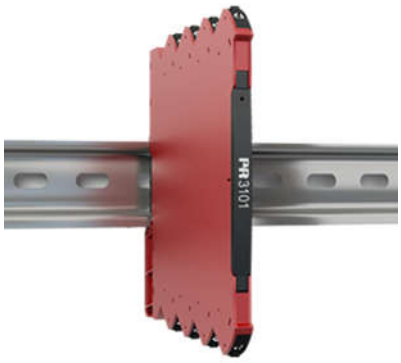
PERFORMANCE MADE SMARTER



TC converter

3101

- High accuracy, better than 0.1% 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 selectable via DIP-switches

Application

- The 3101 temperature converter measures standard TC J and K temperature sensors, and provides an analog voltage or current output.
- The 3101 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

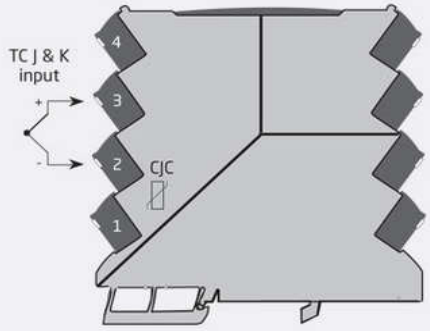
Technical characteristics

- Flexibly powered by 24 VDC (±30%) via connectors.
- < 30 ms fast response time with simultaneous sensor error detection when selected.
- Selectable 300 ms response time when signal dampening is needed.
- High conversion accuracy in all available ranges, better than 0.1% of span.
- Meeting the NAMUR NE21 recommendations, the 3101 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.
- Excellent signal/noise ratio of > 60 dB.

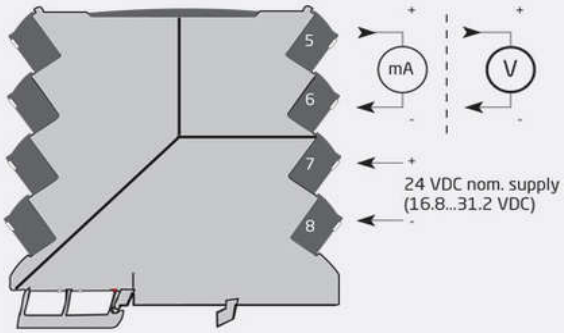
Mounting / installation / programming

- 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
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^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	0.52 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

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 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