

PR[®]



6 3 3 1

**2-Wire Programmable
Transmitter**

No. 6331V105-IN
From ser. no. 079224041



SIGNALS THE BEST

- 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 modules for industrial automation. The product range includes Isolators, Displays, Ex Interfaces, Temperature Transmitters, and Universal Modules. 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 Signalverarbeitungsmodulen 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!

2-WIRE PROGRAMMABLE TRANSMITTER

PRetrans 6331

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EC DECLARATION OF CONFORMITY

As manufacturer

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

hereby declares that the following product:

**Type: 6331
Name: 2-Wire programmable transmitter**

is in conformity with the following directives and standards:

The EMC Directive 2004/108/EC and later amendments

EN 61326-1 : 2006

For specification of the acceptable EMC performance level, refer to the electrical specifications for the module.

The ATEX Directive 94/9/EC and later amendments

**EN 60079-0 : 2006, EN 60079-11 : 2007,
EN 60079-15 : 2005 and EN 60079-26 : 2007
ATEX certificate: KEMA 10ATEX0005 X (6331A)
ATEX certificate: KEMA 06ATEX0115 (6331B)**

Notified body

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

Rønde, 10 February 2010



Kim Rasmussen
Manufacturer's signature

2-WIRE PROGRAMMABLE TRANSMITTER PRetrans 6331

- *RTD, TC, Ohm, or mV input*
- *Extremely high measurement accuracy*
- *Galvanic isolation*
- *Programmable sensor error value*
- *1- or 2-channel version*

Application

- Linearised temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Conversion of linear resistance variation to a standard analogue current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.

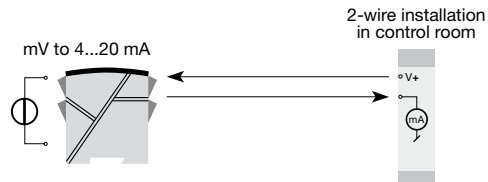
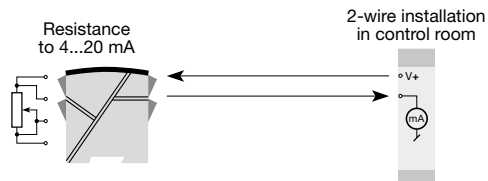
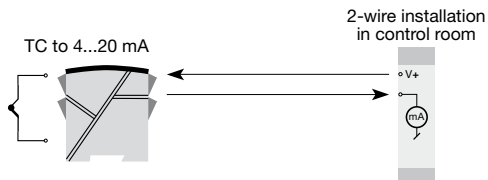
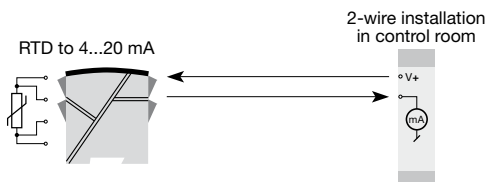
Technical characteristics

- Within a few seconds the user can program PR6331 to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- Continuous check of vital stored data for safety reasons.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version up to 84 channels per metre can be mounted.
- **NB:** As Ex barrier for 6331B we recommend 5401B, 5114B, or 5116B.

APPLICATIONS



Order: 6331

Type	Version	Galvanic isolation	Channels
6331	Standard : A ATEX Ex : B	1500 VAC : 2	Single : A Double : B

*NB! Please remember to order CJC connectors type 5910 / 5910Ex (channel 1) and 5913 / 5913Ex (channel 2) for TC inputs with an internal CJC.

Electrical specifications

Specifications range:

-40°C to +60°C

Common specifications:

Supply voltage, DC

Standard..... 7.2...35 V

ATEX Ex..... 7.2...30 VDC

Internal consumption 0.17...0.8 W

Voltage drop 7.2 VDC

Isolation voltage, test / operation 1.5 kVAC / 50 VAC

Isolation voltage, channel 1 / channel 2:

Standard..... 3.75 kVAC

ATEX Ex..... 1500 VAC

Warm-up time..... 5 min.

Communications interface Loop Link

Signal / noise ratio Min. 60 dB

Response time (programmable)..... 1...60 s

EEPROM error check < 3.5 s

Signal dynamics, input..... 20 bit

Signal dynamics, output..... 16 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 span	≤ ±0.01% of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
RTD	$\leq \pm 0.2^{\circ}\text{C}$	$\leq \pm 0.01^{\circ}\text{C}/^{\circ}\text{C}$
Lin. R	$\leq \pm 0.1 \Omega$	$\leq \pm 10 \text{ m}\Omega / ^{\circ}\text{C}$
Volt	$\leq \pm 10 \mu\text{V}$	$\leq \pm 1 \mu\text{V} / ^{\circ}\text{C}$
TC type: E, J, K, L, N, T, U	$\leq \pm 1^{\circ}\text{C}$	$\leq \pm 0.05^{\circ}\text{C} / ^{\circ}\text{C}$
TC type: B, R, S, W3, W5, LR	$\leq \pm 2^{\circ}\text{C}$	$\leq \pm 0.2^{\circ}\text{C} / ^{\circ}\text{C}$

