PR electronics

5350

Модуль со связью через PROFIBUS® PA / FOUNDATION™ Fieldbus

№ 5350L110-RU (0911)

Отсерийного № 030640001

SIGNALS THE BEST

RU ▶ PR Electronics предлагает обширную программу аналоговых и дискретных модулей обработки сигналов для целей промышленной автоматизации. Производственная программа включает барьеры искробезопасности, дисплеи-индикаторы, датчики температуры, универсальные преобразователи и т.д. На наши модули можно положиться в самых тяжелых условиях работы, – с высоким уровнем вибраций и электромагнитных помех и с большими колебаниями температуры. Все наши изделия соответствуют самым жестким международным стандартам. Наш девиз "Signals the Best" отражает эту философию – и служит вашей гарантией качества.

МОДУЛЬ ДЛЯ ПРОМЫШЛЕННЫХ СЕТЕЙ СО СВЯЗЬЮ ЧЕРЕЗ PROFIBUS® PA / FOUNDATION™ FIELDBUS

PRETRANS 5350

СОДЕРЖАНИЕ

ДЕКЛАРАЦИЯ СООТВЕТСТВИЯ ЕС

Изготовитель

PR electronics A/S
Lerbakken 10
DK-8410 Rønde

настоящим заявляет, что изделие:

Тип: 5350
Наименование: Модуль для промышленных сетей со связью через PROFIBUS® PA / FOUNDATION™ Fieldbus

отвечает требованиям следующих директив и стандартов:

Директивы по ЭМС 2004/108/EC и последующих к ней дополнений

EN 61326-1 : 2006

Точную информацию о приемлемом уровне ЭМС см. в электрических данных модуля.

Директивы ATEX 94/9/EC с последующими дополнениями

EN 60079-0 : 2006, EN 60079-11 : 2007,
EN 60079-15 : 2005, EN 60079-26: 2007,
EN 60079-27 : 2006, EN 60079-27 : 2008
EN 61241-0 : 2006 и EN 61241-11 : 2006
Сертификат ATEX: KEMA 03ATEX1011 X (5350A)
Сертификат ATEX: KEMA 02ATEX1318 (5350B)

Уполномоченный орган:

KEMA Quality B.V. (0344)
Utrechtseweg 310, 6812 AR Arnhem
P.O. Box 5185, 6802 ED Arnhem, The Netherlands

Rønde, 21 декабря 2009 г.

Kim Rasmussen
Подпись изготовителя

МОДУЛЬ ДЛЯ ПРОМЫШЛЕННЫХ СЕТЕЙ PROFI-BUS® PA / FOUNDATION™ FIELDBUS - PRETOP 5350

- *Протокол PROFIBUS® PA версия 3.0*
- *Протокол FOUNDATION™ Fieldbus версия ITK 4.6*
- *Функция автоматического переключения*
- *Сертификат FISCO-*
- *Функциональные возможности Basic с F.F.*

Области применения

- Линеаризация температуры, измеренной RTD-датчиком или термопарой.
- Измерение разности температур, с резервным каналом или среднего значения тепературы терморезистивным датчиком или термопарой.
- Измерение сопротивления, потенциометрическое и биполярного mV-сигнала.

