

PR



5350 Profibus PA / Foundation 2-х проводной программируемый преобразователь

Руководство по эксплуатации

Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Казань (843)206-01-48

Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81

Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54

Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

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.....	2
Области применения.....	3
Техническая характеристика	3
Монтаж / установка.....	3
Схемы применений	4
Расшифровка кода заказа: 5350	5
Электрические данные.....	5
Схемы присоединения	10
Установочные размеры	11
Монтаж кабеля датчика	11
Принципиальная схема.....	12
Подключение в шинной структуре.....	13
Приложение.....	15
ATEX Installation Drawing - 5350A	16
ATEX Installation Drawing - 5350B.....	17
FM / CSA Installation Drawing.....	19
INMETRO Instruções de Segurança	25
NEPSI Installation Drawing.....	26

ДЕКЛАРАЦИЯ СООТВЕТСТВИЯ ЕС

Изготовитель

PR electronics A/S

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/ЕС и последующих к ней дополнений

EN 61326-1 : 2006

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

Директивы АТЕХ 94/9/ЕС 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 Сер-

тификат АТЕХ: КЕМА 03АТЕХ1011 X (5350А)

Сертификат АТЕХ: КЕМА 02АТЕХ1318 (5350В)

Уполномоченный орган:

КЕМА Quality B.V. (0344)



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 температуры терморезистивным датчиком или термопарой.
- Измерение сопротивления, потенциометрическое и биполярного mV-сигнала.

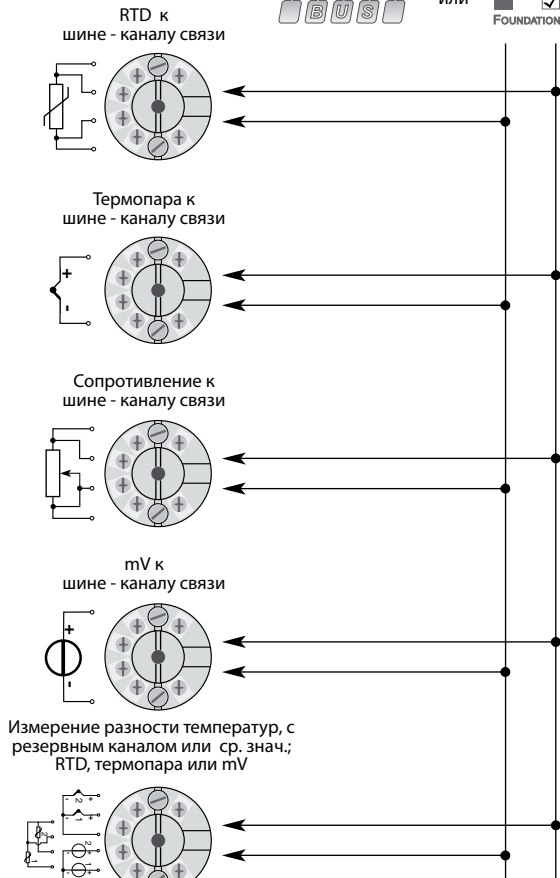
Техническая характеристика

- 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 В. 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 : A
	ATEX, FM и CSA : 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 показателя	≤ ±0,002% от показателя / °C

Базовые значения		
Типы входов	Основная-погрешность	Зависимость-от температуры
Pt100 и Pt1000	$\leq \pm 0,1^\circ\text{C}$	$\leq \pm 0,002^\circ\text{C} / ^\circ\text{C}$
Ni100	$\leq \pm 0,15^\circ\text{C}$	$\leq \pm 0,002^\circ\text{C} / ^\circ\text{C}$
Cu10	$\leq \pm 1,3^\circ\text{C}$	$\leq \pm 0,02^\circ\text{C} / ^\circ\text{C}$
Лин. R	$\leq \pm 0,05 \Omega$	$\leq \pm 0,002 \Omega / ^\circ\text{C}$
Напряжение	$\leq \pm 10 \mu\text{V}$	$\leq \pm 0,2 \mu\text{V} / ^\circ\text{C}$
Типы термопар: E, J, K, L, N, T, U	$\leq \pm 0,5^\circ\text{C}$	$\leq \pm 0,010^\circ\text{C} / ^\circ\text{C}$
Типы термопар: B, R, S, W3, W5	$\leq \pm 1^\circ\text{C}$	$\leq \pm 0,025^\circ\text{C} / ^\circ\text{C}$