EMC immunity influence	$< \pm 0.5\%$ of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	$< \pm 1\%$ of span

Effect of supply voltage variation.....	$< 0.005\%$ of span / VDC
Max. wire size.....	1 x 1.5 mm ² stranded wire
Humidity	$< 95\%$ RH (non-cond.)
Dimensions.....	109 x 23.5 x 104 mm
Protection degree.....	IP20
Weight (1 / 2 channels).....	145 / 185 g

Electrical specifications, input:

Max. offset.....	50% of selec. max. value
------------------	--------------------------

RTD and linear resistance input:

RTD type	Min. value	Max. value	Min. span	Standard
Pt100	-200°C	+850°C	25°C	IEC 60751
Ni100	-60°C	+250°C	25°C	DIN 43760
Lin. R	0 Ω	5000 Ω	30 Ω	-----

Cable resistance per wire (max.).....	5 Ω
Sensor current.....	Nom. 0.2 mA
Effect of sensor cable resistance (3- / 4-wire).....	$< 0.002 \Omega/\Omega$
Sensor error detection	Yes

TC input:

Type	Min. temperature	Max. temperature	Min. span	Standard
B	+400°C	+1820°C	100°C	IEC584
E	-100°C	+1000°C	50°C	IEC584
J	-100°C	+1200°C	50°C	IEC584
K	-180°C	+1372°C	50°C	IEC584
L	-100°C	+900°C	50°C	DIN 43710
N	-180°C	+1300°C	50°C	IEC584
R	-50°C	+1760°C	100°C	IEC584
S	-50°C	+1760°C	100°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	50°C	DIN 43710
W3	0°C	+2300°C	100°C	ASTM E988-90
W5	0°C	+2300°C	100°C	ASTM E988-90
LR	-200°C	+800°C	50°C	GOST 3044-84

Cold junction compensation < ±1.0°C

Sensor error detection Yes

Sensor error current:

When detecting Nom. 33 µA

Else 0 µA

Voltage input:

Measurement range -12...800 mV

Min. span 5 mV

Input resistance 10 MΩ

Output:**Current output:**

Signal range 4...20 mA

Min. signal range 16 mA

Updating time 440 ms

Output signal at EEPROM error ≤ 3.5 mA

Load resistance ≤ (V_{supply} - 7.2) / 0.023 [Ω]

Load stability < ±0.01% of span / 100 Ω

Sensor error detection:

Programmable 3.5...23 mA

Namur NE43 Upscale 23 mA


Namur NE43 Downscale 3.5 mA

Of span = Of the presently selected range

Ex approval - 6331A:

KEMA 10ATEX0005 X.....	II 3 G Ex nA [nL] IIC T4...T6 or II 3 G Ex nL IIC T4...T6 or II 3 G Ex nA [ic] IIC T4...T6 or II 3 G Ex ic IIC T4...T6
ATEX Installation Drawing No.....	6331QA02

Ex / I.S. approval - 6331B:

KEMA 06ATEX0115	 II 1 G Ex ia IIC T6...T5
Max. ambient temperature for T5	60°C
Max. ambient temperature for T6	40°C
ATEX, applicable in zone.....	0, 1, or 2
ATEX Installation Drawing No.	6331QA01

GOST R approval:

VNIIM & VNIIFTRI, Cert. no. See www.prelectronics.com

Observed authority requirements:

EMC 2004/108/EC

ATEX 94/9/EC.....

Standard:

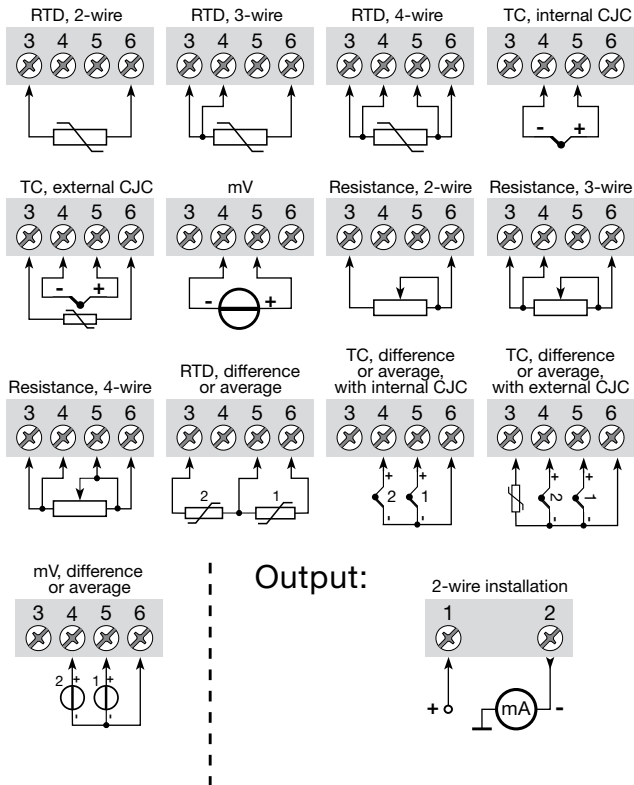
EN 61326-1

EN 60079-0, EN 60079-11,

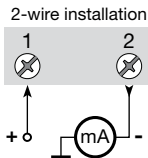
EN 60079-15, EN 60079-26

CONNECTIONS

Input:

