



Not to be distributed outside of FM Approvals and its affiliates except by Customer

APPROVAL REPORT

IFS 110IM Automatic Burner Control

Prepared for:

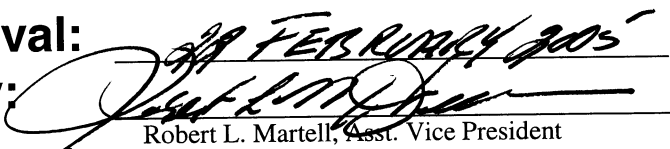
**G. Kromschroder AG
Segment Elektronik
Strotheweg 1
D-49504 Lotte-Wersen
Germany**

Project ID: 3022606

Class: 7610

Date of Approval:

Authorized by:

28 FEBRUARY 2005

Robert L. Martell, Asst. Vice President

IFS 110IM Automatic Burner Control

from

**G. Kromschroder AG
Postfach 2809
D-49018 Osnabruck
Germany**

I INTRODUCTION

- 1.1 G. Kromschroder AG has requested re-examination for approval of the updated IFS 110IM Automatic Burner Control System to FM Standard 7610. The changes to the IFS 110IM are internal, updated printed circuit, introduction of two micro-controllers and introduction of surface mount technology.
- 1.2 This Report may be freely reproduced only in its entirety and without modification.
- 1.3 Examination and tests were in accordance with the following FM Approval Standards:

Title	Class No.	Issue Date
Combustion Safeguards and Flame Sensing Systems	7610	June 1997

- 1.4 **Listing:** There is no listing change; the product will continue to appear in the FM Approval Guide as follows:

Model IFS 110 IM (or IMT) -W (or none) -3 (or 5, 10) / 1/1 (or 2/2) T (or N)

Used in conjunction with UVS 6T or UVS 8T ultraviolet flame sensors or flame rods. May be used in conjunction with IFW 15T relays for multiple burner control.

II DESCRIPTION

- 2.1 The IFM 110IM is a solid state control device used to provide safe start-up and safety shutdown of automatically lighted oil and gas burners. It will lock out if flame is detected prior to the ignition cycle or if flame is not detected during the ignition cycle safety time. The number immediately following the primary model designation indicates the nominal safety time of 3, 5, or 10 seconds. The corresponding ignition times are 2, 3, and 7.5 seconds, respectively. The /1/1 or /2/2 designations indicates flame failure response time, in seconds, for the main fuel valve and pilot fuel valve relays, respectively. A "W" suffix in the model number indicates that the control will provide a single automatic retry for ignition upon main flame failure. Flame input signals may be supplied by ultraviolet photo detectors or flame rods.
- 2.2 The IFW 15T flame relay module provides flame sensing circuitry that accepts signals from an ultraviolet photocell or flame rod. Detection of a flame signal results in closure of two dry contact output relays and the illumination of an indicator. This module is generally used in conjunction with an IFS 110IM control for multi-burner systems, but can be used by itself wherever fully automatic control is not required.

FM APPROVALS
Project ID: 3022606

The UVS6 and UVS8 flame sensors use ultraviolet photo detectors to provide a flame signal. The two models differ only in housing configuration.

III EXAMINATIONS AND TESTS

- 3.1 Sample models of the IFS 110 IM -3/1/1/N and IFS 110 IM -5/2/2/N were examined and tested at the FM Approvals facility in Norwood, MA by David Baer, an FM Approvals Senior Engineer. Examination showed that the IFS 110 IM -3/1/1/N, IFS 110 IM -3/2/2/N and all associated equipment were constructed in accordance with the manufacturer's specifications.
- 3.2 The operating temperature for the IFS 110 IM is specified to be -4°F (-20°C) to 140°F (60°C). The samples were conditioned for a minimum of four hours at each temperature extreme and tested. There was no significant change in the FFRT or the TFI timing. This test is satisfactory.
- 3.3 Electrical contacts for the IFS 110 IM are enclosed in a polymeric enclosure and when installed per manufacturer's instructions will provide adequate protection from damage and expected atmospheric conditions.
- 3.4 Durability testing of the relays used in interlock and safety shutdown circuits was not required as the components are the same as in the previously approved version. This satisfactorily meets the requirements of FM7610.
- 3.5 Safety-related operating characteristics such as trial for ignition times, flame failure response times, etc. are not readily accessible or alterable by the operator. These timing functions are programmed at the manufacturing site and are not alterable.
- 3.6 Presence of a flame signal prior to ignition (real or due to a fault) resulted in a shutdown and lockout. The gas safety shutoff valve was closed and the system required manual reset to initiate a restart. This satisfactorily meets the requirements of FM7610.
- 3.7 Failure to establish a flame (pilot or main flame) within the trial-for-ignition period resulted in a shutdown and lockout. Manual reset was required to initiate a restart. This satisfactorily meets the requirements of FM7610.
- 3.8 The IFS 110 IM with the flame scanner has a flame failure response time (FFRT) of 1.00 seconds using the UVS6T Infrared Flame Detector and a flame. This time was determined by testing the response time from simulated loss of the flame sensing signal to the time the gas safety shutoff valve output went low to shut the valve. This test was repeated 10 times and the 1.00 seconds is a result of the average plus 3 standard deviations at nominal line voltage. This test was repeated with the UVS8T Infrared Flame Detector with a FFRT of 1.10 seconds. This is satisfactory to meet the requirements of FM 7610.
- 3.9 The flame scanner is immediately operable when the IFS 110 IM system is powered up. This is satisfactory to meet the requirements of FM 7610.
- 3.10 The available trial-for-ignition periods do not exceed 10 seconds. The TFI was determined to be 1.87 seconds by using the average of 10 measurements plus 3 standard deviations. This time was determined by testing the response time from ignition to the time the gas pilot safety shutoff valve output went low to shut the valve. This is satisfactory to meet the requirements of FM 7610.