Зависимость помехоустойчивости по ЭМС $< \pm 0,1\%$ от показателя
Улучшенная помехоустойчивость по ЭМС:
NAMUR NE 21, исп. импульсным напр. уровня A $< \pm 1\%$ от показателя

Устойчивость к вибрации (DIN класс B) IEC 60068-2-6 и IEC 60068-2-6a
4 г / 2...100 Hz
Отн. влажность воздуха $< 95\%$ (без конденсата)
Размеры $\varnothing 44 \times 20,2$ 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	$+850^\circ\text{C}$	IEC60751/JIS C 1604
Ni25...Ni1000	-60°C	$+250^\circ\text{C}$	IEC60751
Cu10...Cu1000	-50°C	$+200^\circ\text{C}$	$\alpha = 0,00427$
Лин. сопрот.	0Ω	$10 \text{ k}\Omega$	-
Потенциометр	0Ω	$100 \text{ k}\Omega$	-

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

Вход термопар:

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

Компенсация холодного спая (СЖС) $< \pm 0,5^\circ\text{C}$

Обнаружение сбоя датчика да

Ток обнаружения сбоя датчика:

в процессе обнаружения номинальный 4 μA
иначе 0 μA

Обнаружение КЗ $< 3 \text{ mV}$

Вход напряжения:

Диапазон измерения $-800...+800 \text{ mV}$
Входное сопротивление 10 М Ω

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 протокола FOUNDATION™ Fieldbus ... Констр. спецификации FF
Функц. возможности FOUNDATION™ Fieldbus.. LAS или Basic
Версия FOUNDATION™ Fieldbus ИТК 4.6
Блоки функций FOUNDATION™ Fieldbus 2 аналоговых и 1 PID

Сертификация по Ex - 5350A:

КЕМА 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:

КЕМА 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:

