



TC converter - isolated

3111

- Excellent accuracy, better than 0.05% of span
- Slimline housing of 6.1 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.

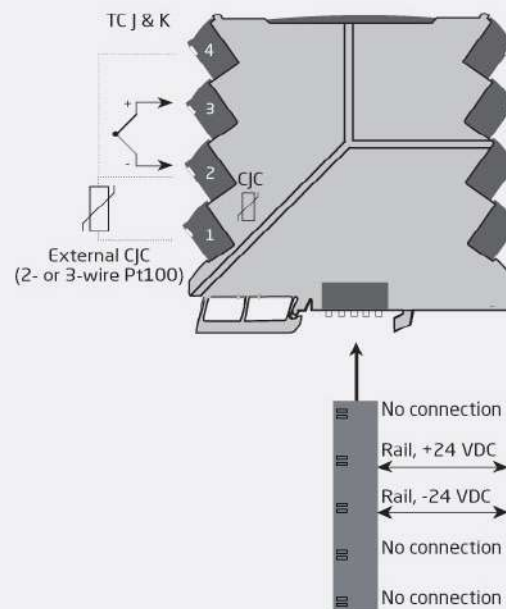
Technical characteristics

- 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.

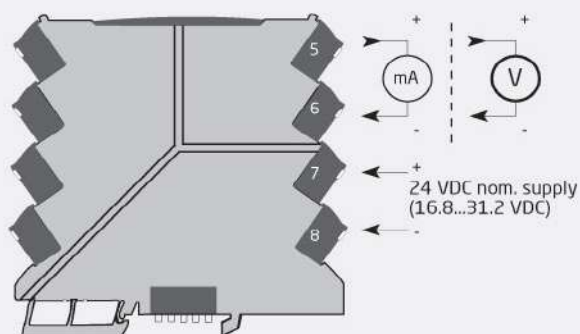
Mounting / installation / programming

- Selectable DIP-settings for easy configuration of more than 1000 factory calibrated measurement ranges.
- The narrow 6.1 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 $-25...+70^{\circ}\text{C}$.

Applications



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



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 $\pm 0.01\%/^{\circ}\text{C}$
Sensor cable resistance.....	< 5 k Ω per wire
Cold junction compensation (CJC): Accuracy @ external Pt100 input.....	Better than $\pm 0.15^{\circ}\text{C}$
Cold junction compensation (CJC): Accuracy @ internal CJC.....	Better than $\pm 2.5^{\circ}\text{C}$
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
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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).....	$\leq 600 \Omega$
Load stability.....	$\leq 0.01\%$ 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 ec IIC T4 Gc
IECEx.....	Ex ec 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
EAC Ex.....	2Ex nA IIC T4 Gc X

Observed authority requirements

EMC.....	2014/30/EU & UK SI 2016/1091
LVD.....	2014/35/EU & UK SI 2016/1101
ATEX.....	2014/34/EU & UK SI 2016/1107
RoHS.....	2011/65/EU & UK SI 2012/3032
ATEX.....	2014/34/EU
EAC.....	TR-CU 020/2011
EAC Ex.....	TR-CU 012/2011

Approvals

ATEX.....	KEMA 10ATEX0147 X
IECEX.....	KEM 10.0068X
UKEX.....	DEKRA 21UKEX0055X
c FM us.....	FM17US0004X / FM17CA0003X
c UL us, UL 61010-1.....	E314307
DNV Marine.....	TAA00001RW
EAC Ex.....	RU C-DK.HA65.B.00355/19