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on the examination of an independent flame detector device according to DIN EN 298 and DIN EN 61508

Date: 2015-04-20

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Test Laboratory	TÜV SÜD Industrie Service GmbH Abteilung Feuerungs- und Wärmetechnik Prüfbereich Sicherheits-, Kontroll- und Regeleinrichtungen
Subject of Test	Type **F130I**
Ordering Company	LAMTEC Leipzig GmbH & Co. KG D-04425 Taucha
Product description	Independent flame detector device with UV flame sensor, or with visible light flame sensor, or with ionisation flame sensor
Basis of Test	DIN EN 61508:2011-02 parts 1-7, DIN EN 298:2012-11
Test Reports	no. C-F 1528-00/15 dated 2015-04-20

The document consists of 2 pages

The test results refer exclusively to the units under test.

The results in detail, the evaluation of the results and the conclusions out of the results are described in the above mentioned test report. Excerpts from this test reports and from the test documentation are printed on the reverse.

Feuerungs- und Wärmetechnik

Klaus Kurth
Stellvertretender Leiter
Feuerungs- und Wärmetechnik

Industrie Service

Product description	Flame detector device
Type designation	**F130I**
Hardware version	V1.0.0.0
Software version	V1.0.0.0

The independent flame detector device is suitable for flame detection of burners and combustion systems for gaseous, liquid and pulverized solid fuels
– with permanent operation (only with ionisation flame sensor)
– with non-permanent operation.

The flame detector device fulfils the requirements of DIN EN 298:2012-11.

The control unit of the independent flame detector device also fulfils the requirements of DIN EN 61508: 2011-02 parts 1-7 (2nd ed.), for safety functions up to safety integrity level **SIL 3**.
The following safety parameters have been determined:

Probability of a dangerous failure (high demand / continuous mode)	**PFH_D**	**$4{,}9 \cdot 10^{-9}$ 1/h**
Safe failure fraction	**SFF**	**99,0 %**
Average diagnostic coverage	**DC_{AVG}**	**98,0 %**

These parameters have been calculated under the assumption of a Mean Time to Restoration MTTR= 8 h and a Proof Test Interval T_1= 10 years, which is equivalent to the specified life time of the flame detector device.

The control unit of the independent flame detector device is capable to be used as single device for safety instrumented functions (SIF) according to DIN EN 61511-1 up to safety integrity level **SIL 3**.

According to DIN EN ISO 13849-1:2008-12, table 4, the control unit of the independent flame detector device is capable to be used as single device for safety related control functions (SRCF) up to performance level **PL e.**

The control unit of the independent flame detector device also fulfils the requirements of DIN EN 50156-1, clause 10.5, for safety functions up to safety integrity level **SIL 3**.

Conditions

The conditions mentioned in test report no. C-F 1528-00/15 dated 2015-04-20 shall be considered during installation, commissioning and operation.

Note

The statements on SIL capability respectively PL capability as well as the calculation of probabilistic parameters are only related to the control unit of the independent flame detector device and do not include the UV flame sensors and the flame sensors for visible light.