Endress+Hauser
People for Process Automation

Declaration of Conformity

Functional Safety according to IEC 61508:2010
Supplement 1 / NE130 Form B.1

Endress+Hauser Wetzer GmbH+Co. KG Obere Wank 1, 87484 Nesselwang

declares as manufacturer, that the following temperature transmitter

iTEMP TMT162

is suitable for the use in safety-instrumented systems up to SIL3 according to IEC61508:2010.

In safety instrumented systems according IEC 61508 and IEC 61511, the instructions of the Safety Manual have to be followed.

Nesselwang, 31.07.2019
Endress+Hauser Wetzer GmbH+Co. KG

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Director Operations

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General			
Device designation and permissible types	TMT162 (Order code for "Additional approval": Option LA "SIL")		
Safety-related output signal	4...20mA		
Fault current	≤ 3,6 mA oder ≥ 21,0 mA		
Process variable/function	Temperature, Voltage, Resistance		
Safety function(s)	min., max., range		
Device type acc. to IEC 61508-2	☐ Type A	☑ Type B	
Operating mode	☑ Low Demand Mode	☑ High Demand	☐ Continuous Mode
Valid Hardware-Version	04.01.00 or higher		
Valid Software-Version	04.01.zz or higher		
Safety manual	SD01632T/09/EN		
Type of evaluation (check only one box)	☑	Complete HW/SW evaluation parallel to development incl. FMEDA and change request acc. to IEC 61508-2, 3	
	☐	Evaluation of "Proven-in-use" performance for HW/SW incl. FMEDA and change request acc. to IEC 61508-2, 3	
	☐	Evaluation of HW/SW field data to verify „prior use" acc. to IEC 61511	
	☐	Evaluation by FMEDA acc. to IEC61508-2 for devices w/o software	
Evaluation through / certificate no.	TÜV SÜD Rail GmbH, Germany / certificate no. Z10 012833 0004 Rev.01		
Test documents	development documents, test reports, data sheets		

SIL - Integrity			
Systematic safety integrity		☐ SIL 2 capable	☑ SIL 3 capable
Hardware safety integrity	Single channel use (HFT = 0)	☑ SIL 2 capable	☐ SIL 3 capable
	Multi-channel use (HFT ≥ 1)	☐ SIL 2 capable	☑ SIL 3 capable

FMEDA	Transmitter
Safety function	min., max., range
λ_{DU} [1) 2)]	29 FIT
λ_{DD} [1) 2)]	269 FIT
λ_{SU} [1) 2)]	139 FIT
λ_{SD} [1) 2)]	0,2 FIT
SFF - Safe Failure Fraction	93%
PFD_{avg} T1 = 1 year [2)] (single channel architecture)	$1.3 \cdot 10^{-4}$
PFD_{avg} T1 = 5 years [2)] (single channel architecture)	$6.4 \cdot 10^{-4}$
PFH	$2.9 \cdot 10^{-8} \cdot 1/h$
PTC [3)]	96%
MTBF [4)]	142 years
Diagnostic test interval [5)]	4,3 min
Fault reaction time [6)]	< 16.2 s
Process safety time [7)]	7,2 h

Declaration	
☑	Our internal company quality management system ensures information on safety-related systematic faults which become evident in the future

[1)] FIT = Failure In Time, Number of failures per 10^9 h
[2)] Valid for average ambient temperature up to +40 °C (+104 °F)
For continuous operation at ambient temperature close to +60 °C (+140 °F), a factor of 2.1 should be applied
[3)] PTC = Proof Test Coverage
[4)] MTBF (Mean time between failures) is the predicted elapsed time between inherent failures of a system during operation in accordance to Siemens SN29500
[5)] All diagnostic functions are performed at least once within the Diagnostic test interval (26,1 min incl. memory test)
[6)] Maximum time between error recognition and error response
[7)] The Process safety time is: Diagnostic test interval x 100 (calculated acc. to IEC 61508)