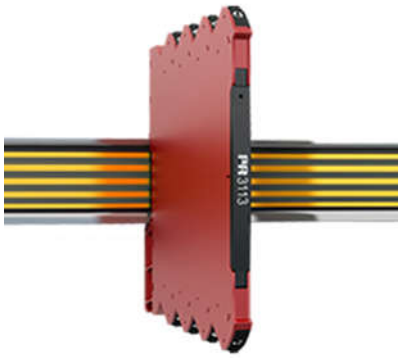
PERFORMANCE MADE SMARTER



HART 7 temperature converter - isolated

3113

– High accuracy, better than 0.05% of span
– Slimline housing of 6 mm
– Excellent EMC performance
– Selectable 60 ms / 60 s response time
– Pre-calibrated temperature ranges selectable via DIP-switches

Application

- The 3113 temperature converter measures a standard Pt100, TC J and K temperature sensor, and provides an isolated active analog current and HART signal output.
- High 3 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3113 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

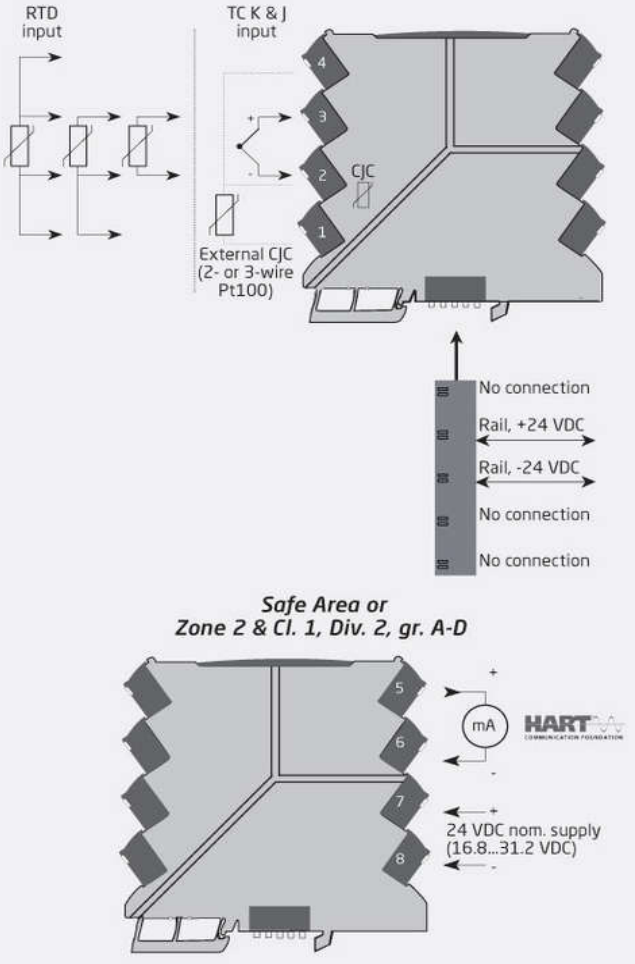
Technical characteristics

- Flexibly powered by 24 VDC (±30%) via power rail or connectors.
- A 60 ms fast response time with simultaneous sensor error detection when selected.
- Selectable internal/external CJC.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Meeting the NAMUR NE21 recommendations, the 3113 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 HART mode with HART 7 revision protocol enables extended device programming.
- Selectable DIP-mode for easy configuration of more than 1000 factory calibrated measurement ranges with HART read only feature.
- 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



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Order

Type	Version	
3113	With power rail connector / terminals	:-
	Supplied via terminals	:-N

Example: 3113-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

HART mode, (0...90%, 100...10%)..... 60 ms...60 s, programmable
DIP mode, (0...90%, 100...10%)..... < 60 ms

Accuracy..... Better than 0.05% of selected range
Signal / noise ratio..... Min. 60 dB
Long-term stability, better than..... ±0.1% of span / year (±0.3% of span / 5 years)
Programming..... DIP-switches
Signal dynamics, input..... 23 bit
Signal dynamics, output..... 18 bit
EMC immunity influence..... < ±0.5% of span
Extended EMC immunity: NAMUR NE21, A criterion, burst..... < ±1% of span
Incorrect DIP-switch setting identification..... 3.5 mA output; LED 0.5 s / 1 Hz

Input specifications

RTD input

Temperature range, Pt100..... -200...+850°C
Min. measurement range (span)..... 10°C
Accuracy: the greater of..... Better than 0.05% of span or 0.1°C
Temperature coefficient: the greater of..... 0.02°C/°C or ≤ ±0.01%/°C
Sensor current..... < 150 µA
Sensor cable resistance..... < 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire)..... < 0.002 Ω / Ω
Sensor error detection..... Yes - selectable via DIP-switch
Broken sensor detection..... > 800 Ω
Shorted sensor detection..... < 18 Ω

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..... 4...20 and 20...4 mA
Load (@ current output)..... ≤ 600 Ω
Load stability..... ≤ 0.01% of span / 100 Ω

Sensor error indication..... 3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Open output..... < 20 V
HART protocol revisions..... HART 7

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