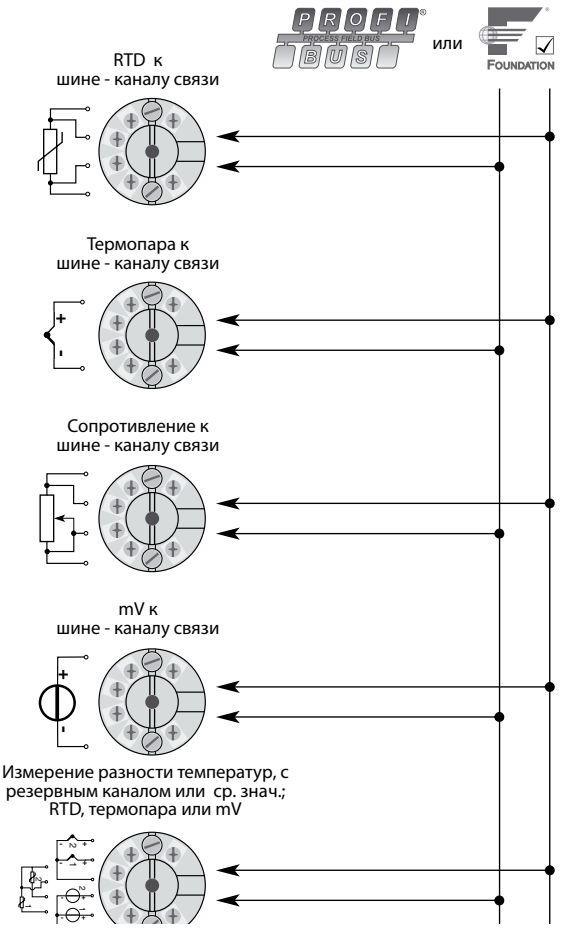
Техническая характеристика

- Шинный модуль, поддерживающий протоколы обмена данными PROFIBUS® PA и FOUNDATION™ Fieldbus. Автоматическое переключение между протоколами.
- Конфигурирование системы PROFIBUS® PA при помощи ПО Siemens Simatic® PDM®, ABB Melody / Harmony и Metso DNA XD, а FOUNDATION™ Fieldbus - при помощи ПО Emerson DeltaV, Yokogawa CS 1000 / CS 3000, ABB Melody / Harmony и Honeywell Experion.
- Посредством магнита можно активировать функцию моделирования.
- Не зависящее от полярности питание от шины.
- 24-битовый АЦП обеспечивает высокое разрешение сигнала.
- Блоки функций PROFIBUS® PA: 2 аналоговых.
- Блоки функций FOUNDATION™ Fieldbus: 2 аналоговых и 1 PID.
- Функциональные возможности FOUNDATION™ Fieldbus: Basic или LAS.

Монтаж / установка

- Может монтироваться в корпус датчика по ст. DIN форма B. Во взрывобезопасных зонах измерительный преобразователь 5350 можно монтировать на рейку DIN при помощи PR крепления тип 8421.

СХЕМЫ ПРИМЕНЕНИЙ



Расшифровка кода заказа: 5350

Тип	Исполнение	
5350	Стандарт ATEX, FM и CSA	: A : B

***Внимание!** Заказывайте PR sim-ключ тип 8422, если желательно задействовать функцию моделирования.

Электрические данные

Диапазон рабочих температур среды:

От -40°C до +85°C

Общие данные:

Напряжение питания, DC
- Стандартное исполнение ..... 9,0...32 V
- ATEX, FM и CSA ..... 9,0...30 V
- В FISCO-системах ..... 9...17,5 V

Потребляемая мощность ..... < 11 mA
Макс. повышение потребления тока
в случае сбоя ..... < 7 mA
Изоляция, напряжение тестовое ..... 1,5 kVAC за 60 сек.
Изоляция, напряжение рабочее ..... 50 VRMS / 75 VDC
Время разогрева ..... 30 сек.
Отношение сигнал/шум ..... мин. 60 dB
Время реакции (программируемое) ..... 1...60 сек.
Время актуализации ..... < 400 мсек.
Время выполнения, аналоговый вход ..... < 50 мсек.
Динамический диапазон сигнала, вход ..... 24 bit
Температура калибровки ..... 20...28°C
Точность, большее из общих и базовых значений:

Общие значения		
Типы входов	Абс. погрешность	Зависимость- от температуры
Все	≤ ±0,05% от показа	≤ ±0,002% от показа / °C

Базовые значения		
Типы входов	Основная-погрешность	Зависимость-от температуры
Pt100 и Pt1000	≤ ±0,1°C	≤ ±0,002°C / °C
Ni100	≤ ±0,15°C	≤ ±0,002°C / °C
Cu10	≤ ±1,3°C	≤ ±0,02°C / °C
Лин. R	≤ ±0,05 Ω	≤ ±0,002 Ω / °C
Напряжение	≤ ±10 µV	≤ ±0,2 µV / °C
Типы термопар: E, J, K, L, N, T, U	≤ ±0,5°C	≤ ±0,010°C / °C
Типы термопар: B, R, S, W3, W5	≤ ±1°C	≤ ±0,025°C / °C

