

## 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

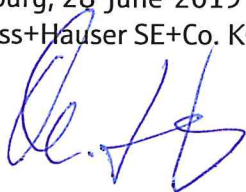
### Tankside Monitor NRF81

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, 28-June-2019  
Endress+Hauser SE+Co. KG

i. V.



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Dept. Man. R&D Quality Management/FSM  
Research & Development

General			
Device designation and permissible types	Tankside Monitor NRF8x - *****+LA x = 1		
Safety-related output signal <sup>a) b)</sup>	<sup>a)</sup> 4...20 mA	<sup>b)</sup> relay contact	
Fault signal <sup>a) b)</sup>	<sup>a)</sup> ≤ 3.6 mA ; ≥ 21 mA	<sup>b)</sup> open contact	
Process variable/function	Current in 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 Nov.28,2016		
Valid software version	As of 01.02.zz (zz: any double number)		
Safety manual	SD01929G		
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-report no. 968/FSP 1809.00/19		
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
$\lambda_{DU}^{1),2)}$	146 FIT	146 FIT	146 FIT
$\lambda_{DD}^{1),2)}$	5101 FIT	5101 FIT	5101 FIT
$\lambda_{SU}^{1),2)}$	2254 FIT	2254 FIT	2254 FIT
$\lambda_{SD}^{1),2)}$	0 FIT	0 FIT	0 FIT
SFF	98 %	98 %	98 %
$PFD_{avg} (T_1 = 1 \text{ year})^2)$ (single channel architecture)	$6.81 \times 10^{-4}$	$6.81 \times 10^{-4}$	$6.81 \times 10^{-4}$
$PFD_{avg} (T_1 = 2 \text{ years})^2)$ (single channel architecture)	$1.32 \times 10^{-3}$	$1.32 \times 10^{-3}$	$1.32 \times 10^{-3}$
PFH	$1.46 \times 10^{-7} \text{ 1/h}$	$1.46 \times 10^{-7} \text{ 1/h}$	$1.46 \times 10^{-7} \text{ 1/h}$
PTC <sup>3)</sup>	Depending on the proof test, see safety manual	Depending on the proof test, see safety manual	Depending on the proof test, see safety manual
$\lambda_{total}^{1),2)}$	7501 FIT	7501 FIT	7501 FIT
Diagnostic test interval <sup>4)</sup>	60 min	60 min	60 min
Fault reaction time <sup>5)</sup>	1 min	1 min	1 min
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		

<sup>1)</sup> FIT = Failure In Time, number of failures per 10<sup>9</sup> h

<sup>2)</sup> 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

<sup>3)</sup> PTC = Proof Test Coverage

<sup>4)</sup> All diagnostic functions are performed at least once within the diagnostic test interval

<sup>5)</sup> Maximum time between error recognition and error response