Endress+Hauser
People for Process Automation

Declaration of Conformity

Functional Safety according to IEC 61508
Based on NE 130 Form B.1

Endress+Hauser SE+Co. KG, Hauptstraße 1, 79689 Maulburg

being the manufacturer, declares that the products

Deltabar S PMD75-ABA7BE1DCBE

Serial number: N405600109D
Serial number: N405610109D

is suitable for the use in safety-instrumented systems according to IEC 61508. The instructions of the corresponding functional safety manual must be followed.

This declaration of compliance is exclusively valid for the customer listed in the cover letter of the respective Endress+Hauser sales center and for the listed products and accessories in delivery status.

Maulburg, 5-September-2018
Endress+Hauser SE+Co. KG

i. V.

Dietmar Frühauf
Dept. Manager R&D Devices Level Limit

Endress+Hauser
People for Process Automation

General

Device designation and permissible types	PMD75-ABA7BE1DCBE		
	N405610109D; N405600109D		
Safety-related output signal	4...20 mA		
Fault signal	<=3.6mA; >=21mA		
Process variable/function	Pressure Measurement		
Safety function(s)	MIN, MAX, Range		
Device type acc. to IEC 61508-2	☐ Type A	☒ Type B	
Operating mode	☒ Low Demand Mode	☐ High Demand Mode	☐ Continuous Mode
Valid hardware version	As of version 02.00		
Valid software version	02.30.06 (failure E727 as alarm)		
Safety manual	SD00189P		
Type of evalulation (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 IEC 61508-2 for devices w/o software	
Evaluation through – report/certificate no.	TÜV SÜD Z10 16 09 20351 005		
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 (failure E727 as alarm)

Safety function	MIN	MAX	Range
λ_{DU} [1),2)]	69 FIT	69 FIT	69 FIT
λ_{DD} [1),2)]	396 FIT	52 FIT	0 FIT
λ_{SU} [1),2)]	440 FIT	440 FIT	440 FIT
λ_{SD} [1),2)]	52 FIT	396 FIT	448 FIT
SFF	92,8 %	92,8 %	92,8 %
PFD_{avg} (T_1 = 1 year) [2)] (single channel architecture)	$3{,}02 \times 10^{-4}$	$3{,}02 \times 10^{-4}$	$3{,}02 \times 10^{-4}$
PFD_{avg} (T_1 = 5 years) [2)] (single channel architecture)	$1{,}50\times 10^{-3}$	$1{,}50\times 10^{-3}$	$1{,}50\times 10^{-3}$
PFH	---	---	---
PTC [3)]	50 % / 99%	50 % / 99%	50 % / 99%
λ_{total} [1,2)]	1194 FIT	1194 FIT	1194 FIT
Diagnostic test interval [4)]	5 min	5 min	5 min
Fault reaction time [5)]	5 min	5 min	5 min

Comments

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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)] All diagnostic functions are performed at least once within the diagnostic test interval
[5)] Maximum time between error recognition and error response

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	Multi channel use (HFT ≥ 1)	☐ SIL 2 capable	☒ SIL 3 capable

FMEDA (failure E727 as warning)

Safety function	MIN	MAX	Range
λ_{DU} [1),2)]	76 FIT	76 FIT	76 FIT
λ_{DD} [1),2)]	347 FIT	50 FIT	0 FIT
λ_{SU} [1),2)]	427 FIT	427 FIT	427 FIT
λ_{SD} [1),2)]	50 FIT	347 FIT	397 FIT
SFF	91,0 %	91,0 %	91,0 %
PFD_{avg} (T_1 = 1 year) [2)] (single channel architecture)	$3{,}32 \times 10^{-4}$	$3{,}32 \times 10^{-4}$	$3{,}32 \times 10^{-4}$
PFD_{avg} (T_1 = 5 years) [2)] (single channel architecture)	$1{,}65 \times 10^{-3}$	$1{,}65 \times 10^{-3}$	$1{,}65 \times 10^{-3}$
PFH	---	---	---
PTC [3)]	50 % / 99%	50 % / 99%	50 % / 99%
λ_{total} [1,2)]	1136 FIT	1136 FIT	1136 FIT
Diagnostic test interval [4)]	5 min	5 min	5 min
Fault reaction time [5)]	5 min	5 min	5 min

Comments

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