Зависимость помехоустойчивости по ЭМС ..... < ±0,1% от показа
Улучшенная помехоустойчивость по ЭМС:
NAMUR NE 21, исп. импульсным напр. уровня A < ±1% от показа

Устойчивость к вибрации (DIN класс B)..... IEC 60068-2-6 и IEC 60068-2-64
4 g / 2...100 Hz
Отн. влажность воздуха ..... < 95% (без конденсата)
Размеры ..... Ø 44 x 20,2 мм
Класс защиты (корпус/клемма)..... IP68 / IP00
Вес ..... 55 г

Электрические данные, вход:

Вход RTD и линейного сопротивления:

Тип - RTD	Мин. значение	Макс. значение	Норма
Pt25...Pt1000	-200°C	+850°C	IEC60751/JIS C 1604
Ni25...Ni1000	-60°C	+250°C	IEC60751
Cu10...Cu1000	-50°C	+200°C	α = 0,00427
Лин. сопрот.	0 Ω	10 kΩ	-
Потенциометр	0 Ω	100 kΩ	-

Сопротивление кабеля на жилу (макс.) ..... 50 Ω
Ток датчика ..... Номинальный 0,2 mA
Влияние сопротивления кабеля (3-/4-жильного) . < 0,002 Ω / Ω
Обнаружитель сбоя датчика ..... да
Обнаружение КЗ ..... < 15 Ω

Вход термопар:

Тип	Мин. значение	Макс. значение	Норма
B	+400°C	+1820°C	IEC 60584-1
E	-100°C	+1000°C	IEC 60584-1
J	-100°C	+1200°C	IEC 60584-1
K	-180°C	+1372°C	IEC 60584-1
L	-200°C	+900°C	DIN 43710
N	-180°C	+1300°C	IEC 60584-1
R	-50°C	+1760°C	IEC 60584-1
S	-50°C	+1760°C	IEC 60584-1
T	-200°C	+400°C	IEC 60584-1
U	-200°C	+600°C	DIN 43710
W3	0°C	+2300°C	ASTM E988-90
W5	0°C	+2300°C	ASTM E988-90
Внеш. CJC	-40°C	+135°C	IEC60751

Компенсация холодного спая (CJC) ..... < ±0,5 °C
Обнаружение сбоя датчика..... да
Ток обнаружения сбоя датчика:
в процессе обнаружения..... номинальный 4 µA
иначе ..... 0 µA
Обнаружение КЗ ..... < 3 mV

Вход напряжения:

Диапазон измерения..... -800...+800 mV
Входное сопротивление ..... 10 MΩ

Выход:

Система PROFIBUS® PA:

Протокол PROFIBUS® PA ..... Profil A&B, версия 3.0
Стандарт протокола PROFIBUS® PA ..... EN 50170 том 2
Адрес PROFIBUS® PA (при поставке)..... 126
Блоки функций PROFIBUS® PA..... 2 аналоговых

Система FOUNDATION™ Fieldbus:

Протокол FOUNDATION™ Fieldbus..... FF-протокол
Стандарт протоколаFOUNDATION™ Fieldbus ... Констр. спецификации FF
Функц. возможности FOUNDATION™ Fieldbus.. LAS или Basic
Версия FOUNDATION™ Fieldbus ..... ITK 4.6
Блоки функций FOUNDATION™ Fieldbus ..... 2 аналоговых и 1 PID

СОДЕРЖАНИЕ

Сертификация по Ex - 5350A:

KEMA 03ATEX1011 X	II 3 GD Ex nA [nL] IIC T4...T6 или II 3 GD Ex nL IIC T4...T6 или II 3 GD Ex nA [ic] IIC T4...T6 или II 3 GD Ex ic IIC T4...T6
ATEX установочная схема №	5350QE01
FM и CSA	IS, Class I, Div. 2, Group A, B, C, D IS, Class I, Zone 2, Group IIC
NEPSI	GYJ0091289U Ex nA [L] IIC T4~T6

Сертификация по Ex / I.S. - 5350B:

