

Declaration of Conformity

Functional Safety according to IEC 61508:2010
Supplement 1 / NE130 Form B.1

KROHNE Pressure Solutions GmbH, Gewerbepark Meißen 14, 32423 Minden, Germany

declares as manufacturer, that the following device is

OPTIBAR 5060 Series

suitable for the use of safety-instrumented systems up to SIL 2/3 according to IEC 61508:2010.

In safety instrumented systems according IEC 61508 and IEC 61511, the instructions of the Safety Manual have to be followed.

Minden, 20.10.2020
KROHNE Pressure Solutions GmbH



Horstmann, Anja-Christina
Managing Director
KROHNE Pressure Solutions GmbH

Manufacturer			
Manufacturer	KROHNE Pressure Solutions GmbH		
Address	Gewerbepark 14, D-32423 Minden, Germany		
General			
Device designation and permissible types	OPTIBAR 5060 Series: Two-wire 4...20mA/HART with SIL qualification VGK*****A Slave sensor with SIL qualification VGK*****T		
Safety-related output signal	4...20mA		
Fault current	≥ 21mA; ≤ 3,6mA		
Process variable/function	Pressure transmitter for process pressure or hydrostatic level measurement. In addition with slave sensor for differential pressure measurements.		
Safety function(s)	Generation of a measured value to monitor 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	HW ≥ 1.0.0		
Valid Software-Version	SW ≥ 1.0.0		
Safety manual	AD_OPTIBAR_5060_Safety_Manual		
Type of evaluation (check only one 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 "prior 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.	TUV Rheinland Industry Service GmbH, No.: 968/FSP 1122.00/15		
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			
	OPTIBAR 5060 Series	OPTIBAR 5060 Series with OPTIBAR DS diaphragm seal	
Safety function	Min / Max / Range	Min / Max / Range	
$\lambda_{DU}^{*1)}$	44 FIT	75 FIT	
$\lambda_{DD}^{*1)}$	1223 FIT	1088 FIT	
$\lambda_{SU}^{*1)}$	0 FIT	0 FIT	
$\lambda_{SD}^{*1)}$	0 FIT	0 FIT	
SFF - Safe Failure Fraction	> 90%	> 90%	
PTC ^{*2)}	Test 1: 52% Test 2: 95% with pressure reference	Test 1: 29% Test 2: 97% with pressure reference	
FMEDA data source	SN 29500		
FMEDA			
	Electronic differential pressure consisting of two OPTIBAR 5060	Electronic differential pressure consisting of two OPTIBAR 5060 & OPTIBAR DS diaphragm seal	Electronic differential pressure consisting of two OPTIBAR 5060 & OPTIBAR DS diaphragm seal each
Safety function	Min / Max / Range	Min / Max / Range	Min / Max / Range
$\lambda_{DU}^{*1)}$	63 FIT	96 FIT	127 FIT
$\lambda_{DD}^{*1)}$	1508 FIT	1372 FIT	1237 FIT
$\lambda_{SU}^{*1)}$	0 FIT	0 FIT	0 FIT
$\lambda_{SD}^{*1)}$	0 FIT	0 FIT	0 FIT
SFF - Safe Failure Fraction	> 90%	> 90%	> 90%
PTC ^{*2)}	Test 1: 37% Test 2: 95% with pressure reference	Test 1: 24% Test 2: 97% with pressure reference	Test 1: 17% Test 2: 97% with pressure reference
FMEDA data source	SN 29500		
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 breakdown per 10⁹ h

*2) PTC: Proof Test Coverage (Diagnostic coverage for manual proof tests)