

Factory Mutual Research Corporation  
1151 Boston-Providence Turnpike  
P.O. Box 9102  
Norwood, Massachusetts 02062

**J. I. 0D0A5.AE**  
**(3615)**

**November 20, 1998**

**MODELS HS-15ExdFM AND HS-15ExdFM/T LOUDSPEAKERS  
FOR  
HAZARDOUS (CLASSIFIED) LOCATIONS**

**from**

**Den Norske Hoyttalerfabrikk  
3770 Kragero  
NORWAY**

**I INTRODUCTION**

1.1 Den Norske Hoyttalerfabrikk (manufacturer) requested Factory Mutual Research Corporation (FMRC) Approval of their Models HS-15ExdFM and HS-15ExdFM/T Loudspeakers as explosionproof for Class I, Division 1, Groups B, C and D hazardous (classified) locations; indoor/outdoor (IP67).

1.2 Approval of the Loudspeakers is based on the applicable requirements of the following standards:

<u>TITLE</u>	<u>AUTHOR-NUMBER</u>	<u>DATE</u>
Electrical Equipment For Use In Hazardous (Classified) Locations General Requirements	FMRC-3600*	1989
Explosionproof Electrical Equipment General Requirements	FMRC-3615*	1989
Electrical And Electronic Test, Measuring, and Process Control Equipment	FMRC-3810*	1989
Degrees of Protection Provided by Enclosures (IP Code)	IEC-529	1989

\* These standards are based in large part on the applicable American National Standards Institute (ANSI) standards.

1.3 The specific models described by this report are identified as follows:

**Models HS-15ExdFM and HS-15ExdFM/T. Loudspeakers.**  
XP/I/1/BCD/T6; IP67

1.4 As described by this report, the construction of the detectors provides the degree of protection against electrical shock, fire, and injury required for hazardous (classified) locations. Installation must be in accordance with the manufacturer's instructions and the National Electrical Code.

1.5 All testing and evaluation for this product was performed by NEMKO in Oslo, Norway.

## II DESCRIPTION

2.1 The Models HS-15ExdFM and HS-15ExdFM/T Loudspeakers are rated for 100 Vac at 15 Watts. The difference between the Models HS-15ExdFM and HS-15ExdFM/T is that the Model HS-15ExdFM/T contains a transformer and limit switch. Other than the transformer, the two models are identical. The transformer and limit switch carry a European component certification.

2.2 The enclosure used for both the Models HS-15ExdFM and HS-15ExdFM/T Loudspeakers are identical. The electronics are housed in a dual-compartment, cast aluminum alloy housing. There is a spigot joint flamepath on the enclosure cover for the terminal compartment and a cylindrical flamepath between the base and the loudspeaker cone. One or two ½"-14 NPT conduit ports can be provided in the terminal compartment for electrical connection to the power and communications terminals. There is a threaded line bushing between the two compartments. There is a sintered bronze disc in the neck of the loudspeaker cone. The aluminum alloy contains less than 6% magnesium. A stainless steel bracket which is permanently mounted to the enclosure is used for mounting.

2.3 The loudspeakers have an ambient operating temperature range of -20°C to +40°C. The enclosure carries an IEC-526, IP67 rating which concludes that the enclosure is dust-tight and protected against temporary immersion.

2.4 For additional descriptive information, refer to the attached partial reproduction of the assembly drawing.

## III MARKING

3.1 The metallic nameplate is permanently attached by stainless steel drive pins to the side of the enclosure base and includes the following information:

- Manufacturer's name
- Model number
- Serial number
- Electrical ratings

- Hazardous location rating
- IP rating
- FMRC Approval Marking
- Warning "DO NOT OPEN WHILE ENERGIZED"
- Warning "NOT INCLUDING ACIDIC ATMOSPHERES"
- Restriction "SEAL CONDUITS AT ENCLOSURE"

3.2 A partial reproduction of the label from drawing 923 is included as an attachment to this report.

#### **IV EXAMINATION AND TESTS**

All testing and examination was performed by NEMKO, Oslo, Norway under the mutual test recognition agreement. The data is attached to this report in Appendix A.

#### **V REMARKS**

Installation shall be in accordance with the National Electrical Code ANSI/NFPA-70 and the manufacturer's instructions.

#### **VI FACILITIES AND PROCEDURES AUDIT**

The Den Norske Hoyttalerfabrikk design and manufacturing facilities in Kragero, Norway are subject to follow-up audit inspections by FMRC. The facilities and quality control procedures in place were examined as part of this program and have been found to be satisfactory to manufacture the loudspeakers identical to that tested and Approved.

#### **VII MANUFACTURER'S RESPONSIBILITIES**

7.1 The manufacturer shall advise FMRC of all proposed changes to the documents listed in Section IX via form 797, Approved Product Revision Report.

7.2 On 100% of production the manufacturer shall conduct routine inspection of the protective grounding system.

7.3 On 100% of production, the loudspeakers shall be dielectric tested. The power input connections shall withstand for one minute, with no insulation breakdown, the application of 1000 Vac or 1420 Vdc with respect to the protective ground terminal. Alternatively, test potentials 20% higher may be applied for at least one second.

**WARNING:** The dielectric test required may present a hazard of injury to personnel and/or property and should only be performed under controlled conditions, and by persons knowledgeable of the potential hazards of such testing to minimize the likelihood of shock and/or fire.

## VIII CONCLUSION

The Den Norske Hoyttalerfabrikk Models HS-15ExdFM and HS-15ExdFM/T Loudspeakers, as herein described, meet FMRC requirements. Approval is effective when the Approval Agreement is signed and received by FMRC.

## IX DOCUMENTATION FILE

The following documentation is applicable to this equipment and is on file at FMRC. No changes of any nature shall be made unless notice of the proposed change has been given and written authorization obtained from FMRC. The Approved Product - Revision Report, FMRC Form 797, shall be forwarded to FMRC as notice of proposed changes.

<u>DOCUMENT</u>	<u>DOCUMENT TITLE</u>	<u>REVISION</u>
923	HS-15ExdFM/T Cert. Drawing	C
1027-A3	HS-15ExdFM/T Mech. Drawing	-

**TESTS AND EXAMINATION BY:** NEMKO in Oslo, Norway as described in Appendix A

**ATTACHMENTS:**

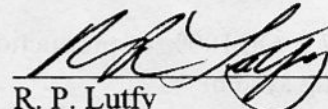
- Appendix A (28 Pages, NEMKO Test Reports)
- Partial reproduction of drawing 923 (Label)
- Partial reproduction of drawing 923 (Assembly)

**REPORT BY:**



David C. Anderson  
Electrical Project Engineer  
Electrical Section

**REPORT REVIEWED BY:**



R. P. Lutfy  
Electrical Section Manager