

## SIL Declaration of Conformity

Functional Safety according to IEC 61508  
Based on NE130 Form B.1

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

being the manufacturer, declares that the product stated below

**Micropilot S FMR530/532/533, FMR540**

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.

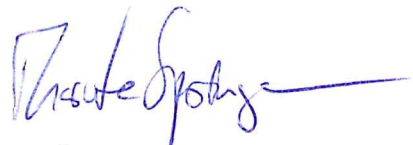
Maulburg, 13-July-2018  
Endress+Hauser SE+Co. KG

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General			
Device designation and permissible types	FMR530/532/533 FMR540		
Safety-related output signal	4...20 mA		
Fault current	$\leq 3.6 \text{ mA}$ ; $\geq 21 \text{ mA}$		
Process variable/function	Level measurement		
Safety function(s)	Min ; Max ; Range		
Device type acc. to IEC 61508-2	<input type="checkbox"/> Typ A <input checked="" type="checkbox"/> Typ 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 manufacturer date after June 30, 2018		
Valid Software-Version	As of version FMR530/532/533: V03.00.0074 and FMR540: V01.02.1332		
Safety manual	SD00345F		
Type of evaluation (check only <u>one</u> box)	<input type="checkbox"/> Complete HW/SW evaluation parallel to development incl. FMEDA and change request acc. to IEC 61508-2, 3 <input checked="" 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 IEC61508-2 for devices w/o software		
Evaluation through – report no.	Endress+Hauser SE+Co. KG / report no. 713_ASSESS_SIL-ZertVerl-FMR5xx		
Test documents	Development documents	Test reports	Data sheets
SIL - Integrity			
Systematic safety integrity		<input type="checkbox"/> SIL 2 capable	<input type="checkbox"/> SIL 3 capable
Hardware safety integrity	Single channel use (HFT = 0)	<input checked="" type="checkbox"/> SIL 1 capable	Low Demand Mode High Demand Mode
	Multi channel use (HFT $\geq 1$ )	<input checked="" type="checkbox"/> SIL 2 capable	Low Demand Mode
		<input type="checkbox"/> SIL 2 capable	<input type="checkbox"/> SIL 3 capable
FMEDA			
	FMR530/532/533	FMR540	
Safety function	Min ; Max ; Range	Min ; Max ; Range	
$\lambda_{DU}^{*1), 2)}$	374 FIT	318 FIT	
$\lambda_{DD}^{*1), (2)}$	663 FIT	1215 FIT	
$\lambda_{SU}^{*1), (2)}$	335 FIT	19 FIT	
$\lambda_{SD}^{*1), (2)}$	313 FIT	0 FIT	
SFF - Safe Failure Fraction	77,81 %	79,49 %	
PFDavg <sup>*2)</sup> (T = 1 year) (single channel architecture)	$1.64 \times 10^{-3}$	$1.40 \times 10^{-3}$	
PFDavg <sup>*2)</sup> (T = 2 years) (single channel architecture)	$3.28 \times 10^{-3}$	$2.80 \times 10^{-3}$	
PTC <sup>*3)</sup>	98 %	98 %	
$\lambda_{total}^{*1), (2)}$	1908 FIT	2285 FIT	
DC – Diagnostic Coverage	63 %	75 %	
Diagnostic test interval	30 min	30 min	
Fault reaction time	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) FIT = Failure In Time, Number of failures per  $10^9 \text{ h}$ \*2) Valid for average ambient temperature up to  $+40^\circ\text{C}$  ( $+104^\circ\text{F}$ )For continuous operation at ambient temperature close to  $+60^\circ\text{C}$  ( $+140^\circ\text{F}$ ), a factor of 2.1 should be applied

\*3) PTC = Proof Test Coverage