

1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062 USA
T: (781) 762-4300 F: (781) 762-9375

APPROVAL AGREEMENT

The Agreement is made by and between Factory Mutual Research Corporation (herein called Factory Mutual Research)

and **The Viking Corporation, Hastings, MI 49058**

(herein called the Client). The Client is making a product or providing a service known and described as:

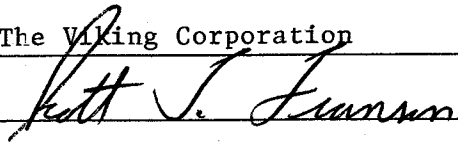
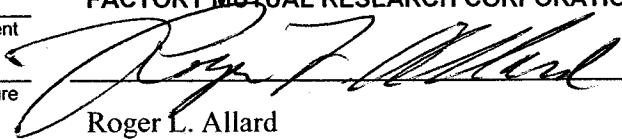
**MODEL VK300, VK302, VK304, VK306, VK325, VK329,
VK350, VK352, VK556, VK566, VK600 AND VK602
BULB TYPE AUTOMATIC SPRINKLERS WITH
NOMINAL DISCHARGE COEFFICIENTS OF 2.8, 5.6
AND 8.0 GAL/MIN/(PSI)^{1/2} WITH ALTERNATE 3 mm
BULB**

This product or service has been examined by Factory Mutual Research as described in a report bearing

Job Identification **3004444**, dated **13 June 2002**.

In consideration of Factory Mutual Research Approval of the product or service, the Client is authorized to indicate such Approval, as stated by the above report, and agrees to the following and terms stated on the reverse side of this Agreement:

1. The Client shall place a unique identification mark (i.e. model or type number) on the product as stated in the above report and shall not place this mark on any other product unless covered by a separate Agreement with Factory Mutual Research.
2. The Client shall use the Factory Mutual Research Approval Mark on the product, but shall not use this mark on any other product unless such other product is covered by separate Agreement with Factory Mutual Research.
3. The Client shall not use, reproduce or distribute the above referenced report by Factory Mutual Research except in its entirety without any change, deletion or addition thereto. The Client agrees that Factory Mutual Research may distribute the referenced report and related information within FM Global. *(See Over)*

The Viking Corporation	FACTORY MUTUAL RESEARCH CORPORATION
	
Client	Signature
Scott T. Franson	Roger L. Allard
Name	Name
Director, Sprinkler Division	Group Manager - Hydraulics
Title	Title
210 N. Industrial Park Rd	June 21, 2002
Hastings MI 49058	Date
Address	Date
July 2, 2002	
Date	

NOT to be distributed outside the FACTORY MUTUAL SYSTEM, except by CLIENT.

APPROVAL REPORT

**MODEL VK600 AND VK602
BULB TYPE
CONTROL-MODE (DENSITY/AREA) EXTENDED COVERAGE LIGHT
HAZARD (ECLH)
RECESSED PENDENT
STANDARD AND QUICK RESPONSE
AUTOMATIC SPRINKLERS WITH
NOMINAL DISCHARGE COEFFICIENTS OF 5.6 AND 8.0
GAL/MIN/(PSI)^{1/2}
FINISHES OF PLAIN BRASS, CHROME AND POLYESTER COATING
IN NOMINAL TEMPERATURE RATINGS OF 135, 155 AND 175°F
(57, 68 AND 79°C)**

Prepared For:

**The Viking Corporation
210 North Industrial Park Road
Hastings, MI 49058**

**J. I. 3007692
Class 2022
3 October 2000**

FACTORY MUTUAL



1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, Massachusetts 02062



FACTORY MUTUAL RESEARCH

JOB IDENTIFICATION 3007692

Factory Mutual Research

1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, Massachusetts 02062

J. I. 3007692
Class 2022

3 October 2000

**MODEL VK600 AND VK602
BULB TYPE
CONTROL-MODE (DENSITY/AREA)
EXTENDED COVERAGE LIGHT HAZARD (ECLH)
RECESSED PENDENT
STANDARD AND QUICK RESPONSE
AUTOMATIC SPRINKLERS WITH
NOMINAL DISCHARGE COEFFICIENTS OF 5.6 AND 8.0 GAL/MIN/(PSI)^{1/2}
FINISHES OF PLAIN BRASS, CHROME AND POLYESTER COATING
IN NOMINAL TEMPERATURE RATINGS OF
135, 155 AND 175°F
(57, 68 AND 79°C)**

from

**The Viking Corporation
210 North Industrial Park Road
Hastings, MI 49058**

I INTRODUCTION

- 1.1 Viking requested an Approval examination of their Model VK600 and VK602 bulb type control-mode (density/area) extended coverage light hazard (ECLH) recessed pendent standard and quick response automatic sprinklers with nominal discharge coefficients of 5.6 and 8.0 gal/min/(psi)^{1/2} and finishes of plain brass, chrome and polyester coating in nominal temperature ratings of 135, 155 and 175°F (57, 68 and 79°C). The Model VK600 is the sprinkler with a nominal discharge coefficient of 5.6 gal/min/(psi)^{1/2} while the Model VK602 is the sprinkler with a nominal discharge coefficient of 8.0 gal/min/(psi)^{1/2}.
- 1.2 The Model VK600 and VK602 automatic sprinklers were previously designated as Model M sprinklers.
- 1.3 This Report is limited to the examination of the sprinklers as described in Section II of this Report.
- 1.4 The tests were conducted in accordance with the appropriate sections of Factory Mutual Research Approval Standard Class Series 2000.

