

## TC converter

### 3101

- Excellent accuracy, better than 0.1% 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



#### Functional highlights

- Temperature converter which measures standard TC J and K temperature sensors, and provides an analog current or voltage output signal.
- 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.

#### Technical highlights

- Flexible 24 VDC ( $\pm 30\%$ ) supply via connectors.
- Excellent conversion accuracy in all available ranges, better than 0.1% of span.
- < 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.
- A green front LED indicates normal operation, status of the input sensor and malfunction.
- Wide ambient temperature range:  $-25\dots+70^{\circ}\text{C}$ .

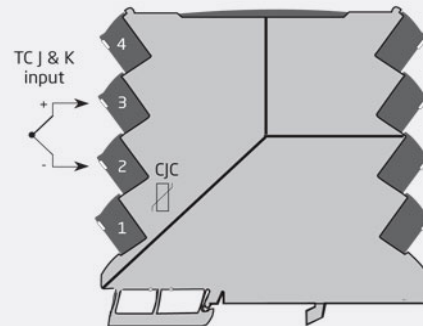
#### Programming

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

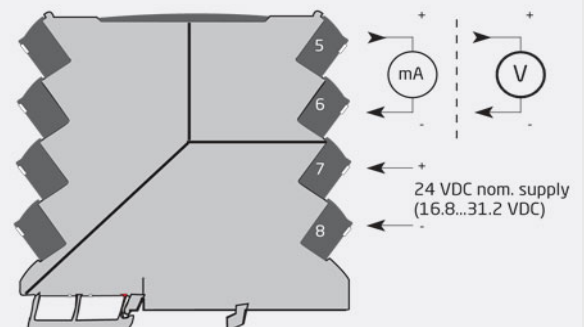
#### Mounting / installation

- The narrow 6.1 mm housing allows up to 163 units per meter.
- Units can be mounted side by side, horizontally and vertically, without air gap on a standard DIN rail, even at  $70^{\circ}\text{C}$  ambient temperature.

#### Applications



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



**Order:**

<b>Type</b>
3101

**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 <sup>2</sup> / 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.....	0.52 W
Max. power dissipation.....	0.52 W

**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 0.1% of sel. 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 0.1% of span or 1°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 CJC.....	Better than ±2.5°C
Internal CJC error detection.....	Yes
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).....	≤ 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
Load (@ voltage output).....	≥ 10 kΩ
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
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
EAC Ex.....	EAEU KZ 7500361.01.01.08756
DNV Marine.....	TAA00001RW