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.
Environmental Conditions
- Operating temperature: -25°C to +70°C
- Storage temperature: -40°C to +85°C
- Calibration temperature: 20°C to 28°C
- Relative humidity: < 95% RH (non-cond.)
- Protection degree: IP20
- Pollution degree: 2

Mechanical specifications
- Dimensions: 113 x 6.1 x 115 mm
- Weight: 70 g
- DIN rail type: DIN EN 60715/35 mm
- Wire size: 0.13 x 2.5 mm² / AWG 26...12 stranded wire
- Screw terminal torque: 0.5 Nm
- Vibration: 2...25 Hz ±1.6 mm
- 25...100 Hz ±4 mm

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
- Min. noise ratio: 60 dB
- Signal dynamics, input: 23 bit
- Signal dynamics, output: 16 bit
- EMC immunity influence: ≤ ±0.5% of span
- Extended EMC immunity: ≤ ±0.15% of span
- NE21: ≤ ±1% of span
- Incorrect DIP-switch setting: ≤ 3.5 mA

Input specifications
RTD input
- Temperature range, Pt100: -200...+850°C
- Min. measurement range (span): 10°C
- Accuracy: Better than 0.05% of span or 0.1°C
- Temperature coefficient: Better than 0.02°C/C or ≤ ±0.01%/°C
- Sensor current: < 150 µA
- Sensor cable resistance: < 50 Ω per wire
- 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

Output specifications
Common output specifications
- Updation time: 10 ms
- Current output: 4...20 and 20...4 mA
- Overload (at current output): ≤ (Vsupply - 5.5) / 0.023 [Ω]
- Load stability: ≤ 0.01% of span or 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

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
- IECEx:
- KEMA 10ATEX0147 X
- KEMA 10.0086X
- FM:
- FM17CA0003X
- FM17CA0003X
- DNV-GL Marine:
- Stand. Certific. No. 2.4
- UL:
- UL 61010-1

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 @ internal
- Pt100 input: Better than ±0.15°C
- Cold junction compensation: (CJC): Accuracy @ external
- Internal CJC error: ≤ ±2.5°C
- External CJC error detection: Yes - selectable via DIP-switch
- Open Thermocouple detection: Yes - selectable via DIP-switch

Environmental Conditions
- Temperature range, TC K: -25°C to +70°C
- Storage temperature: -40°C to +85°C
- Calibration temperature: 20°C to 28°C
- Relative humidity: < 95% RH (non-cond.)
- Protection degree: IP20
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- Sensor current: < 150 µA
- Sensor cable resistance: < 50 Ω per wire
- Effect of sensor cable resistance (3-4wire): < 0.002 Ω / Ω
- Sensor error detection: Yes - selectable via DIP-switch
- Broken sensor detection: > 800 Ω
- Shorted sensor detection: < 18 Ω

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