2-WIRE PROGRAMMABLE TRANSMITTERS

5331D Features:

- RTD, Thermocouple, Ohm, or mV input
- Extremely high measurement accuracy
- 1.5 kVAC galvanic isolation
- Programmable sensor error value
- For DIN form B sensor head mounting

5333D Features:

- RTD or Ohm input
- High measurement accuracy
- 3-wire connection
- Programmable sensor error value
- For DIN form B sensor head mounting

5334B Features:

- Thermocouple input
- High measurement accuracy
- Galvanic isolation
- Programmable sensor error value
- For DIN form B sensor head mounting

Typical Applications:

- Linearised temperature measurement with Pt100 - Pt1000, Ni100 - Ni1000, or thermocouple 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 the transmitter 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.
- Cold junction compensation (CJC) with a built-in temperature sensor. (Transmitter 5334B)

Mounting and Installation:

- For DIN form B sensor head mounting
- NB: As Ex barrier we recommend 5104B, 5114B, or 5116B

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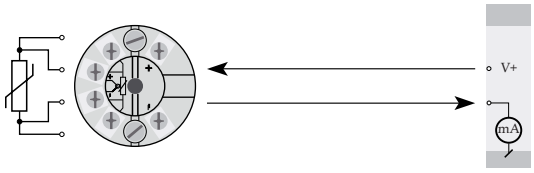
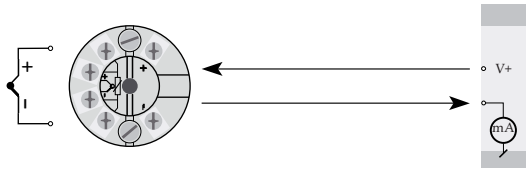
2-WIRE PROGRAMMABLE TRANSMITTERS