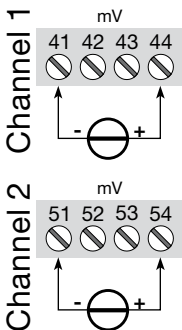


Output:

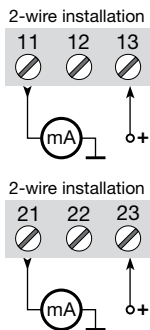


CONNECTIONS

Inputs:



Outputs:

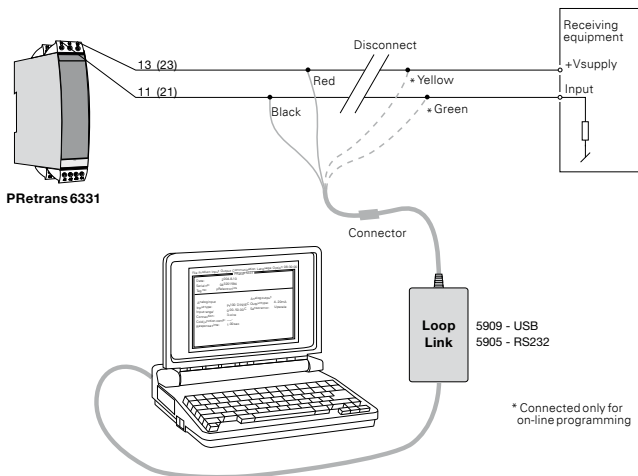


BLOCK DIAGRAM

PROGRAMMING

- Loop Link is a communications interface that is needed for programming PRetrans 6331.
- For programming please refer to the drawing below and the help functions in PReset.
- When communicating with non-installed modules, connectors 11, 12, 13 (channel 1) and 21, 22, 23 (channel 2) can be dismantled in the safe area to connect the terminals of the communications interface to the pins.
- Loop link is not approved for communication with modules installed in hazardous (Ex) areas

Order: Loop Link



APPENDIX

ATEX Installation Drawing - 6331A

ATEX Installation Drawing - 6331B

ATEX Installation drawing

For safe installation of 6331A or the 6334A the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

Year of manufacture can be taken from the first two digits in the serial number.

ATEX Certificate KEMA 10ATEX 0005X

Marking



II 3 G Ex nA [nL] IIC T6..T5
II 3 G Ex nL IIC T6..T5

II 3 G Ex nA [ic] IIC T6..T5
II 3 G Ex ic IIC T6..T5

Standards

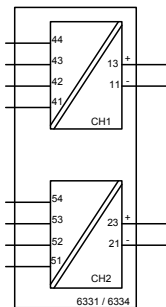
EN 60079-0 : 2006, EN 60079-11 : 2007, EN 60079-15 : 2005

T5: -40°C to 60 °C
T6: -40°C to 40 °C

Terminal:
41,42,43,44 /
51,52,53,54

Ex nA [nL]

U_o: 9.6 VDC
I_o: 25 mA
P_o: 60 mW
L_o: 33 mH
C_o: 2.4 µF



Hazardous Area Zone 2

Terminal:
11-13 / 21-23

Ex nA

U ≤ 35 VDC
I = 4 - 20 mA

Ex nL or Ex ic

U_i = 35 VDC
L_i = 10 µH
C_i = 1.0 nF

Special conditions for safe use.

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

ATEX Installation drawing


6331

For safe installation of 6331Bxx or 6334Bxx the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

Year of manufacture can be taken from the first two digits in the serial number.

ATEX Certificate KEMA 06ATEX 0115

Marking II 1 G Ex ia IIC T6..T5

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

Hazardous area
Zone 0, 1, 2

T5: $-40 \leq T_a \leq 60^\circ\text{C}$
T6: $-40 \leq T_a \leq 40^\circ\text{C}$

Terminal:
41,42,43,44

 U_o: 9.6 VDC

 I_o: 25 mA

 P_o: 60 mW

 L_o: 33 mH

 C_o: 2.4 μF
Terminal:
51,52,53,54

 U_o: 9.6 VDC

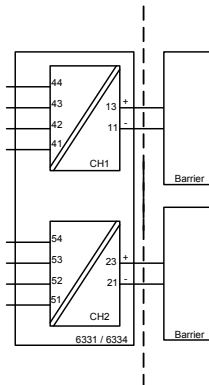
 I_o: 25 mA

 P_o: 60 mW

 L_o: 33 mH

 C_o: 2.4 μF

Non Hazardous Area


Terminal:
**11,13 and
21,23**

 U_i: 30 VDC

 I_i: 120 mA

 P_i: 0.84 W

 L_i: 10 μH

 C_i: 1.0 nF

Installation notes:

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



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 modules 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 modules with analogue and digital bus communication ranging from application-specific to universal transmitters.



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





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