 Ex ib [ia Ga] IIC T6..T4 Gb		
Unit	**Barrier where P_o < 0.84 W**	**Barrier where P_o < 1.3 W**	**Suitable for FISCO systems**	**Suitable for FISCO systems**	**Unit**	**Barrier where P_o < 5.32 W**	**FISCO segment coupler**
U_i	30 VDC	30 VDC	17.5 VDC	15 VDC	U_i	30 VDC	17.5 VDC
I_i	120 mADC	300 mADC	250 mADC	900 mADC	I_i	250 mADC	any
P_i	0.84 W	1.3 W	2.0 W	5.32 W	P_i	5.32 W	any
L_i	1 µH	1 µH	1 µH	1 µH	L_i	1 µH	1 µH
C_i	2 nF	2 nF	2 nF	2 nF	C_i	2 nF	2 nF
T1..T4	$T_{amb.}$< 85ºC	$T_{amb.}$< 75ºC	$T_{amb.}$< 85ºC	$T_{amb.}$< 85ºC	T1..T4	$T_{amb.}$< 85ºC	$T_{amb.}$< 85ºC
T5	$T_{amb.}$< 70ºC	$T_{amb.}$< 65ºC	$T_{amb.}$< 60ºC	$T_{amb.}$< 60ºC	T5	$T_{amb.}$< 75ºC	$T_{amb.}$< 75ºC
T6	$T_{amb.}$< 60ºC	$T_{amb.}$< 45ºC	$T_{amb.}$< 45ºC	$T_{amb.}$< 45ºC	T6	$T_{amb.}$< 60ºC	$T_{amb.}$< 60ºC

Supply, terminal 1,2 Ex nA [ic] IIC T6..T4 Gc or Ex ic IIC T6..T4 Gc	
U_i	Max 32 VDC
L_i	1 µH
C_i	2 nF
T1..T4	$T_{amb.}$< 85ºC
T5	$T_{amb.}$< 75ºC
T6	$T_{amb.}$< 60ºC

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.

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

For installation in a potentially explosive gas atmosphere requiring EPL Ga or EPL Gb, the following instructions apply:
The transmitter shall be mounted in an enclosure that is providing a degree of protection of at least IP54 according to IEC 60529 that is suitable for the application and correctly installed.

For installation in a potentially explosive dust atmosphere requiring EPL Da or EPL Db, the following instructions apply:
The transmitter shall be mounted in an Form B enclosure according to DIN 43729, that is providing a degree of protection of at least IP6X according to IEC 60079-0 and IEC 60079-31"Equipment dust ignition protection by enclosure tD" 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.
Maximum surface temperature with a 5 mm layer of dust is T 135°C.

For installation in mines the following instructions apply:
The transmitter shall be mounted in a metal enclosure that is providing a degree of protection of at least IP6X according to IEC 60529, and 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 installation in a potentially explosive gas atmosphere requiring EPL Gc the following instructions apply:
The transmitter shall be mounted in an enclosure according to IEC 60079-15, that is suitable for the application and correctly installed.

INMETRO Instruções de Segurança

Dados Ex:

Ex ia IIC T4…T6 Ga
Ex ib [ia Ga] IIC T4 ... T6 Gb
Ex ia IIIC T 135 °C Da
Ex ia I Ma
Ex nA [ic] T4 ... T6 Gc
Ex ic IIC T4 ... T6 Gc

Certificado:: NCC 12.1009 X

Instalação Ex:

Para a instalação segura do transmissor 5350B em áreas classificadas, deve-se observar o seguinte: O módulo necessita ser instalado somente por pessoal qualificado e que tenham familiaridade com normas internacionais, diretivas e normalização aplicadas à estas áreas.

O ano de fabricação do instrumento pode ser obtido, observando-se os primeiros dois dígitos do seu número de série.

O circuito do sensor não está com isolação galvânica total em relação ao circuito de entrada. Todavia a isolação galvânica entre os circuitos é capaz de suportar teste de voltagem de 500Vac durante 1 minuto.

O transmissor precisa ser montado em um invólucro com um grau de proteção pelo menos IP-20.
Em atmosferas explosivas compostas por misturas de ar / poeira:

O transmissor somente poderá ser instalado em uma atmosfera potencialmente explosiva composta por poeira combustível se estiver montado no interior de um invólucro metálico forma B de acordo com a norma DIN 43729 com um grau de proteção pelo menos IP-6X de acordo com a norma IEC 60529, que seja adequado para esta aplicação e corretamente instalado.

As entradas dos cabos e outras barreiras a serem utilizadas devem ser adequadas e corretamente instaladas.

Onde a temperatura ambiente for ≥ 60ºC, devem ser utilizados cabos resistentes ao calor que resistam pelo menos 20K acima da temperatura ambiente.