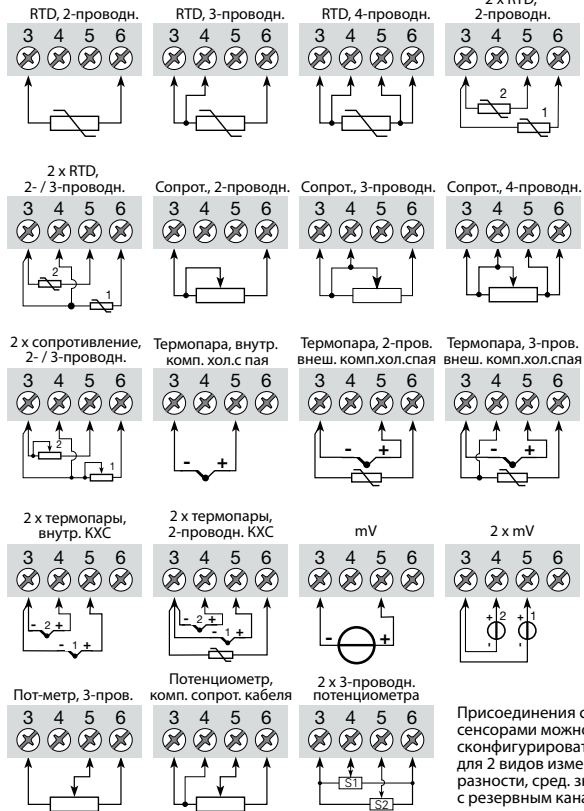
VNIIM и VNIIFTRI

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

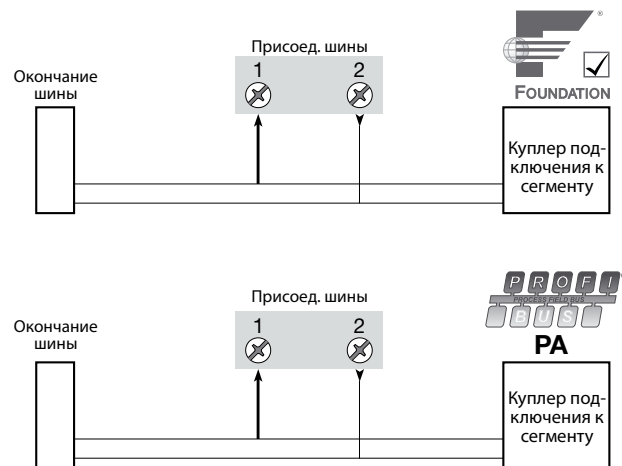
СХЕМЫ ПРИСОЕДИНЕНИЯ

Вход:

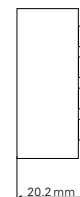
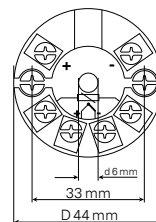


СХЕМЫ ПРИСОЕДИНЕНИЯ

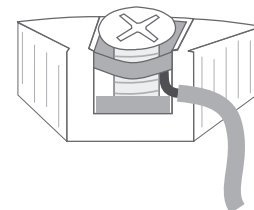
Выход:



