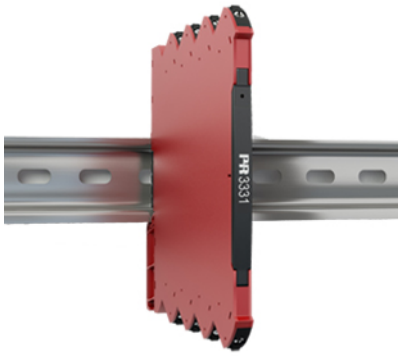
PERFORMANCE MADE SMARTER



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.

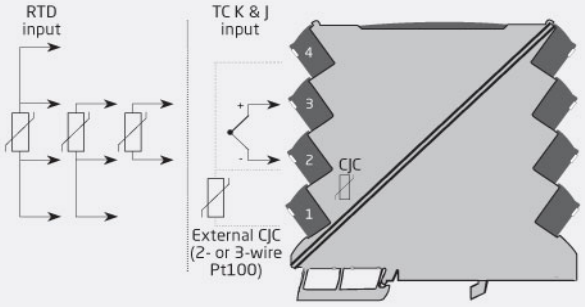
Technical characteristics

- 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.

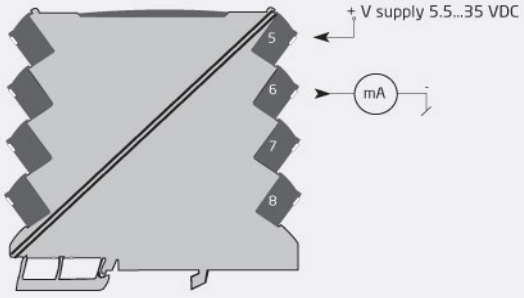
Mounting / installation / programming

- 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.

Connections



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



Order:

Type
3331

Environmental Conditions

Specifications range	-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 & measurement / 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 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	5.5...35 VDC
Voltage drop	5.5 VDC
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
Response time (0...90%, 100...10%)	< 30 ms / 300 ms (selectable)
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span
Incorrect DIP-switch setting identification	3.5 mA

Input specifications

Temperature range, Pt100	-200...+850°C
Accuracy, RTD: the greater of	Better than 0.05% of span or 0.1°C
Temperature coefficient, RTD: the greater of	0.02°C/°C or ≤ ±0.01%/°C
Sensor current, RTD	< 150 µA
Sensor cable resistance, RTD	< 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes - selectable via DIP-switch
Broken sensor detection	> 800 Ω
Shorted sensor detection	< 18 Ω
Temperature range, TC J	-100...+1200°C
Temperature range, TC K	-180...+1372°C
Accuracy, TC: the greater of	Better than 0.05% of span or 0.5°C
Temperature coefficient, TC: the greater of	0.1°C/°C or ≤ ±0.01%/°C
Sensor cable resistance, TC	< 5 kΩ per wire
Cold junction compensation (CJC): Accuracy @ external Pt100 intput	Better than ±0.15°C
Cold junction compensation (CJC): Accuracy @ internal CJC	Better than ±2.5°C
Open Thermocouple detection	Yes - selectable via DIP-switch
Internal CJC error detection	Yes
External CJC error detection	Yes - selectable via DIP-switch

Output specifications

Programmable current ranges	4...20 and 20...4 mA
Range limits	3.8...20.5 mA NAMUR NE43
Sensor error indication	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load resistance, current output	≤ (Vsupply - 5.5) / 0.023 [Ω]
Updating time	10 ms
Load stability, current output	≤0.01% of span / 100 Ω

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
UL	UL 61010-1