Transmitter 5331D

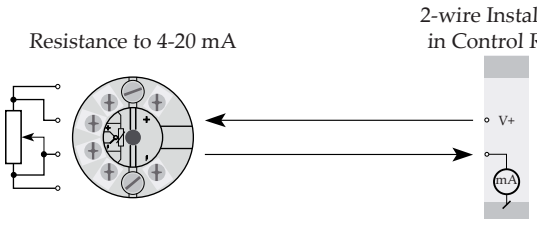
RTD to 4-20 mA



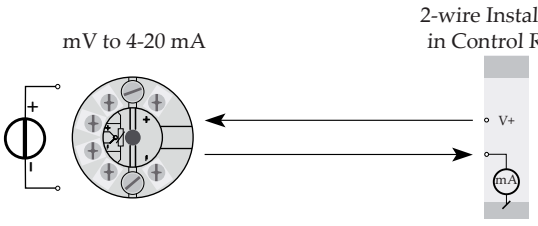
TC to 4-20 mA



Resistance to 4-20 mA

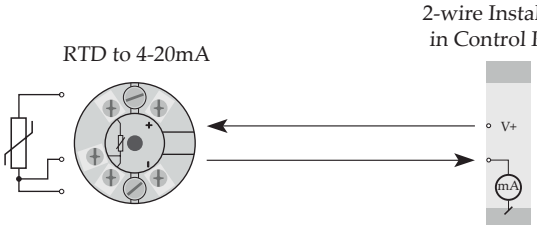


mV to 4-20 mA

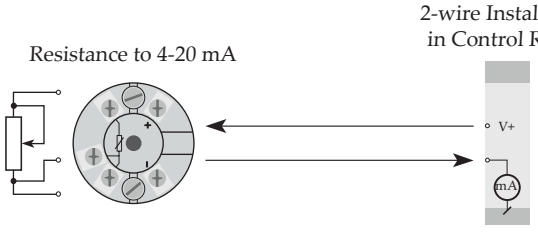


Transmitter 5333D

RTD to 4-20mA

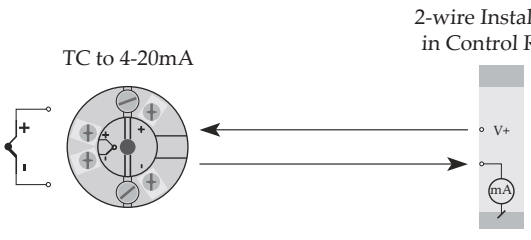


Resistance to 4-20 mA

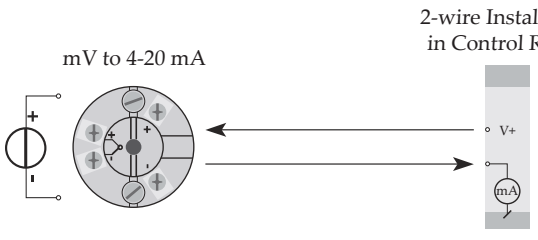


Transmitter 5334B

TC to 4-20mA



mV to 4-20 mA



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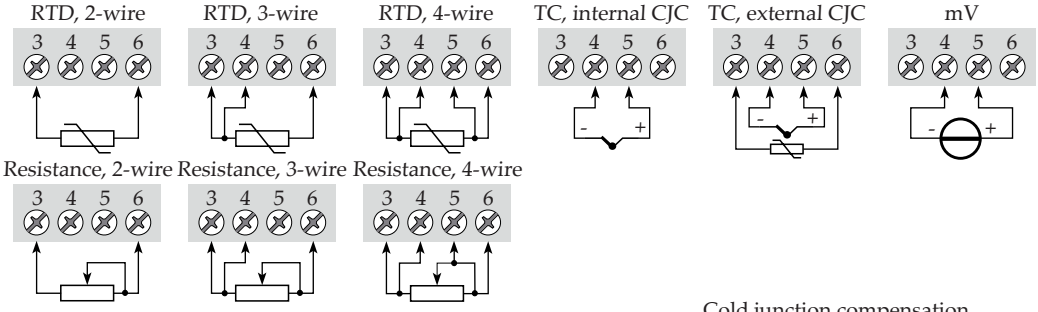
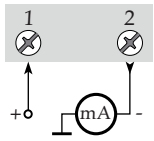
2-WIRE PROGRAMMABLE TRANSMITTER 5331D

Connections:

Input:



Output:



Electrical Specifications:

Specifications range:
-40°C to +85°C

Common Specifications:
Supply voltage, DC ..... 7.2 - 30 V
Voltage drop ..... 7.2 VDC
Isolation voltage, test/operation ..... 1.5 kVAC / 50 VAC
Communications interface ..... Loop Link
Signal/noise ratio ..... Minimum 60 dB
Signal dynamics, input ..... 20 bit
Signal dynamics, output ..... 16 bit
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	Absolute Accuracy	Temperature Coefficient
RTD	≤ ± 0.2°C	≤ ± 0.01% °C / °C
Lin. R	≤ ± 0.1 Ω	≤ ± 10 mΩ / °C
Volt	≤ ± 10 µV	≤ ± 1 µV / °C
TC Type: E, J, K, L, N, T, U	≤ ± 1°C	≤ ± 0.05°C / °C
TC Type: B, R, S, W3, W5, LR	≤ ± 2°C	≤ ± 0.2°C / °C

EMC immunity influence ..... < ± 0.5% of span
Extended EMC immunity:
NAMUR NE 21, A criterion, burst ..... < ± 1% of span

Vibration ..... IEC 60068-2-6 Test FC
Lloyd's specification no. 1 ..... 4 g / 2-100 Hz
Humidity ..... < 95% RH (non-cond.)
Dimensions ..... Ø 44 x 20.2 mm
Protection degree (encl. / terminal) ..... IP68 / IP00

Electrical specifications, input:
Max. offset ..... 50% of select. max. value

TC Input

Type	Min. Temp.	Max. Temp.	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

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

Voltage input:
Measurement range ..... -12 - 800 mV
Min. span ..... 5 mV

Current output:
Signal range ..... 4 - 20 mA
Min. signal range ..... 16 mA
Updating time ..... 440 ms
Load resistance ..... ≤ (Vsupply - 7.2) / 0.023 [Ω]

Sensor error detection:
Programmable ..... 3.5 - 23 mA

Ex / I.S. approval:
KEMA 06ATEX0062 ..... Ex II 1 G Ex ia IIC T4 or T6
II 1 D Ex ia D
Max. ambient temp. for T1-T4 ..... 85°C
Max. ambient temp. for T5 and T6 ..... 60°C
ATEX, applicable in zone ..... 0, 1, 2, 20, 21 or 22
ATEX Installation Drawing No. 5331QA01
FM, applicable in ..... IS, Class 1, Div. 1 Group A, B, C, D Ex ia IIC
IS, Class 1, Zone 0 AEx ia IIC
FM Installation Drawing No. 5300Q502
CSA, applicable in ..... IS, Class 1, Div. 1 Group A, B, C, D Ex ia IIC
IS, Class 1, Zone 0 AEx ia IIC
CSA Installation Drawing No. 533XQC03