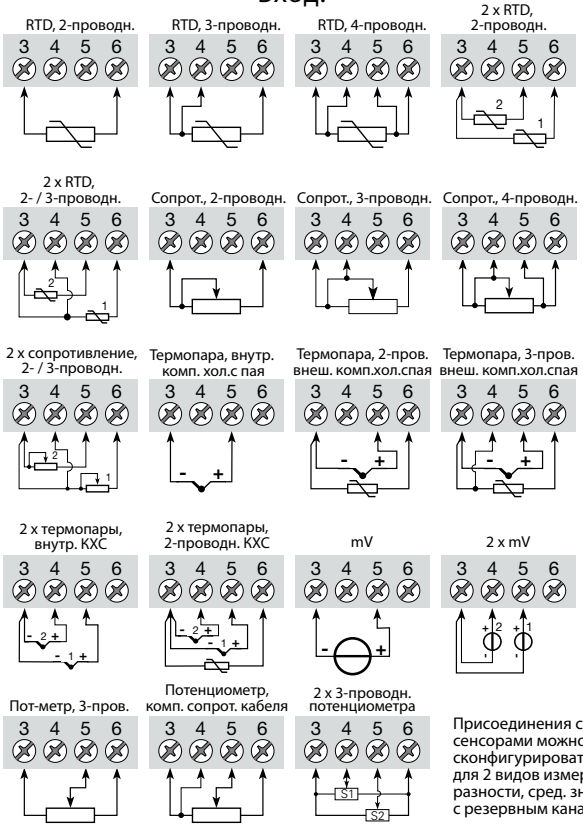
KEMA 02ATEX1318	II 1 G Ex ia IIC T4...T6 или II 2 (1) G Ex ib [ia] IIC T4...T6 II 1 D Ex iaD
Разрешение к применению в зоне	0, 1, 2, 20, 21 или 22
ATEX установочная схема №	5350QE01
FM и CSA	IS, Class I, Div. 1, Group A, B, C, D IS, Class I, Zone 0/1, Group IIC IS, Class I, Div. 2, Group A, B, C, D
FM и CSA установочная схема №	5350QE01
INMETRO 08/UL-BRCO-0019	BR-Ex ia IIC T4, T5, T6 или BR-Ex ib [ia] IIC T4, T5, T6
INMETRO установочная схема №	5350QE01
NEPSI	GYJ091290X Ex ia IIC T4~T6 Ex ib [ia] IIC T4~T6
NEPSI установочная схема №	5350QE01

Сертификат соответствия ГОСТ Р:

VNIIM и VNIIFTRI, № серт...	См. www.prelectronics.com

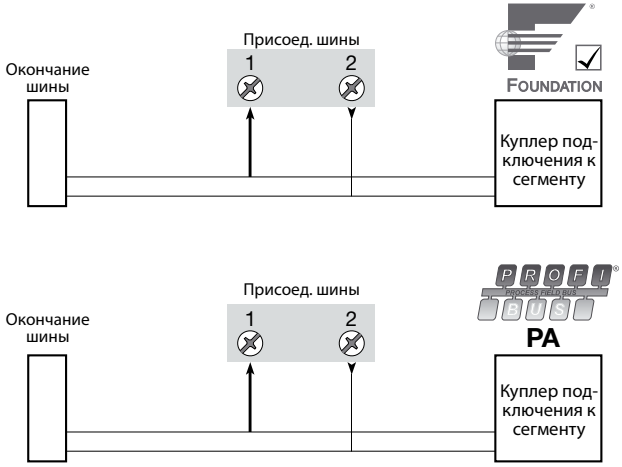
Выполняет директивные требования:	**Стандарт:**
EMC 2004/108/EC	EN 61326-1
ATEX 94/9/EC	EN 60079-0, EN 60079-11, EN 60079-15, EN 60079-26, EN 60079-27, EN 61241-0 и EN 61241-11
FM	3600, 3610, 3611
CSA, CAN / CSA	C22.2 № 142, № 157, № 213
CAN / CSA	E79-0, -11, -15
ANSI / UL	UL 60079-0, -11, -15
INMETRO	IEC 60079-0 и IEC 60079-11
NEPSI	GB3836.1-2000, GB3836.4-2000, GB3836.8-2003

Вход:

