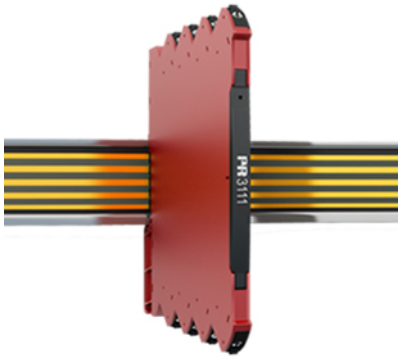
PERFORMANCE MADE SMARTER



TC converter - isolated

3111

- Excellent accuracy, better than 0.05% of span
- Excellent EMC performance and 50/60 Hz noise suppression
- Selectable < 30 ms / 300 ms response time
- Pre-calibrated temperature ranges selectable via DIP switches
- Slimline 6.1 mm housing

Technical highlights

- Temperature converter which measures standard TC J and K temperature sensors, and provides an isolated analog current or voltage output signal.
- High 3-port isolation provides surge suppression that protects the control system from transients and noise and eliminates ground loops.
- All terminals are over-voltage protected, polarity protected and short-circuit protected.
- The device can be mounted in Safe area or in Zone 2 / Division 2 areas and is approved for marine applications.

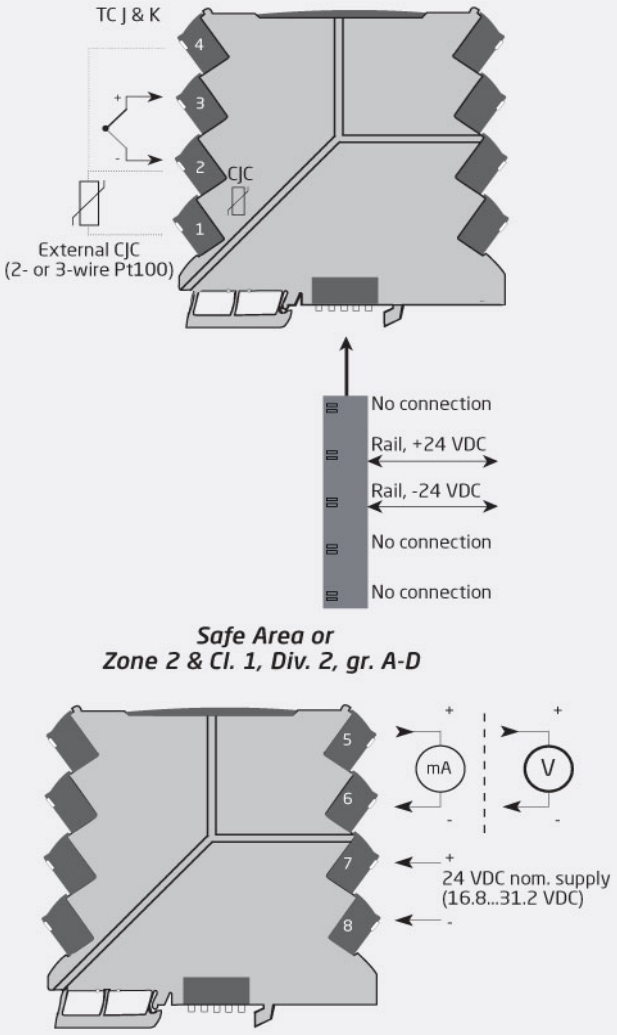
Programming

- Flexible 24 VDC (±30%) supply via power rail or connectors.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Selectable internal / external CJC.
- < 30 ms fast response time with simultaneous sensor error detection when selected.
- Selectable 300 ms response time when signal dampening is needed.
- Meeting the NAMUR NE21 recommendations, this device ensures top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- Excellent signal / noise ratio > 60 dB.
- High galvanic isolation of 2.5 kVAC.
- A green front LED indicates normal operation, status of the input sensor and malfunction.
- Wide ambient temperature range: -25...+70°C.

Mounting / installation

- Easy configuration via DIP switches.
- Selectable DIP settings for easy configuration of more than 1000 factory calibrated measurement ranges.

Applications



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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 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	EAEU KZ 7500361.01.01.08756