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on the examination of a burner control system
according to DIN EN 61508 parts 2 – 3

Date: 2011-05-10

Our reference:
IS-TAF-MUC/ku

Order no. 1577634

Document:
CF13170111_SIL_BST.doc

Test Laboratory TÜV SÜD Industrie Service GmbH
Abteilung Feuerungs- und Wärmetechnik

TÜV SÜD Rail GmbH

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Subject of Test Type **FA1**

Ordering Company LAMTEC Meß- und Regeltechnik
für Feuerungen GmbH & Co KG
D-69190 Walldorf (Baden)

The document consists of
2 pages

Product description Burner control system

Basis of Test DIN EN 61508:2002, parts 2 – 3

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Test Report **TÜV SÜD Rail, no. TM83558G, Rev. 1.0**
dated 2011-01-28

The results in detail, the evaluation of the results and the conclusions out of
the results are described in the above mentioned test report.
A list of models and excerpts from the test report and from the test
documentation are printed on the reverse.

The test results refer exclusively
to the units under test.

Feuerungs- und Wärmetechnik

Johannes Steiglechner



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Headquarters: Munich
Trade Register Munich HRB 96 869
VAT ID No. DE129484218
Information pursuant to Section 2(1)
DL-InfoV (Germany) at
www.tuev-sued.com/imprint

Supervisory Board:
Karsten Xander (Chairman)
Board of Management:
Ferdinand Neuwieser (CEO),
Dr. Ulrich Klotz, Thomas Kainz

Telefon: +49 89 51 90 - 1027
Telefax: +49 89 51 90 - 3307
E-mail feuerung@tuev-sued.de
www.tuev-sued.de/is
TÜV®

TÜV SÜD Industrie Service GmbH
Feuerungs- und Wärmetechnik
Ridlerstraße 65
80339 München
Germany



Type designation	FA1		
Software version	5.400		
Hardware versions	663P0920	Rechnerelektronik/ Frontelektronik Etamatic	V4.0
	670P0922	Basisplatine FA1	V1.4

The burner control system is suitable for flame detection and control of burners and combustion systems for gaseous, liquid or solid fuels with **permanent operation**, also in hot air generators.

A failure modes, effects and diagnostic analysis (FMEDA) has been performed by the manufacturer and assessed by the test laboratory with positive results.

The FMEDA resulted in the following safety parameters:

Parameter	
Probability of a dangerous failure (high demand mode)	$PFH_D = 3,7 \cdot 10^{-9} \text{ 1/h}$
Probability of a dangerous failure (low demand mode)	$PFD_{AVG} = 6,7 \cdot 10^{-5}$
Safe failure fraction	$SFF \geq 99,0 \%$
Average diagnostic coverage	$DC_{AVG} = 98,4 \%$

These parameters have been calculated under the assumption of a Mean Time to Restoration MTTR= 8 hours, a Diagnostic Test Intervall $T_2= 24$ hours, and a Proof Test Interval $T_1= 10$ years, which is equivalent to the specified life time.

These parameters do not include external components of the burner control system, e.g. flame sensors resp. flame detector devices, as well as other sensors and actuators.

The burner control system fulfils the applicable technical requirements of DIN EN 61508:2002, parts 2–3 for safety integrity level **SIL 3**.

The burner control system is suitable to be used as single device for safety instrumented functions (SIF) according to DIN EN 61511-1 up to **SIL 3**.

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

The latest version of the "Hints and requirements for installation, commissioning, operation and verification", which are integral part of the test report on EC type-examination according to DIN EN 298, DIN EN 230, DIN EN 1643, etc., shall be considered.