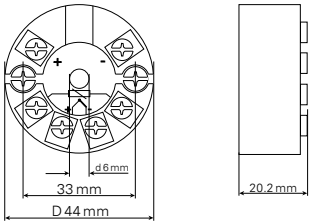


Присоединения с 2 сенсорами можно сконфигурировать для 2 видов измерений: разности, сред. знач. или с резервным каналом

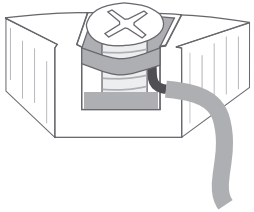
Выход:



Установочные размеры

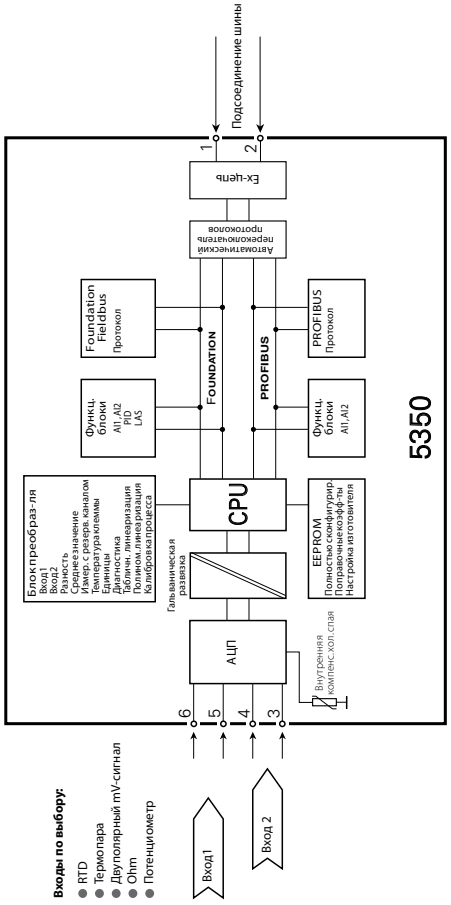


Монтаж кабеля датчика

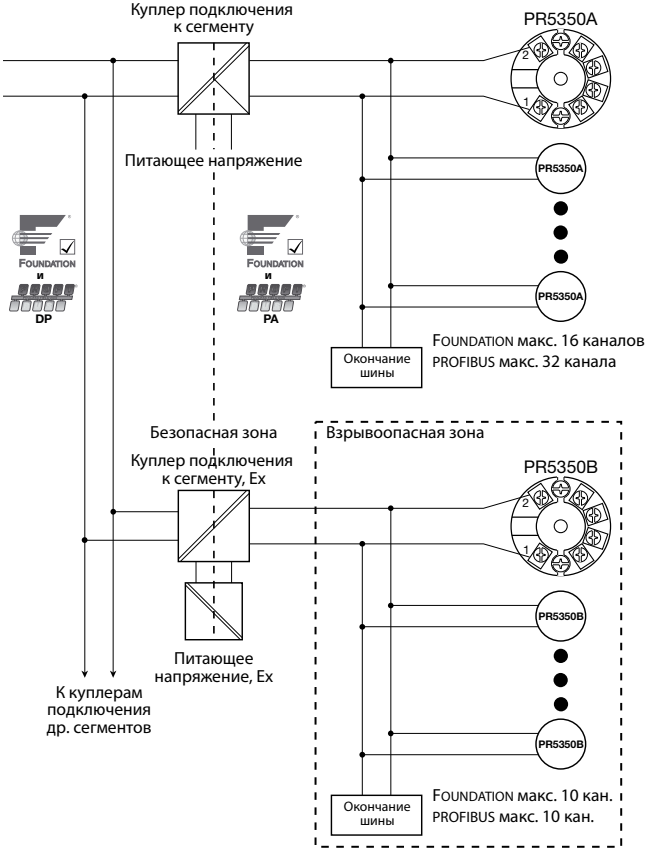


Провод монтируют между пластинами

ПРИНЦИПИАЛЬНАЯ СХЕМА



ПОДКЛЮЧЕНИЕ В ШИННОЙ СТРУКТУРЕ



ПРИЛОЖЕНИЕ

ATEX УСТАНОВОЧНАЯ СХЕМА - 5350A

ATEX УСТАНОВОЧНАЯ СХЕМА - 5350B

FM И CSA УСТАНОВОЧНАЯ СХЕМА № 5350QE01

INMETRO INSTRUÇÕES DE SEGURANÇA

NEPSI УСТАНОВОЧНАЯ СХЕМА

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

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

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, 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 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.