FM APPROVALS
Project ID: 3022606

3.11 The IFS 110 IM was tested at -15% and +10% of nominal rated input voltages and functions to specifications. There were no discernible changes in the operating characteristics of the system or in the FFRT or TFI.

IV MARKING

The label has not changed and the markings meet the Standard requirements as noted below:

The following information appears on the IFS 110 IM and meets Standard requirements.

- Manufacturer's name, model number, and serial number
- Voltage and frequency input requirements
- Temperature Specifications
- The FM Approvals Mark

V FACILITIES AND PROCEDURES AUDIT

The manufacturing site in Osnabruck, Germany is subject to follow up audit inspections. The facilities and quality control procedures must be found satisfactory to manufacture product identical to that examined and tested as described herein. This facility is currently subject to follow-up inspections and the addition of the products now examined to this manufacturer's currently approved line represented no change to manufacturing or quality control procedures that would require a special audit.

VI DOCUMENTATION

The following drawings/documents describe the IFS 110 IM and are filed under FM Project I.D. 3022606.

Drawing No.	Issue	Description
74337433	1	Leiterplatte-k. IFS110IM 230V
35454925	0	Anschlussplan IFS 110 IMT
75454929	0	Programmieranweisung IFS 11xIM
35454717	2	Anschlussplan IFS 110 IM 230V
35454927	1	Anschlussplan IFS 110 IM 115V
74337435	1	Leiterplatte IFS11xIM SMD
S4214012	1	Stromlaufplan IFS11xIM SMD-Platine
S4337441	0	Stromlaufplan IFS110IM GP

VII MANUFACTURERS RESPONSIBILITIES

As part of the listing requirements, FM Approvals requires assurance that subsequent units produced will present the same quality and reliability as previously examined. The manufacturer shall maintain a Quality Assurance Program which includes as a minimum: incoming, in-process, and final inspection and testing; equipment calibration; and drawing change control. The specific procedures used to control quality are best determined by the manufacturer. No change to this information is permitted without prior written consent of FM Approvals. Requests for changes

FM APPROVALS
Project ID: 3022606

must be submitted to FM Approvals on Form 797, Approved Product-Revision Report. Unauthorized changes may result in withdrawal of approval.

VIII CONCLUSION

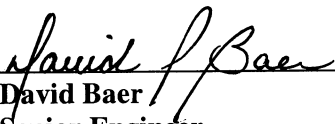
The IFS 110 IM described in section 1.4 meets FM Approvals requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this report.

EXAMINATION AND TESTING BY: David P. Baer

PROJECT DATA RECORD: PDR3022606

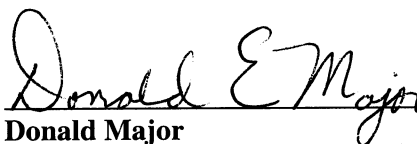
ATTACHMENTS: Representative copy of the Label

REPORT BY:



David Baer
Senior Engineer
Electrical Systems

REPORT REVIEWED BY:



Donald Major
Technical Team Manager
Electrical Systems

D - 49018 Osnabrück, Germany

**kron
schöder**

IFS 110IMT - 5/2/2N
84367710 G.0450 - 1809

110/120 VAC
50/60 Hz
Tamb. -4°F/+140°F
ts 5/2/2s
FM.NEMA1

CE FM APPROVED

LR 67684-3

