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# APPROVAL REPORT

**Project No:** PR462331

**Supplements Project No.:**

**Class:** 3545

**Product Name:** FM Approval for Multi-Loop Control System

**Product Type:** Limit Controller

**Name of Listing Company:** Gefran Spa

**Address of Listing Company:** Via Sebina, 74  
Provaglio, d'Iseo (BS) 25050  
Italy

**Customer ID:** 148244-1

**Customer website** [www.gefran.com](http://www.gefran.com)

**Prepared by**

The handwritten signature of Robert P Deardorff.

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Robert Deardorff

Advanced Engineer

**Reviewed by**

The handwritten signature of David Waite.

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David Waite

Ops VP, Approvals Group Manager

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J.E. Marquedant

VP, Manager - Electrical Systems

**4 September 2022**

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**Date of Approval**

## 1 INTRODUCTION

**1.1** Gefran Spa requested Approval of the apparatus listed in Section 1.4 for compliance with the standards listed in Section 1.3 as suitable for the listing categories described in Section 1.4.

**1.2** This report may be freely reproduced only in its entirety and without modification.

### 1.3 Standards

#### 1.3.1 United States Standards

Title	Number	Issue Date
Temperature Limit and Supervisory Switches	3545	2021

### 1.4 Listing

The product will be updated in the Approval Guide, an on-line resource of FM Approvals, as follows with all changes highlighted, deletions shown with strikethroughs and additions in red text:

#### 1.4.1 US Listings

Combustion Control Equipment | Temperature Limit and Supervisory Switches  
| **Temperature Limit Switches, Non-Indicating**

### GFXTERMO4-abcd

**a = 0, R, D, C, T**

**b = 0, 1, 2**

**c = 0, M, P, C, C1, D, E, E1, E2, E4, E5, E8**

**d = optional code for specialization**

## 2 DESCRIPTION

The GFXTERMO4 is a multiloop controller that can control up to four process loops independently. I/O configuration is flexible due to a programming tool that guides users in the selection of parameters. The GFXTERMO4 was evaluated for compliance as a temperature limit controller to FM 3545 requirements.

## 3 EXAMINATIONS AND TESTS

### 3.1 Examination

Samples were submitted for examination and testing. The samples were considered to be representative of the product line and were examined, tested, and compared to the

manufacturer's drawings. All data is on file at FM Approvals along with other documents and correspondence applicable to this program.

### **Operational Characteristics**

The controller device operated as intended by the manufacturer. Reset required intervention manually and process temperature was within the setpoint limits before the reset can be successful. Casual adjustment of parameters and settings are not permitted without authoritative codes or passwords. This is considered satisfactory

### **Actuation Point Accuracy and Repeatability**

Accuracy of the actuation point measured within the manufacturers specification and did not exceed 5% of the full-scale value of the measurement range. Repeatability of the actuation point did not exceed 1% of the controller setpoint value. This is considered satisfactory.

### **Ambient Temperature Effects**

The sample was conditioned at 0°C and +50°C for a period of 4 hours at each temperature. The controller was put through an operational test at these temperatures and proper operation was maintained at both temperature extremes and within the allowed tolerance. This is considered satisfactory.

### **Endurance**

The controller device was energized and subjected to an electrical load within its maximum allowable contact rating [3A@120VAC] This is considered satisfactory.

### **Voltage Variation**

Input voltages were varied on the controller sample from 110% of the rated operating voltage down to 85% of nominal rated input and exposed to normal operating conditions. There was no failure to operate at these low and high voltage levels. This is considered satisfactory.

### **Dielectric**

Controller was exposed to a test voltage of 500VAC applied between inputs and ground for a period of 60 seconds. There was no evidence of excessive leakage or electrical breakdown. This is considered satisfactory.

All testing and analysis considered appropriate was conducted and verified to be in compliance with the Standards defined in Section 1.3.

## **4 MARKING**

### **4.1** Marking shall be on the product or, if not possible due to size, on its packaging or label accompanying the product shall include the following information:

- Name & address of manufacturer or marking traceable to the manufacturer;
- Date of manufacture or code traceable to the date of manufacture or lot identification;
- Model number, size, rating, capacity, wiring information, operating temperatures, etc as appropriate.