II DESCRIPTION

- 2.1 The Viking Model VK600 and VK602 automatic sprinklers utilize a bulb type heat activated element which ruptures within a predetermined temperature band, allowing water to flow at a specified rate and in a particular distribution pattern for a given supplied water pressure. The sprinklers are designed for use in automatic sprinkler fire protection systems as a means of fire control and are rated for 175 psi (1207 kPa) maximum system pressure. This model is further described in the attached manufacturer's drawings.

FACTORY MUTUAL RESEARCH
JOB IDENTIFICATION 3007692

- 2.2 The scope of this examination is limited to the Model VK600 and VK602 control-mode (density/area) extended coverage light hazard (ECLH) recessed pendent sprinklers. The recessed version utilizes the Model VK600 and VK602 ECLH pendent in the Model E-1 ½ in. (12.7 mm) adjustable recessed escutcheon. The balance of the tests required for Approval of these sprinklers were conducted under project J.I. 3005494. These sprinklers are otherwise identical to the currently Approved Model VK600 and VK602 (previously designated as Model M) pendent automatic sprinklers which are further described in the following Approval Reports:

J.I. 3005494 ECLH pendent; new deflector, brass, chrome, polyester coated

J.I. 0Y4A0.AH ECLH pendent; plain brass

III TESTS

3.1 SENSITIVITY - RECESSED, FLUSH AND CONCEALED

Several samples of each nominal temperature rating were tested in accordance the procedures for determining the sensitivity of recessed, flush and concealed sprinklers. All values for actual response time were determined to be within the maximum allowable time limits. Sprinklers having nominal temperature ratings of 135 and 155°F (57 and 68°C) met the requirements for quick response while sprinklers having a nominal temperature rating of 175°F (79°C) met the requirements for standard response. The results were deemed satisfactory.

- 3.2 Unless otherwise noted, the above tests were all performed at the Factory Mutual Research Hydraulics Laboratory in West Glocester, Rhode Island. The tests were conducted in accordance with Factory Mutual Research Approval Standard for Class Series 2000.

- 3.3 No further testing was considered necessary as this model shares similar parts with the presently Approved Model VK600 and VK602 as described in Section II of this Report.

IV EXAMINATION

The sprinklers submitted for Approval were examined and found to represent the design adequately. A complete set of drawings for this design is kept on file at Factory Mutual Research.

V MARKINGS

- 5.1 All markings, including the Factory Mutual Research Mark of Approval, remain the same as described in the above cited Reports.
- 5.2 The bulb colors, as they apply to nominal temperature ratings covered in this Report, conform to the color codes identified in Appendix Table 1.

VI REMARKS

- 6.1 The Model VK600 and VK602 sprinklers described in this Report are Approved only when manufactured at the following facility:

The Viking Corporation
210 North Industrial Park Road
Hastings, MI 49058

This facility has been audited and found to be satisfactory.

- 6.2 The FM Global Property Loss Prevention Data Sheets should be strictly adhered to when installing these sprinklers. Any deviations from the Data Sheets may drastically decrease the effectiveness of the sprinkler.
- 6.3 These bulb type control-mode (density/area) extended coverage light hazard (ECLH) recessed pendent automatic sprinklers with nominal discharge coefficients of 5.6 and 8.0 gal/min/(psi)^{1/2} are Approved in finishes of plain brass, chrome and polyester coating with the Model E-1 ½ in. (12.7 mm) adjustable recessed escutcheon in nominal temperature ratings per the following list only:
- | | | | |
|-------------|------|-----------------------------|-------------------|
| Model VK600 | K5.6 | 135 and 155°F (57 and 68°C) | Quick Response |
| Model VK600 | K5.6 | 175°F (79°C) | Standard Response |
| Model VK602 | K8.0 | 135 and 155°F (57 and 68°C) | Quick Response |
| Model VK602 | K8.0 | 175°F (79°C) | Standard Response |

VII CONCLUSION

The Viking Model VK600 and VK602 automatic sprinklers, as described in this Report, and as manufactured at the above location, meet Factory Mutual Research Approval requirements. The Approval is effective when the Approval Agreement is signed by Viking and received by Factory Mutual Research.

ATTACHMENTS:

Primary Materials List, Manufacturer's Drawing
Numbers: 06778B, 07077B, 06409B, 05459A

EXAMINATION BY:

Claude Bosio

TESTS BY:

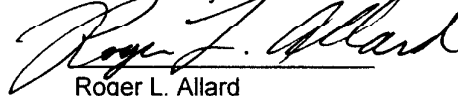
Hydraulics Laboratory personnel

Report By:



Claude Bosio
Project Engineer
Hydraulics Section

Reviewed By:



Roger L. Allard
Manager
Hydraulics Section

APPROVAL REPORT

MODEL M

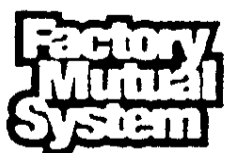
3 mm JOB BULB TYPE

1/2 AND 17/32 IN. NOMINAL ORIFICE, EXTENDED COVERAGE,
PENDENT AUTOMATIC SPRINKLER WITH
NOMINAL TEMPERATURE RATINGS OF 135 AND 155°F (57 AND
68°C) (QUICK RESPONSE) AND 175°F (79°C) (STANDARD
RESPONSE) FOR USE IN LIGHT HAZARD OCCUPANCIES

Prepared For:

The Viking Corporation
210 North Industrial Park Road
Hastings, MI 49058

Job Identifier (J.I.): 0Y4A0.AH
Class: 2022
Report Date: January 31, 1995



Factory Mutual Research