Установочные размеры

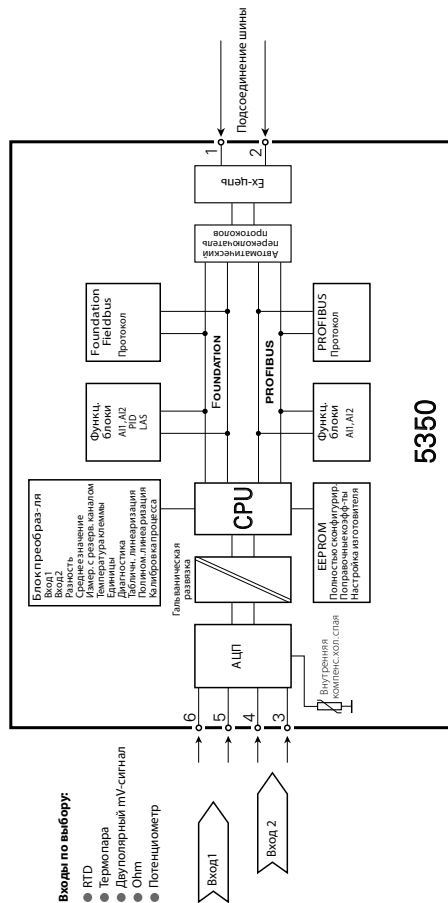


Монтаж кабеля датчика

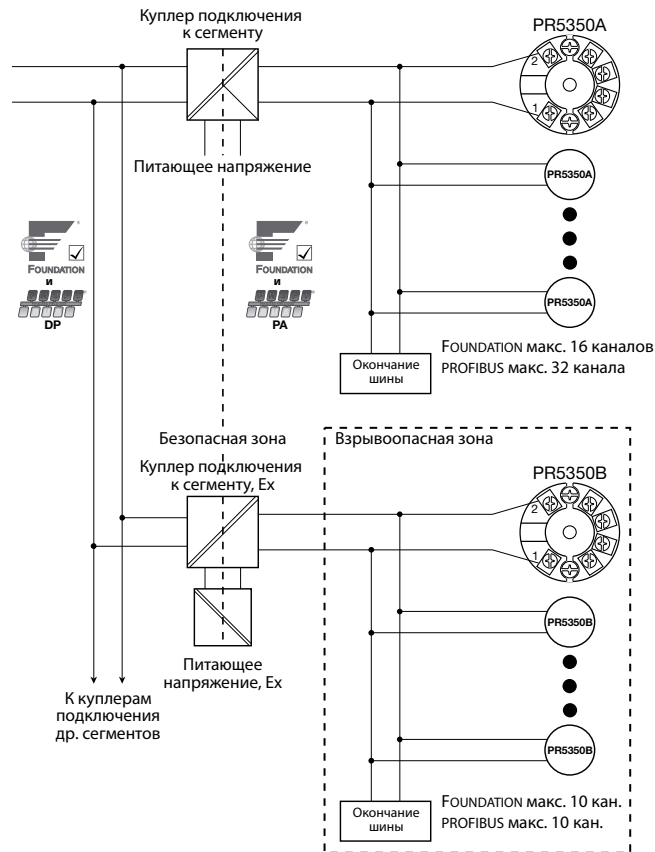


Провод монтируют между пластинами

ПРИНЦИПАЛЬНАЯ 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: $-40 \leq T_a \leq 85^\circ\text{C}$
T6: $-40 \leq T_a \leq 60^\circ\text{C}$

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

U_o: 5.7 V
I_o: 8.4 mA
P_o: 12 mW
L_o: 200 mH
C_o: 40 μF

Terminal: 1,2

Ex nA
U \leq 32 VDC

Terminal: 1,2

Ex nL or Ex ic
U_i = 32 VDC
L_i = 1 μH
C_i = 2.0 nF

Terminal: 1,2

FNICO
U_i = 17.5 VDC
L_i = 1 μH
C_i = 2.0 nF

Special conditions for safe use

For use in a potentially explosive atmosphere of flammable gases, 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 $\geq 60^\circ\text{C}$, 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



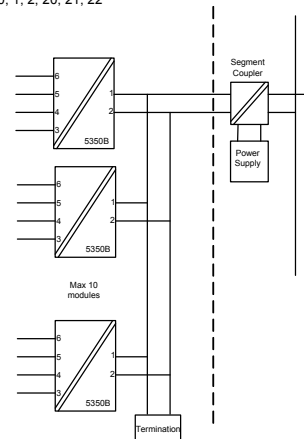
II 1 G Ex ia IIC T6..T4 or
II 2 (1) G Ex ib (ia) IIC T6..T4
II 1 D Ex iaD

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

Hazardous area
Zone 0, 1, 2, 20, 21, 22

Non Hazardous Area



Supply, terminal 1,2 for Ex ia IIC				Supply, terminal 1,2 for Ex ib IIC			
Unit	Barrier where P _e < 0.84 W	Barrier where P _e < 1.3 W	Suitable for FISCO systems	Suitable for FISCO systems	Unit	Barrier where P _e < 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 mAADC	300 mAADC	250 mAADC	900 mAADC	I _i	250 mAADC	any
P _e	0.84 W	1.3 W	2.0 W	5.32 W	P _e	5.32 W	any
L	1 µH	1 µH	1 µH	1 µH	L	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
 U_o : 5.7 VDC
 I_o : 8.4 mA
 P_o : 12 mW
 L_o : 200 mH
 C_o : 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.

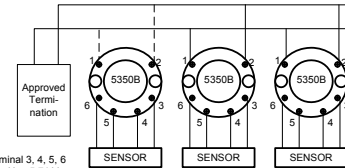
Cable entries and blanking elements shall be used that are suitable for the application and correctly installed.