5350QE01
LERBAKKEN 10, 8410 RØNDE DENMARK. WWW.PRELECTRONICS.COM

ATEX Installation drawing

5350

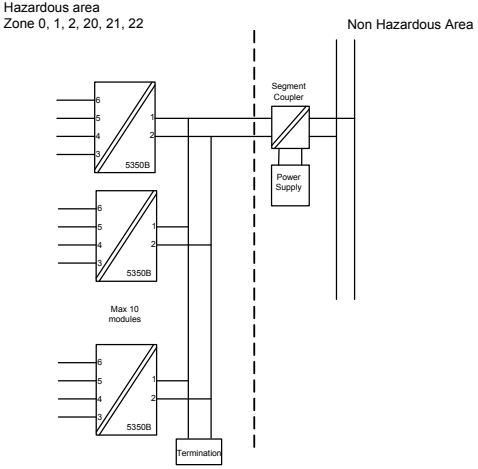
For safe installation of 5350B the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.
Year of manufacture can be taken from the first two digits in the serial 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	$T_{amb.}$ < 85°C	$T_{amb.}$ < 75°C	$T_{amb.}$ < 85°C	$T_{amb.}$ < 85°C	T1..T4	$T_{amb.}$ < 85°C	$T_{amb.}$ < 85°C
T5	$T_{amb.}$ < 70°C	$T_{amb.}$ < 65°C	$T_{amb.}$ < 60°C	$T_{amb.}$ < 60°C	T5	$T_{amb.}$ < 75°C	$T_{amb.}$ < 75°C
T6	$T_{amb.}$ < 60°C	$T_{amb.}$ < 45°C	$T_{amb.}$ < 45°C	$T_{amb.}$ < 45°C	T6	$T_{amb.}$ < 60°C	$T_{amb.}$ < 60°C

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 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:

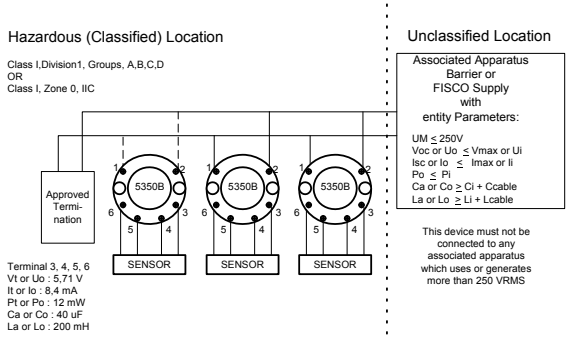
The transmitter shall be mounted in a metal enclosure form B according to DIN43729 that is providing a degree of protection of at least IP6X according to EN60529, that is suitable for the application and correctly installed.

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

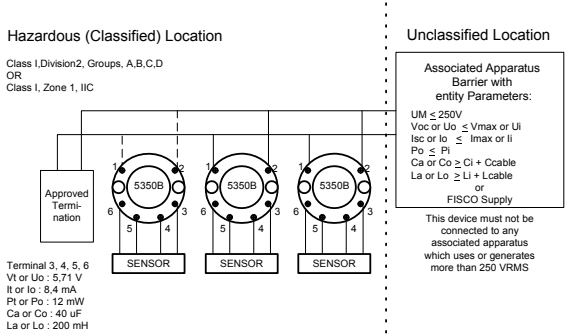
FM / CSA Installation drawing



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.

