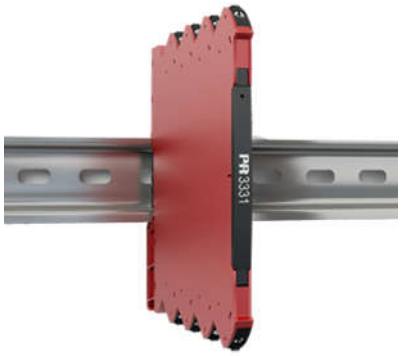
PERFORMANCE MADE SMARTER



Temperature converter, loop-powered - isolated

3331

– Excellent accuracy, better than 0.05% of span
– Slimline housing of 6 mm
– Excellent EMC performance and 50/60 Hz noise suppression
– Selectable < 30 ms / 300 ms response time
– Pre-calibrated temperature ranges selectable via DIP-switches

Application

- The 3331 temperature converter measures a standard Pt100, TC J and K temperature sensor, and provides an isolated passive analog current output signal.
- High 2 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3331 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

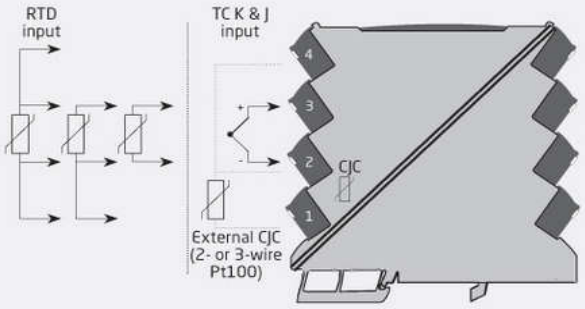
Technical characteristics

- Flexibly loop powered by 5.5...35 VDC via connectors.
- < 30 ms fast response time with simultaneous sensor error detection when selected.
- Selectable 300 ms response time when signal dampening is needed.
- Selectable internal/external CJC.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Meeting the NAMUR NE21 recommendations, the 3331 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- All terminals are protected against overvoltage and polarity error.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of > 60 dB.

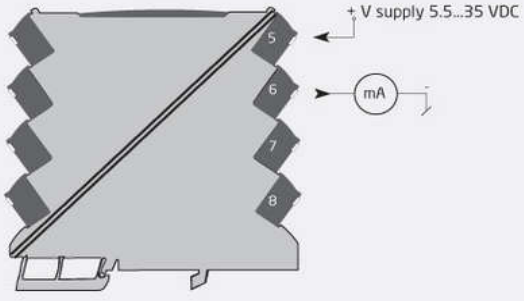
Mounting / installation / programming

- Selectable DIP-settings for easy configuration of more than 1000 factory calibrated measurement ranges.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C.

Applications



Safe Area or Zone 2 & Cl. 1, Div. 2, gr. A-D



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Order:

Type
3331

Environmental Conditions

Operating temperature	-25°C to +70°C
Storage temperature	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20
Installation in	Pollution degree 2 & meas. / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13...2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6
2...25 Hz	±1.6 mm
25...100 Hz	±4 g

Common specifications

Supply

Supply voltage	5.5...35 VDC
Max. required power	0.80 W
Internal power dissipation	19 mW...0.8 W

Isolation voltage

Isolation voltage, test / working	2.5 kVAC / 300 VAC (reinforced)
Zone 2 / Div. 2	250 VAC

Response time

Response time (0...90%, 100...10%)	< 30 ms / 300 ms (selectable)
Voltage drop	5.5 VDC
Signal / noise ratio	Min. 60 dB
Programming	DIP-switches
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE21, A criterion, burst	< ±1% of span
Incorrect DIP-switch setting identification	3.5 mA

Input specifications

RTD input

Temperature range, Pt100	-200...+850°C
Min. measurement range (span)	10°C
Accuracy: the greater of	Better than 0.05% of span or 0.1°C
Temperature coefficient: the greater of	0.02°C/°C or ≤ ±0.01%/°C
Sensor current	< 150 µA
Sensor cable resistance	< 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire)	< 0.002 Ω / Ω
Sensor error detection	Yes - selectable via DIP-switch
Broken sensor detection	> 800 Ω
Shorted sensor detection	< 18 Ω

TC input

Temperature range, TC J	-100...+1200°C
Temperature range, TC K	-180...+1372°C
Min. measurement range (span) - TC J & K	50°C
Accuracy: the greater of	Better than 0.05% of span or 0.5°C
Temperature coefficient: the greater of	0.1°C/°C or ≤ ±0.01%/°C
Sensor cable resistance	< 5 kΩ per wire
Cold junction compensation (CJC): Accuracy @ external Pt100 input	Better than ±0.15°C
Cold junction compensation (CJC): Accuracy @ internal CJC	Better than ±2.5°C
Internal CJC error detection	Yes
External CJC error detection	Yes - selectable via DIP-switch
Open Thermocouple detection	Yes - selectable via DIP-switch

Output specifications

Common output specifications

Updating time	10 ms

Current output

Programmable signal ranges	4...20 and 20...4 mA
Load (@ current output)	≤ (Vsupply - 5.5) / 0.023 [Ω]
Load stability	≤ 0.01% of span / 100 Ω
Sensor error indication	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF

I.S. / Ex marking

ATEX	II 3 G Ex nA IIC T4 Gc
IECEx	Ex nA IIC T4 Gc
FM, US	Cl. I, Div. 2, Gp. A, B, C, D T4 or Cl. I, Zone 2, AEx nA IIC T4
FM, CA	Cl. I, Div. 2, Gp. A, B, C, D T4 or Cl. I, Zone 2, Ex nA IIC T4

Observed authority requirements

EMC	2014/30/EU
LVD	2014/35/EU
RoHS	2011/65/EU
EAC	TR-CU 020/2011

Approvals

ATEX 2014/34/EU	KEMA 10ATEX0147 X
IECEx	KEM 10.0068X
FM	FM17US0004X / FM17CA0003X
DNV-GL Marine	Stand. f. Certific. No. 2.4
UL	UL 61010-1