Marine approval:
Det Norske Veriatas, Ships & Offshore. Stand. f. Certific. No. 2.4

GOST R approval:
VNIIM & VNIIFTRI, Cert. no. ..... www. prelectronics.com

Observed authority requirements:	Standard:
EMC 2004/108/EC	EN 61326-1
ATEX 94/9/EC	EN 60079-0, -11, -26 EN61241-0, -11
FM	3600, 3611, 3610
CSA, CAN / CSA	C22.2 No. 157, E60079-11, UL 913

Of span = Of the presently selected range

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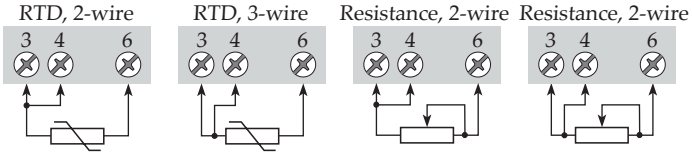
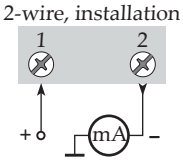
2-WIRE PROGRAMMABLE TRANSMITTER 5333D

Connections:

Input:



Output:



Electrical Specifications:

Specifications range:
-40°C to +85°C

Common Specifications:
Supply voltage, DC ..... 8.0 - 30 V
Internal consumption ..... 25 mW - 0.8 W
Voltage drop ..... 8 VDC
Warm-up time ..... 5 min.
Communications interface ..... Loop Link
Signal/noise ratio ..... Minimum 60 dB
Response time (programmable) ..... 0.33 - 60 sec.
Signal dynamics, input ..... 19 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	≤ ± 0.1% of span	≤ ± 0.01% of span / °C

Basic Values

Input Type	Absolute Accuracy	Temperature Coefficient
RTD	≤ ± 0.3°C	≤ ± 0.01% °C / °C
Lin. R	≤ ± 0.2 Ω	≤ ± 20 mΩ / °C

EMC immunity influence ..... < ± 0.5% of span

Effect of supply voltage variation ..... ≤ 0.005% of span / VDC
Vibration ..... IEC 60068-2-6 Test FC
Lloyd's specification no. 1 ..... 4 g / 2-100 Hz
Maximum wire size ..... 1 x 1.5 mm² stranded wire
Humidity ..... < 95% RH (non-cond.)
Dimensions ..... Ø 44 x 20.2 mm
Protection degree (encl. / terminal) ..... IP68 / IP00
Weight ..... 50 g

Electrical specifications, input:
Max. offset ..... 50% of select. 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	10,000 Ω	30 Ω	-----

Cable resistance per wire (max.) ..... 10 Ω
Sensor current ..... > 0.2 mA, < 0.4 mA
Effect of sensor cable resistance (3-wire) < 0.002 Ω / Ω
Sensor error detection ..... Yes

Output:
Current output:
Signal range ..... 4 - 20 mA
Min. signal range ..... 16 mA
Updating time ..... 135 ms
Load resistance ..... ≤ (Vsupply - 8) / 0.023 [Ω]

Sensor error detection:
Programmable ..... 3.5 - 23 mA
Namur NE43 Upscale ..... 23 mA
Namur NE43 Downscale ..... 3.5 mA

Ex / I.S. approval:
KEMA 03ATEX1535 X ..... Ⓔx II 1 GD, T80-105°C
EEx ia IIC T6 / T4
Max. ambient temp. for T1-T4 ..... 85°C
Max. ambient temp. for T5 and T6 ..... 60°C
ATEX, applicable in zone ..... 0, 1, 2, 20, 21 or 22

Ex / I.S. data:
Signal output / supply, terminal 1-2:
U_i ..... 30 VDC
I_i ..... 120 mADC
P_i ..... 0.84 W
L_i ..... 10 µH
C_i ..... 1.0 nF
Sensor input, terminal 3, 4 and 6:
U_o ..... 27 VDC
I_o ..... 7 mA
P_o ..... 45 mW
L_o ..... 34 mH
C_o ..... 90 nF

FM, applicable in ..... IS, Class 1, Div. 1
Group A, B, C, D
IS, Class 1, Zone 0
AEx ia IIC
FM Installation Drawing No. 5300Q502
CSA, applicable in ..... IS, Class 1, Div. 1
Group A, B, C, D
IS, Class 1, Zone 0
Ex ia IIC
CSA Installation Drawing No. 533XQC03

