HART temperature converter

3113

- HART® 7 revision protocol enables extended programming
- Slimline housing of 6 mm
- Excellent EMC performance
- 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 selected range input.
- 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.

Connections

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Environmental Conditions
Specifications range.......................................
-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...........................................
IP 20
Installation in..................................................
Pollution degree 2 & measurement / 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 x 2.5 mm² / AWG 26...12 stranded wire
Screw terminal torque.......................................
0.5 Nm

Common specifications
Supply voltage...............................................
16.8...31.2 VDC
Max. power consumption..................................0.7 W
Isolation voltage, test........................................2.5 kVAC (reinforced)
Isolation voltage, working..................................300 VAC/250 VAC (I.S.)
Signal / noise ratio..........................................> 60 dB
Response time, HART® mode.............................60 ms...60 s, programmable
Response time, DIP mode....................................< 60 ms
EMC immunity influence..................................< ±0.5% of sel. range
Extended EMC immunity: NAMUR NE 21, A criterion, burst..........< ±1% of sel. range
Incorrect DIP-switch setting identification..............3.5 mA

Input specifications
Temperature range...........................................
-200...+850°C
Accuracy, RTD..................................................Better than 0.05% of selected range or 0.1°C
Sensor current, RTD..........................................< 150 µA
Sensor cable resistance, RTD............................< 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire), RTD..........< 0.002 Ω / Ω
Sensor error detection, RTD..............................Yes - selectable via DIP-switch
Broken sensor detection..................................> 800 Ω
Shorted sensor detection..................................< 18 Ω
Temperature range, TC J....................................-100...+1200°C
Temperature range, TC K....................................-180...+1372°C
Accuracy, TC..................................................Better than 0.05% of selected range or 0.5°C
Sensor cable resistance, TC..............................< 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
Open Thermocouple detection............................Yes - selectable via DIP-switch
Internal CJC error detection.............................Yes
External CJC error detection............................Yes - selectable via DIP-switch

Output specifications
Programmable signal ranges............................4...20 and 20...4 mA
Range limits....................................................3.8...20.5 mA NAMUR NE 43
Sensor error indication....................................3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load (@ current output).....................................≤ 600 Ω (23 mA)
Load stability, current output.........................≤ 0.01% of span/100 Ω
HART® protocol revisions..............................HART® 7

Approvals
EMC.............................................................EN 61326-1
LVD.............................................................EN 61010-1
ATEX..........................................................KEMA 10ATEX0147 X
IECEx.........................................................KEM 10.0068X
FM..............................................................3041043-C
DNV Marine................................................Stand. f. Certific. No. 2.4
GL...............................................................V1-7-2
GOST R.........................................................Yes
UL...............................................................UL 61010-1