For an ambient temperature ≥ 60°C, 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
Hazardous (Classified) Location

Class I, Division 1, Groups, A, B, C, D
 OR
 Class 1, Zone 0, IIC



Terminal 3, 4, 5, 6
 V_t or U_o : 5.71 V
 I_t or I_o : 8.4 mA
 P_t or P_o : 12 mW
 C_a or C_o : 40 µF
 L_a or L_o : 200 mH

Unclassified Location

Associated Apparatus
 Barrier or
 FISCO Supply
 with
 entity Parameters:

UM ≤ 250V
 V_{oc} or U_o ≤ V_{max} or U_i
 I_{sc} or I_o ≤ I_{max} or I_i
 P_o ≤ P_i
 C_a or C_o ≥ C_i + C_{cable}
 L_a or L_o ≥ L_i + L_{cable}

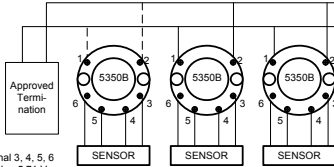
This device must not be
 connected to any
 associated apparatus
 which uses or generates
 more than 250 VRMS

Terminal 1,2				
Class 1, Zone 0, Ex ia IIC, Entity / FISCO				
IS, Class 1, 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:	T _a ≤ +85°C	T _a ≤ +75°C	T _a ≤ +65°C	T _a ≤ +60°C
T5:	T _a ≤ +70°C	T _a ≤ +65°C	T _a ≤ +60°C	T _a ≤ +60°C
T6:	T _a ≤ +60°C	T _a ≤ +45°C	T _a ≤ +45°C	T _a ≤ +45°C
V _{max} or U _i	30 V	30 V	17.5 V	15 V
I _{max} or I _i	120 mA	300 mA	250 mA	900 mA
P _i	0.84 W	1.3 W	2.0 W	5.32W
C _i	2.0 nF	2.0 nF	2.0 nF	2.0 nF
L _i	1 µH	1 µH	1 µH	1 µH

See Installation notes.

Hazardous (Classified) Location

Class I, Division 2, Groups, A, B, C, D
OR
Class I, Zone 1, IIC



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 μ F
La or Lo : 200 mH

Unclassified Location

Associated Apparatus
Barrier with
entity Parameters:

UM \leq 250V
Voc or Uo \leq Vmax or Ui
Isc or Io \leq Imax or Ii
Po \leq Pi
Ca or Co \geq Ci + Ccable
La or Lo \geq Li + Lcable
or
FISCO Supply

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

Entity Parameters		
Terminal 1, 2		
Class I, Zone 1, Ex ib IIC Entity / FISCO		
Barrier type:	Rectangular barrier	FISCO Segment coupler
T1..T4:	Ta \leq +85°C	Ta \leq +85°C
T5:	Ta \leq +75°C	Ta \leq +75°C
T6:	Ta \leq +60°C	Ta \leq +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 μ H	1 μ H

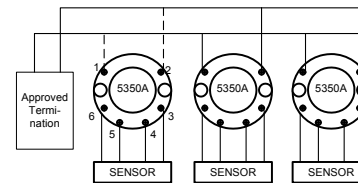
See Installation notes.

Nonincendive Field Wiring parameters		
Terminal 1, 2		
NI, Class I, Division 2, Group A, B, C, D NIFW/ FNICO		
T1..T4:	Ta \leq +85°C	Ta \leq +85°C
T5:	Ta \leq +75°C	Ta \leq +75°C
T6:	Ta \leq +60°C	Ta \leq +60°C
Vmax / Ui	30 V	17.5 V
Pi	5.32 W	any
Ci	2.0 nF	2.0 nF
Li	1 μ H	1 μ H

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.

Hazardous (Classified) Location

Class I, Division 2, Groups, A, B, C, D
OR
Class I, Zone 2, IIC

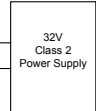


Terminal 3, 4, 5, 6
Vt or Uo : 5.71 V
It or Io : 8.4 mA
Pt or Po : 12 mW
Ca or Co : 40 μ F
La or Lo : 200 mH

Terminal 1.2
Ci : 2.0 nF
Li : 1 μ H

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

See installation notes:

Unclassified Location


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

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 U_i ($V_{i,max}$) and current I_i ($I_{i,max}$), and maximum power P_i ($P_{i,max}$), which the device can receive and remain intrinsically safe, must be equal to or greater than the voltage (U_o or V_{oc} or V_i) and current (I_o or I_{sc} or I_i) and the power P_o which can be delivered by the barrier.