## 5 REMARKS

- 5.1** Extreme care should be taken with the installation of this equipment. The latest edition of the manufacturer's instruction manual must be followed completely, and any problems should be resolved by consultation with the factory or the authorized representative.
- 5.2** All installation wiring shall be in accordance with the appropriate national electrical code.
- 5.3** An Approval examination of equipment such as this can only evaluate typical configurations. Although those components identified in this report have been tested, it is beyond the scope of such an examination to test all possible configurations. It is therefore necessary, that those responsible for the setup and acceptance of specific installations take special care to verify that the equipment, including programmable functions, is configured to operate properly for the required performance of that installation.
- 5.4** Tampering and replacement with non-factory components may adversely affect the safe use of the system.
- 5.5** The products(s) discussed in this report were certified by FM Approvals under a Type 5 Certification System as identified in ISO/IEC 17067.

## 6 SURVEILLANCE AUDIT

The design and manufacturing facilities at the following location(s) shall be visited on a routine basis. The facility processes and quality control procedures in place have been determined to be satisfactory to manufacture product identical to that tested and Approved. An FM Approved Products/Specification-Tested Revision Request Form shall be submitted to FM Approvals for requesting to manufacture product at any additional or alternate manufacturing facilities which are not listed below.

### Design

Gefran Spa  
Via Sebina, 74  
Provaglio, d'Iseo (BS) 25050  
Italy

### Manufacturing

Gefran Spa  
Via Sebina, 74  
Provaglio, d'Iseo (BS) 25050  
Italy

## 7 MANUFACTURER'S RESPONSIBILITIES

- 7.1** Documentation that is applicable to this approval is on file at FM Approvals and listed in the Documentation File, Section 8, of this report. No changes of any nature shall be made unless notice of the proposed change has been given and written authorization obtained from FM Approvals. The FM Approved Products/Specification-Tested Revision Request Form shall be forwarded to FM Approvals as notice of proposed changes.
- 7.2** The Manufacturer is responsible for control of the product marking and installation / operation / maintenance instructions for the System.
- 7.3** The manufacturer shall provide installation / operation / maintenance instructions with each system.

- 7.4** In accordance with the Master Agreement, the manufacturer shall make full and immediate disclosure to FM Approvals of all information concerning any defect in, or potential hazard of, the product or service manufactured or provided by the Customer which is Approved by, or being examined by, FM Approvals. The manufacturer shall make all necessary arrangements for the investigation of complaints / anomalies applicable to this approval and shall keep records of all complaints / anomalies including actions taken.
- 7.5** On 100% of production, manufacturer shall provide marking in accordance with the marking drawing(s) listed in the Blueprint Report for the Approved equipment.

**8 DOCUMENTATION**

See attached blueprint report.

**9 CONCLUSION**

The GFXTERM04 multi loop controller described in section 1.4.1 meets FM Approvals requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this report.

**PROJECT DATA RECORD:** PR462331

**ATTACHMENTS:** Blueprint report 462331

# Blueprint Report

**Gefran SpA (148244)**

Class No **3545**

Original Project I.D. **462331**

<b>Drawing No.</b>	<b>Revision Level</b>	<b>Drawing Title</b>	<b>Last Report</b>	<b>Electronic Drawing</b>
3917D1	1	Barra-Din	462331	Yes (pdf)
45297X	1	Component / trace Board Assembly	462331	Yes (pdf)
4645D4	4	Carter GFX-Thermo	462331	Yes (pdf)
4646D_518522	A	Regulater E Power Controller (CPU Cover)	462331	Yes (pdf)
51854	1	Etichetta Frontale	462331	Yes (pdf)
5392D6	6	Sertermica Laterale GFXTERMO4	462331	Yes (pdf)
5392D9	7	Label Data	462331	Yes (pdf)
55618	1	Etichetta adesiva	462331	Yes (pdf)
80397O	07-2022	Configuration and Program Manual	462331	Yes (pdf)
DIS-00659-00	1	Etichetta adesiva frontale GFXTERMO4	462331	Yes (pdf)
DIS-00847-01	1	Tappo Trasparente per Led GFX4 TERMO4	462331	Yes (pdf)
PMS-00002-01	1	CPU Per Geflex	462331	Yes (pdf)
PMS-00003-01	1	CPU Per Geflex 1TA	462331	Yes (pdf)
SCH-00005-002	1	Scheda CPU	462331	Yes (pdf)