Marine approval:
Det Norske Veritas, Ships & Offshore.. Stand. for Certific. No. 2.4

GOST R approval:
VNIIM & VNIIFTRI, Cert. no. ..... www. prelectronics.com

Observed authority requirements:	**Standard:**
EMC 2004/108/EC	EN 61326-1
ATEX 94/9/EC	EN 50014, EN 50020 EN 50281-1-1, EN 50284, EN 61241-0, EN 61241-11
FM	3600, 3611, 3610
CSA, CAN / CSA	C22.2 No. 157, E60079-11, UL 913

Of span = Of the presently selected range

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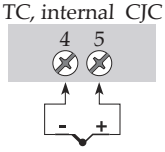
2-WIRE PROGRAMMABLE TRANSMITTER 5334B

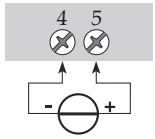
Connections:

Input:

TC, internal CJC

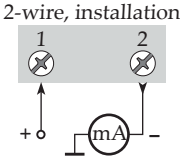


mV



Output:

2-wire, installation



Electrical Specifications:

Specifications range:
-40°C to +85°C

Common Specifications:
Supply voltage, DC ..... 7.2 - 28 V
Internal consumption ..... 25 mW - 0.8 W
Voltage drop ..... 7.2 VDC
Isolation voltage, test/operation ..... 1.5 kVAC / 50 VAC
Communications interface ..... Loop Link 5905A
Signal/noise ratio ..... Minimum 60 dB
Signal dynamics, input ..... 18 bit
Signal dynamics, output ..... 16 bit
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	Absolute Accuracy	Temperature Coefficient
Volt	≤ ± 10 µV	≤ ± 1 µV / °C
TC Type: E, J, K, L, N, T, U	≤ ± 1°C	≤ ± 0.05°C / °C
TC Type: B, R, S, W3, W5	≤ ± 2°C	≤ ± 0.2°C / °C

EMC immunity influence ..... < ± 0.5% of span
Extended EMC immunity:
NAMUR NE 21, A criterion, burst ..... < ± 1% of span

Effect of supply voltage variation ..... < 0.005% of span / VDC
Vibration ..... IEC 68-2-6 Test FC
Lloyd's specification no. 1 ..... 4 g / 2-100 Hz
Humidity ..... < 95% RH (non-cond.)
Dimensions ..... Ø 44 x 20.2 mm
Tightness (enclosure / terminal) ..... IP68 / IP00

Electrical specifications, input:
Max. offset ..... 50% of select. max. value

TC Input

Type	Min. Temp.	Max. Temp.	Min. Span	Standard
B	+400°C	+1820°C	200°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	100°C	IEC584
R	-50°C	+1760°C	200°C	IEC584
S	-50°C	+1760°C	200°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	75°C	DIN 43710
W3	0°C	+2300°C	200°C	ASTM E988-90
W5	0°C	+2300°C	200°C	ASTM E988-90

Cold junction compensation ..... < ± 1.0°C

Voltage input:
Measurement range ..... -12 - 150 mV
Min. span ..... 5 mV
Input resistance ..... 10 M Ω

Current output:
Signal range ..... 4 - 20 mA
Min. signal range ..... 16 mA
Updating time ..... 440 ms
Load resistance ..... ≤ (Vsupply - 7.2) / 0.023 [Ω]

Sensor error detection:
Programmable ..... 3.5 - 23 mA
NAMUR NE43 Upscale ..... 23 mA
NAMUR NE43 Downscale ..... 3.5 mA

Ex data:
U_i ..... 28 VDC
I_i ..... 120 mADC
P_i ..... 0.84 W
L_i ..... 10 µH
C_i ..... 1.0 nF

EEx / I.S. approval:
KEMA 03 ATEX 1536 ..... ⟨Ex⟩ II 1 G D
EEx is IIC T1-T6
Max. ambient temp. for T1-T4 ..... 85°C
Max. ambient temp. for T5 and T6 ..... 60°C
Applicable in zone ..... 0, 1, 2, 20, 21 or 22

Observed authority requirements: **Standard:**
EMC 89/336/EEC, Emission ..... EN 50 081-1, EN 50 0812-2
Immunity ..... EN 50 082-2, EN 50 082-1
Emission and Immunity ..... EN 61 326
ATEX 94/9/EC ..... EN 50 014, EN 50 0020, EN 50 281-1-1 and EN 50 284

Of span = Of the presently selected range

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