СОДЕРЖАНИЕ

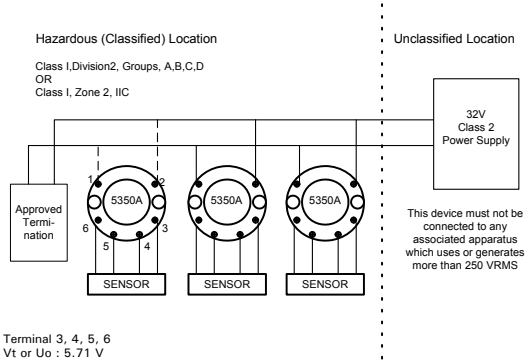


Entity Parameters		
Terminal 1, 2		
Class I, Zone 1, Ex ib IIC Entity / FISCO		
Barrier type:	Rectangular barrier	FISCO Segment coupler
T1..T4:	Ta ≤ +85°C	Ta ≤ +85°C
T5:	Ta ≤ +75°C	Ta ≤ +75°C
T6:	Ta ≤ +60°C	Ta ≤ +60°C
Vmax / Ui	30 V	17.5 V
Imax or Ii	250 mA	any
Pi	5.32 W	any
Ci	2.0 nF	2.0 nF
Li	1 µH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

See Installation notes.

Nonincendive Field Wiring parameters		
Terminal 1, 2		
NI, Class I, Division 2, Group A, B, C, D NIFW/ FNICO		
T1..T4:	Ta ≤ +85°C	Ta ≤ +85°C
T5:	Ta ≤ +75°C	Ta ≤ +75°C
T6:	Ta ≤ +60°C	Ta ≤ +60°C
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.



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.

INMETRO Instruções de Segurança.

Dados Ex: INMETRO 08/UL-BRCO-0019; BR-Ex ia IIC T4, T5, T6 ou BR-Ex ib [ia] IIC T4, T5, T6

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 , FISCO Temp. ambiente max. depende de Po da barreira conectada.					Sinal de saída / alimentação , terminal 1 e 2 Ex ib IIC T6 / T4 , FISCO Temp. ambiente max. depende de Po		
Unidade	**Barreira onde P_o < 0.85 W**	**Barreira onde P_o < 1.3 W**	**Adequado parasistemas FISCO**	**Adequado parasistemas FISCO**	**Unidade**	**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	Qualquer
P_i	0,84 W	1,3 W	2,0 W	5,32 W	P_i	5,32 W	Qualquer
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

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

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
Li	120mA	300mA	250mA	250mA
Pi	0.84W	1.3W	2.0W	5.32W

3.The max. inner capacitance and max. inner inductance of the transmitter are:

Ci=2nF Li=1 μ H

4. The transmitter in explosion protection system can only be applied in the explosive environment when it is combined with other Intrinsic safety 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. And this explosion protection system meets the requirements belows:

Uo≤Ui Io≤Ii Po≤Pi Co≥Cc+Ci Lo≥Lc+Li

Note: Cc, Lc are distributed electric capacity parameters of connection cable.
Uo, Io, Po are maximum output parameters of relative devices; Co, Lo are maximum internal parameters of relative devices.

5. The connection cable between the transmitter and the intrinsically safe port of the associated equipment is 3-wires electric-shielded cable with the insulating jacket. The sectional acreage of wire > 0.5mm2. Its electric-shield jacket is grounded in non-dangerous area and is insulated with the house of the transmitter, the cable should be out of the electromagnetic interference.

Индикаторы Программируемые дисплеи с большим выбором вводов и выводов для индикации температуры, объема, веса и т. д. Обеспечивают линеаризацию и масштабирование сигналов, имеют ряд измерительных функций, программируемых при помощи ПО PReset.

Ex-барьеры Интерфейсы для аналоговых и цифровых сигналов и сигналов HART® между датчиками / преобразователями I/P / сигналами частоты и СУ в опасных зонах Ex 0, 1 и 2, ряд модулей - в опасных зонах 20, 21 и 22.

Развязка Устройства гальванической развязки аналоговых и цифровых сигналов, а также сигналов в протоколе HART®. Обширная программа модулей с питанием от токовой петли или универсальным, для линеаризации, инвертирования и масштабирования выходных сигналов.

Температура Широкий выбор температурных преобразователей для монтажа в корпусе датчика стандарта DIN типа B и для установки на DIN-рейке, с обменом аналоговых и цифровых данных по шине. Предлагаются как под конкретные применения, так и универсальные.

Универсальность Программируемые с ПК или с панели мо-дули с универсальным рядом вводов, выводов и питания. Модули этого ряда имеют функции высокого порядка, напр. калибровка процесса, линеаризация и самодиагностика.

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