

## 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.

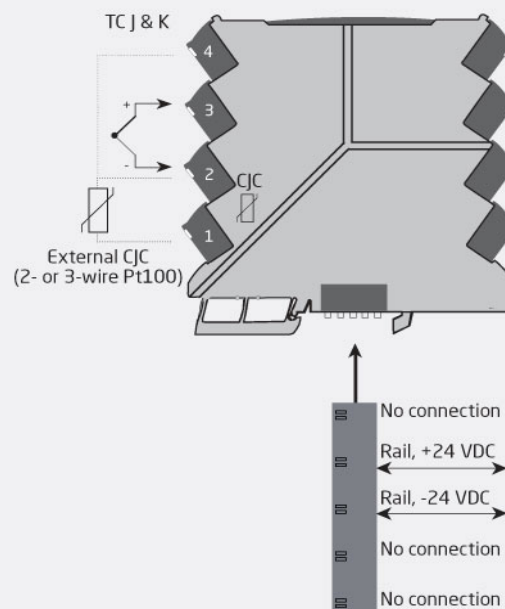
#### Technical characteristics

- Flexibly powered by 24 VDC ( $\pm 30\%$ ) 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.

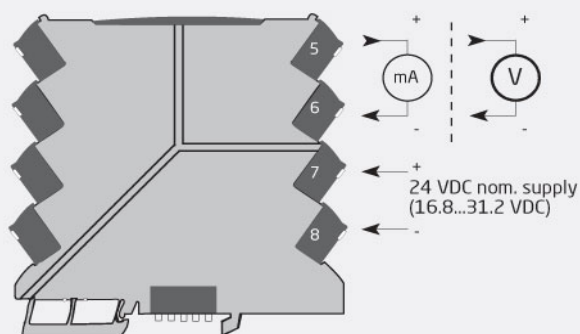
#### Mounting / installation / programming

- 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  $-25...+70^{\circ}\text{C}$ .

#### Connections



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



Order:

Type
3111

## 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 <sup>2</sup> / 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.....	16.8...31.2 VDC
Max. power consumption.....	0.7 W
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)
Accuracy.....	Better than 0.05% of selected range
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span
Incorrect DIP-switch setting identification.....	0 V / 0 mA output; LED 0.5 s / 1 Hz

## Input specifications

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 input.....	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.....	0 / 4...20 mA
Range limits (0...20 mA).....	0...20.5 mA
Sensor error indication (0...20 mA).....	0 mA or 23 mA / OFF
Range limits (4...20 mA).....	3.8...20.5 mA acc. to NAMUR NE43
Sensor error indication (4...20 mA).....	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load (@ current output).....	≤ 600 Ω (12.6 V / 21 mA)
Open output.....	< 18 V
Updating time.....	10 ms
Load stability, current output.....	≤ 0.01% of span / 100 Ω
Programmable voltage ranges.....	0/1...5 and 0/2...10 V
Low range.....	0/1...5 V
Limits, low range.....	0/0.875...5.125 V
High range.....	0/2...10 V
Limits, high range.....	0/1.75...10.25 V
Sensor error indication, voltage output.....	0 V / 10% above the max. / none
Load (@ voltage output).....	≥ 10 kΩ
Current limitation @ low output load.....	< 60 mA peak / < 4 mA average

## Approvals

EMC.....	EN 61326-1
LVD 2006/95/EC.....	EN 61010-1
ATEX 2004/108/EC.....	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEX.....	KEM 10.0068X
FM.....	3041043-C
DNV Marine.....	Stand. f. Certific. No. 2.4
GL.....	V1-7-2
CCOE.....	P337347/1
EAC TR-CU 020/2011.....	EN 61326-1
UL.....	UL 61010-1