

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 product

Gammapiilot FMG50

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, 13-Januar-2020
Endress+Hauser SE+Co. KG



i. V.
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Dept. Man. Technology
Quality Management / FSM
Research & Development

General			
Device designation and permissible types	Gammapilot FMG50		
	FMG50-*+LA		
Safety-related output signal	4...20 mA		
Fault signal	$\leq 3.6 \text{ mA}$; $\geq 21 \text{ mA}$		
Process variable/function	Level / Point Level / Interface / Density / Concentration Measurement		
Safety function(s)	MIN/MAX/RANGE		
Device type acc. to IEC 61508-2	<input type="checkbox"/> Type A	<input checked="" type="checkbox"/> Type B	
Operating mode	<input checked="" type="checkbox"/> Low Demand Mode	<input checked="" type="checkbox"/> High Demand Mode	<input checked="" type="checkbox"/> Continuous Mode
Valid hardware version	01.00.ww (ww: any double number)		
Valid software version	01.00.zz (zz: any double number)		
Safety manual	FY01007F		
Type of evaluation (check only <u>one</u> box)	<input checked="" type="checkbox"/>	Complete HW/SW evaluation parallel to development incl. FMEDA and change request acc. to IEC 61508-2, 3	
	<input type="checkbox"/>	Evaluation of "proven in use" performance for HW/SW incl. FMEDA and change request acc. to IEC 61508-2, 3	
	<input type="checkbox"/>	Evaluation of HW/SW field data to verify „prior use" acc. to IEC 61511	
	<input type="checkbox"/>	Evaluation by FMEDA acc. to IEC 61508-2 for devices w/o software	
Evaluation through – report/certificate no.	TÜV Rheinland – 968/FSP 1924.01/20		
Test documents	Development documents	Test reports	Data sheets
SIL - Integrity			
Systematic safety integrity		<input type="checkbox"/> SIL 2 capable	<input checked="" type="checkbox"/> SIL 3 capable
Hardware safety integrity	Single channel use (HFT = 0)	<input checked="" type="checkbox"/> SIL 2 capable	<input type="checkbox"/> SIL 3 capable
	Multi channel use (HFT ≥ 1)	<input type="checkbox"/> SIL 2 capable	<input checked="" type="checkbox"/> SIL 3 capable
FMEDA			
Safety function	MIN/MAX/RANGE		
$\lambda_{DU}^{1),2)}$	24 FIT		
$\lambda_{DD}^{1),2)}$	1581 FIT		
$\lambda_{SU}^{1),2)}$	478 FIT		
$\lambda_{SD}^{1),2)}$	2 FIT		
SFF	98 %		
PFD _{avg} (T ₁ = 1 year) ²⁾ (single channel architecture)	1.09×10^{-4}		
PFD _{avg} (T ₁ = 5 years) ²⁾ (single channel architecture)	$4,97 \times 10^{-4}$		
PFH	$2.38 \times 10^{-8} \text{ 1/h}$		
PTC ³⁾	Test Sequence A	91 %	
	Test Sequence B	77 %	
	Test Sequence C	89 %	
$\lambda_{total}^{1),2)}$	2085 FIT		
Diagnostic test interval ⁴⁾	<30 min		
Fault reaction time ⁵⁾	<5 s		
Comments			
The limit values for MIN/MAX must be defined by the user on a downstream logic unit (e.g. PLC) for the safety-related output signal.			
Declaration			
<input checked="" type="checkbox"/>	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 10⁹ 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