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

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

The entity parameters U_o, V_{oc} or V_i and I_o, I_{sc} or I_i , and C_s and L_s 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 (V_{max}), the current (I_{max}) and the power (P_i) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (U_o, V_{oc}, V_t), the current (I_o, I_{sc}, I_t) and the power (P_o) which can be provided by the associated apparatus (supply unit). In addition, the maximum unprotected residual capacitance (C) and inductance (L) of each apparatus (other than the terminators) connected to the Fieldbus must be less than or equal to:

FISCO: 5 nF and 10 μ H.

FNICO: 5 nF and 20 μ H

The Nonincendive Field Wiring concept allows the interconnection of nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations.

$$V_{max} >= V_{oc} \text{ or } V_t, C_a >= C_i + C_{cable}, L_a >= L_i + L_{cable}$$

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: U_o or V_{oc} or $V_t <= V_{max}$, $P_o <= P_i$

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 (U_o, V_{oc}, V_t) 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 μ A 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

$C' = C' \text{ line/line} + 0.5 C' \text{ line/screen}$, if both lines are floating

or

$C' = C' \text{ line/line} + C' \text{ line/screen}$, 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 μ F.

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.

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

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.

$$V_{max} > = V_{oc} \text{ or } V_{t}, C_{a} > = C_{i} + C_{cable}, L_{a} > = L_{i} + L_{cable}''$$

Installation Notes For FISCO and Entry Concepts:

- The Intrinsic Safety Entry concept allows the interconnection of FM / UL / CSA-approved intrinsically safe devices (Div. 1 or Zone 0 or Zone1), with entry parameters not specifically examined in combination as a system when: U_{o} or V_{oc} or $V_{t} \leq V_{max}$, I_{o} or I_{sc} or $I_{t} \leq I_{max}$, $P_{o} \leq P_{i}$.
 C_{a} or $C_{o} \geq \Sigma C_{i} + \Sigma C_{cable}$, L_{a} or $L_{o} \geq \Sigma L_{i} + \Sigma L_{cable}$, $P_{o} \leq P_{i}$.
- 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:
 U_{o} or V_{oc} or $V_{t} \leq V_{max}$, I_{o} or I_{sc} or $I_{t} \leq I_{max}$, $P_{o} \leq P_{i}$.
- Control equipment connected to the Associated Apparatus must not use or generate more than 250 Vrms or Vdc.
- 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.
- The configuration of associated Apparatus must be FM Approvals or UL / CSA Approved under the associated concept.
- Associated Apparatus manufacturer's installation drawing must be followed when installing this equipment.
- 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".
- No revision to drawing without prior FM / UL / CSA Approval.
- Simple Apparatus is defined as a device that neither generates nor stores more than 1.5 V, 0.1 A or 25 mW.
- The termination must be NRTL-approved, and the resistor must be infallible.
- 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.
- Warning:**
Substitution of Components May Impair Safety.

