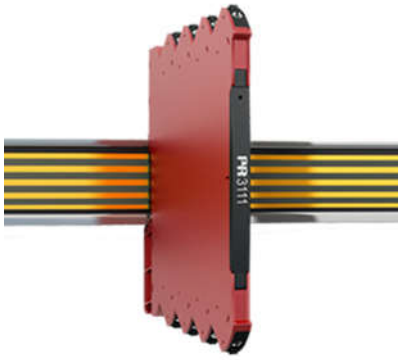
PERFORMANCE MADE SMARTER



TC converter - isolated

3111

– 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 are selectable via DIP-switches

Application

- The 3111 temperature converter measures standard TC J and K temperature sensors, and provides an isolated analog voltage or current output.
- High 3 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3111 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

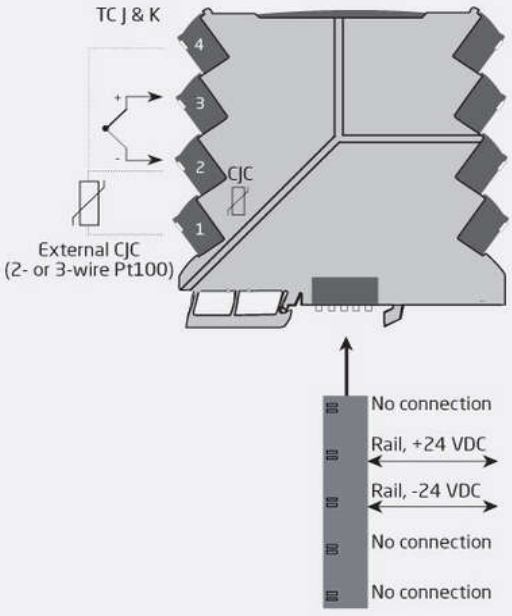
Technical characteristics

- Flexibly powered by 24 VDC (±30%) via power rail or 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 3111 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- A visible green LED indicates operational status of the unit and the input sensor.
- All terminals are protected against overvoltage and polarity error.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of > 60 dB.

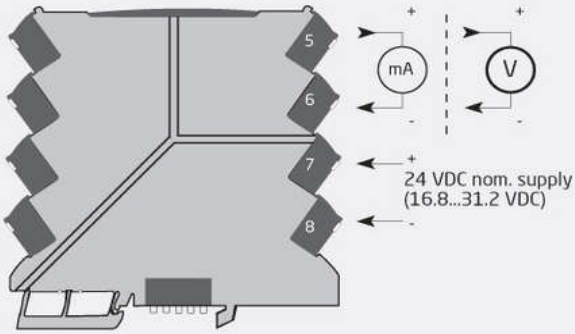
Mounting / installation / programming

- 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	Version	
3111	With power rail connector / terminals	:-
	Supplied via terminals	:-N

Example: 3111-N

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..... 16.8...31.2 VDC
Max. required power..... 0.70 W
Max. power dissipation..... 0.70 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)

Signal / noise ratio..... Min. 60 dB
Programming..... DIP-switches
Signal dynamics, input..... 23 bit
Signal dynamics, output..... 18 bit
Accuracy..... Better than 0.05% of selected range
EMC immunity influence..... < ±0.5% of span
Extended EMC immunity: NAMUR NE21, A criterion, burst..... < ±1% of span
Incorrect DIP-switch setting identification..... 0 V / 0 mA output; LED 0.5 s / 1 Hz

Input specifications

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

Signal range..... 0...23 mA
Programmable signal ranges..... 0 / 4...20 mA
Sensor error indication (0...20 mA)..... 0 mA or 23 mA / OFF
Sensor error indication (4...20 mA)..... 3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load (@ current output)..... ≤ 600 Ω
Load stability..... ≤ 0.01% of span / 100 Ω
Current limitation @ low output load..... < 60 mA peak / < 4 mA average

Voltage output

Programmable signal ranges..... 0/1...5 and 0/2...10 V
Sensor error indication..... 0 V / 10% above the max. / none

Open output..... < 18 V

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