

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

Levelflex FMP50/51/52/53/54/55/56/57

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, July 20th, 2021
Endress+Hauser SE+Co. KG

i. V.



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General			
Device designation and permissible types ¹⁾	Guided level radar, Levelflex FMP5x-**y*****+LA x=0...7, y=A,B,C,K		
Safety-related output signal	4...20 mA		
Fault signal	≤ 3,6 mA ; ≥ 21 mA		
Process variable/function	Level or Interface 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 type="checkbox"/> Continuous Mode
Valid hardware version	As of manufacturing date after January 28, 2011		
Valid software version	As of version V01.01.ZZ		
Safety manual	FY01057F, FY01058F, FY01059F, FY01060F, FY01061F, FY01062F, FY01063F, FY01064F		
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 Industry Service GmbH - 968/EL 733		
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
$\lambda_{DU}^{2),3)}$	197 FIT	197 FIT	197 FIT
$\lambda_{DD}^{2),3)}$	2504 FIT	2504 FIT	2504 FIT
$\lambda_{SU}^{2),3)}$	801 FIT	801 FIT	801 FIT
$\lambda_{SD}^{2),3)}$	54 FIT	54 FIT	54 FIT
SFF	94 %	94 %	94 %
$PFD_{avg} (T_1 = 1 \text{ year})^3)$ (single channel architecture)	8.82×10^{-4}	8.82×10^{-4}	8.82×10^{-4}
$PFD_{avg} (T_1 = 3 \text{ years})^3)$ (single channel architecture)	2.61×10^{-3}	2.61×10^{-3}	2.61×10^{-3}
PFH	$1.97 \times 10^{-7} \text{ 1/h}$	$1.97 \times 10^{-7} \text{ 1/h}$	$1.97 \times 10^{-7} \text{ 1/h}$
PTC ⁴⁾	99 %	99 %	99 %
$\lambda_{total}^{2),3)}$	3556 FIT	3556 FIT	3556 FIT
Diagnostic test interval ⁵⁾	30 min	30 min	30 min
Fault reaction time ⁶⁾	30 s	30 s	30 s
Comments			
–			
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⁾ Valid order codes and order code exclusions are maintained in the E+H ordering system

²⁾ FIT = Failure In Time, number of failures per 10⁹ h

³⁾ 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

⁴⁾ PTC = Proof Test Coverage

⁵⁾ All diagnostic functions are performed at least once within the diagnostic test interval

⁶⁾ Maximum time between error recognition and error response