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 isolamento galvânica total em relação ao circuito de entrada. Todavia a isolamento 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 $\geq 60^{\circ}\text{C}$, 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				Sinal de saída / alimentação, terminal 1 e 2 Ex ib IIC T6 / T4, FISCO			
Temp. ambiente max. depende de Po da barreira conectada.				Temp. ambiente max. depende de Po			
Unidade	Barreira onde $P_{e} < 0.85 \text{ W}$	Barreira onde $P_{e} < 1.3 \text{ W}$	Adequado parasistemas FISCO	Adequado parasistemas FISCO	Unidade	Barreira where $P_{e} < 5.32 \text{ W}$	FISCO segment coupler
U_{i}	30 VDC	30 VDC	17.5 VDC	15 VDC	U_{i}	30 VDC	17.5 VDC
I_{i}	120 mA DC	300 mA DC	250 mA DC	900 mA DC	I_{i}	250 mA DC	Quilquer
P_{i}	0.84 W	1.3 W	2.0 W	5.32 W	P_{i}	5.32 W	Quilquer
C_{i}	1 μH	1 μH	1 μH	1 μH	L_{i}	1 μH	1 μH
L_{i}	2 nF	2 nF	2 nF	2 nF	C_{i}	2 nF	2 nF
T1, T4	$T_{amb.} < 85^{\circ}\text{C}$	$T_{amb.} < 75^{\circ}\text{C}$	$T_{amb.} < 85^{\circ}\text{C}$	$T_{amb.} < 85^{\circ}\text{C}$	T1, T4	$T_{amb.} < 85^{\circ}\text{C}$	$T_{amb.} < 85^{\circ}\text{C}$
T5	$T_{amb.} < 70^{\circ}\text{C}$	$T_{amb.} < 65^{\circ}\text{C}$	$T_{amb.} < 60^{\circ}\text{C}$	$T_{amb.} < 60^{\circ}\text{C}$	T5	$T_{amb.} < 75^{\circ}\text{C}$	$T_{amb.} < 75^{\circ}\text{C}$
T6	$T_{amb.} < 60^{\circ}\text{C}$	$T_{amb.} < 45^{\circ}\text{C}$	$T_{amb.} < 45^{\circ}\text{C}$	$T_{amb.} < 45^{\circ}\text{C}$	T6	$T_{amb.} < 60^{\circ}\text{C}$	$T_{amb.} < 60^{\circ}\text{C}$

Entrada do sensor, terminais 3, 4, 5 e 6:

U_{o} : 5,7 VDC

I_{o} : 8,4 mA

P_{o} : 12 mW

Lo : 200 mH

Co : 40 μF

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 equipment 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) I I C T4-T6 while the Certificate No. is GYJ0091289U.

Firstly, Note for the use of the products

- 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.
- 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.
- 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

- the parameters of the transmitter output which will be connected with the inputs of the Sensor (X3, X4, X5, X6) are as follows:
 $U_0=5.7V$ $I_0=8.4V$ $P_0=12mW$ $C_0=40 \mu F$ $I_0=200 mH$
- 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.
 $U_0 < U_i$ $I_0 < I_i$ $P_0 \leq P_i$ $C_0 \leq C_i + C_i$ $L_0 \geq L_i + L_i$
 Note: C_c , L_c indicated the parameters of distributed electric capacity of connecting cable.
 U_i , I_i , P_i indicated the parameters of the output of other power-restraint devices; C_i , L_i indicated the maximum of the external parameter of the power-restraint devices.
- Users are not allowed to replace the inner electrical parts with permission.
- The installation, implementation and maintenance of the transmitter should strictly conform 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.

Transmitter 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:

- 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 than 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.
- 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) IIC	
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
U _i	30V	30V	17.5V	30V
I _i	120mA	300mA	250mA	250mA
P _i	0.84W	1.3W	2.0W	5.32W

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

$$C_i = 2nF \quad L_i = 1 \mu H$$

- 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:

$$U_0 \leq U_i \quad I_0 \leq I_i \quad P_0 \leq P_i \quad C_0 \geq C_c + C_i \quad L_0 \geq L_c + L_i$$

Note: C_c , L_c are distributed electric capacity parameters of connection cable.

U_0 , I_0 , P_0 are maximum output parameters of relative devices; C_0 , L_0 are maximum internal parameters of relative devices.

- 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.

По вопросам продажи и поддержки обращайтесь:

Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Казань (843)206-01-48

Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижегород (831)429-08-12
Новокузнецк (3843)20-46-81

Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54

Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

Единый адрес для всех регионов: pcn@nt-rt.ru || www.prelectronics.nt-rt.ru

