

FUNCTIONAL SAFETY CERTIFICATE

This certifies, that the company

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68307 Mannheim
Germany

Manufacturing plant: **Pepperl + Fuchs (Mfg) Pte Ltd**
18 Ayer Rajah Crescent
Singapore 139942
Singapore

Description of product: **KCD2-SCD-Ex1.ES(.SP), HiC2031ES**
(Details see Annex 1) **Smart Current Repeater**
(AO isolated barrier)

Tested in accordance with: **EN 61508:2010 Parts 1-7: SIL 3**

Registration No. 20 19716
Test Report No. PS-19716-19-L-01
File reference 19716-01



Certification Body
TÜV NORD Italia s.r.l

TÜV NORD Italia s.r.l - Via F.Turati 70 - 20023 Cerro Maggiore (MI) - Italy



Validity
from 2020-06-08
until 2025-06-08

Cerro Maggiore (MI), 2020-06-08

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Please also pay attention to the information stated overleaf

ANNEX

Annex 1, page 1 of 2

to Certificate Registration No. 20 19716

Product description:	Single channel Smart Current Repeater KCD2-SCD-Ex1.ES(.SP): 24 Vdc DIN Rail Mounting (housing 12,5 mm) HiC2031ES: Plug-in in HiC Termination Board (housing 12,5 mm)	
Type designation:	KCD2-SCD-Ex1.ES(.SP): HiC2031ES:	
Technical data:	Power supply to the isolated barriers:	19 V DC – 30 V DC
	<i>Input to Output:</i>	isolated current repeater 4 to 20 mA, 650 Ω max load
	Ambient Temperature:	-40 °C to 70 °C
	Storage Temperature:	-40 °C to 90 °C
	Max. Safety Level:	EN 61508:2010 Parts 1-7: SIL 3

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ANNEX

Annex 1, page 2 of 2

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The given values are only valid for an ambient temperature of 40 °C. Hints regarding the calculation of values at ambient temperatures > 40 °C are given in the safety manual.		
Safety related data (ambient temperature 40 °C)	Function	
	Analogue output	
Device type	-	A
Demand mode	-	Low or High demand mode
Total failure rate (only safety function)	FIT	185
Total failure rate (whole device)	FIT	739
MTBF	years	154
Fail safe detected (SD)	FIT	0
Fail safe undetected (SU)	FIT	0
Fail dangerous detected (DD)	FIT	177
Fail dangerous undetected (DU)	FIT	8.2
No effect	FIT	514
No part	FIT	41.2
PFD _{avg} (Tproof = 1 year)	-	4.25 x 10 ⁻⁵
PFD _{avg} (Tproof = 2 years)	-	7.78 x 10 ⁻⁵
PFD _{avg} (Tproof = 5 years)	-	1.84 x 10 ⁻⁴
PFD _{avg} (Tproof = 10 years)	-	3.60 x 10 ⁻⁴
PFH	1/h	8.20 x 10 ⁻⁹
SFF	-	95.60 %
HFT	-	0 (1oo1D)
SIL	-	3
SC	-	3

Safety related data:

Notes for safe use:

1. The validity of the assessment is only given for the hardware versions: PCB version 355-0296B for KCD2-SCD-Ex1.ES(.SP) and PCB version 355-0297 for HiC2031ES, as specified inside the technical report PS-19716-19-L-01 Rev. 0
2. For a complete functional safety assessment of a safety function, all requirements of EN 61508 have to be applied to the complete safety function in which the isolated barrier is used and the safety manual has to receive attention.

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