Se o invólucro onde o transmissor está montado for feito de alumínio e instalado em Zona 0, 1 ou Zona 20,21 ou 22, este não deve conter mais do que 6% do seu peso total de magnésio e titânio.

Acessórios adicionais ao invólucro devem ser projetados e/ou instalados de tal modo que até mesmo eventos de rara incidência , fontes de ignição causadas por impactos e faíscas por fricção sejam excluídas.

Sinal de saída / alimentação , terminal 1 e 2

Ex ia IIC T6 ... T4 Ga
FISCO

Temp. ambiente max. depende de Po da barreira conectada.

Unidade	Barreira onde P_o < 0.85 W	Barreira onde P_o < 1.3 W	Adequado parasistemas FISCO	Adequado parasistemas FISCO
U_i	30 VDC	30 VDC	17.5 VDC	15 VDC
I_i	120 mADC	300 mADC	250 mADC	900 mADC
P_i	0.84 W	1.3 W	2.0 W	5.32 W
L_i	1 µH	1 µH	1 µH	1 µH
C_i	2 nF	2 nF	2 nF	2 nF
T1..T4	$T_{amb.}$< 85ºC	$T_{amb.}$< 75ºC	$T_{amb.}$< 85ºC	$T_{amb.}$< 85ºC
T5	$T_{amb.}$< 70ºC	$T_{amb.}$< 65ºC	$T_{amb.}$< 60ºC	$T_{amb.}$< 60ºC
T6	$T_{amb.}$< 60ºC	$T_{amb.}$< 45ºC	$T_{amb.}$< 45ºC	$T_{amb.}$< 45ºC
Group I	$T_{amb.}$< 85ºC	$T_{amb.}$< 85ºC	$T_{amb.}$< 85ºC	$T_{amb.}$< 85ºC

Sinal de saída / alimentação , terminal 1 e 2

Ex ib [ia Ga] IIC T6 ... T4 Gb
FISCO

Temp. ambiente max. depende de Po da barreira conectada.

Unidade	Barrier where P_o < 5.32 W	FISCO segment coupler
U_i	30 VDC	17.5 VDC
I_i	250 mADC	Qualquer
P_i	5.32 W	Qualquer
L_i	1 µH	1 µH
C_i	2 nF	2 nF
T1..T4	$T_{amb.}$< 85ºC	$T_{amb.}$< 85ºC
T5	$T_{amb.}$< 75ºC	$T_{amb.}$< 75ºC
T6	$T_{amb.}$< 60ºC	$T_{amb.}$< 60ºC
Group I	$T_{amb.}$< 85ºC	$T_{amb.}$< 85ºC

Sinal de saída / alimentação , terminal 1 e 2

Ex ic IIC T6 ... T4 Gc
FISCO

Temp. ambiente max. depende de Po da barreira conectada.

Unidade		
Ui	32 VDC	
I_i	Qualquer	
P_i	Qualquer	
L_i	1 µH	
C_i	2 nF	
T1..T4	$T_{amb.}$< 85ºC	
T5	$T_{amb.}$< 75ºC	
T6	$T_{amb.}$< 60ºC	
Group I	$T_{amb.}$< 85ºC	

Entrada do sensor, terminais 3, 4, 5 e 6:
Uo ..... : 5,7 VDC
Io ..... : 8,4 mA
Po..... : 12 mW
Lo.....: 200 mH
Co..... : 40 µF

Displays Programmable displays with a wide selection of inputs and outputs for display of temperature, volume and weight, etc. Feature linearisation, scaling, and difference measurement functions for programming via PReset software.

Ex interfaces Interfaces for analogue and digital signals as well as HART® signals between sensors / I/P converters / frequency signals and control systems in Ex zone 0, 1 & 2 and for some devices in zone 20, 21 & 22.

Isolation Galvanic isolators for analogue and digital signals as well as HART® signals. A wide product range with both loop-powered and universal isolators featuring linearisation, inversion, and scaling of output signals.

Temperature A wide selection of transmitters for DIN form B mounting and DIN rail devices with analogue and digital bus communication ranging from application-specific to multifunctional transmitters.

Multifunctional PC or front programmable devices with universal options for input, output and supply. This range offers a number of advanced features such as process calibration, linearisation and auto-diagnosis.

www.prelectronics.fr
sales@prelectronics.fr

www.prelectronics.de
sales@prelectronics.de

www.prelectronics.es
sales@prelectronics.es

www.prelectronics.it
sales@prelectronics.it

www.prelectronics.se
sales@prelectronics.se

www.prelectronics.co.uk
sales@prelectronics.co.uk

www.prelectronics.com
sales@prelectronics.com

www.prelectronics.cn
sales@prelectronics.cn

Head office

Denmark
PR electronics A/S
Lerbakken 10
DK-8410 Rønde

www.prelectronics.com
sales@prelectronics.dk
tel. +45 86 37 26 77
fax +45 86 37 30 85