



Member of the FM Global Group

Approval Standard for Repair Service for Process Control Equipment Used in Hazardous (Classified) Locations

Class Number 3606

November 1998

Foreword

The FM Approvals certification mark is intended to verify that the products and services described will meet FM Approvals' stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of Approval Standards is to present the criteria for FM Approval of various types of products and services, as guidance for FM Approvals personnel, manufacturers, users and authorities having jurisdiction.

Products submitted for certification by FM Approvals shall demonstrate that they meet the intent of the Approval Standard, and that quality control in manufacturing shall ensure a consistently uniform and reliable product. Approval Standards strive to be performance-oriented. They are intended to facilitate technological development.

For examining equipment, materials and services, Approval Standards:

- a) must be useful to the ends of property conservation by preventing, limiting or not causing damage under the conditions stated by the Approval listing; and
- b) must be readily identifiable.

Continuance of Approval and listing depends on compliance with the Approval Agreement, satisfactory performance in the field, on successful re-examinations of equipment, materials, and services as appropriate, and on periodic follow-up audits of the manufacturing facility.

FM Approvals LLC reserves the right in its sole judgment to change or revise its standards, criteria, methods, or procedures.

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1.0 INTRODUCTION

1.1 Purpose

This standard serves as the basis for FM Approval of independently owned facilities that repair FM Approved process control equipment for hazardous (classified) locations.

1.2 Scope

This standard shall apply to the repair of FM Approved process control equipment under the following categories:

- Intrinsically safe and associated apparatus for Class I, II or III, Division 1, Groups A, B, C, D, E, F and G, and Class I, Zones 0 and 1, Groups IIA, IIB, IIC, or
- Nonincendive for Class I, Division 2, Groups A, B, C and D, and/or
- Explosionproof for Class I, Division 1, Groups A, B, C, and D, and flameproof Class I, Zone 1
- Dust-Ignitionproof for Class II, Division 1, Groups E, F, and G, and/or
- Encapsulated Apparatus for Class I, II, III, Division 1, and/or
- Suitable for Class II, Division 2, Groups F and G, and/or,
- Suitable for Class III, Divisions 1 and 2, and/or
- Purged or pressurized for Class I, II, Divisions 1 and 2, Groups A, B, C, D, E, F, and G, and/or
- Non-hazardous (ordinary) locations
- Increased Safety Class I, Zone 1.

This standard does not apply:

- when modifications that have not been previously authorized by FM Approvals are made to the equipment; or
- to repairs made by facilities owned by the manufacturer.

The manufacturer's repair facilities are covered by the Approval Agreement for the listed product. That Agreement requires the manufacturer to provide adequate facilities for repair of the listed product. Modifications to a product are initiated by the manufacturer and authorized by FM Approvals or conducted by others with the agreement of the manufacturer and FM Approvals.

1.3 Applicable Standards

This standard is intended to be used in conjunction with repair of process control equipment that is FM Approved to one or all of the following FM Approval Standards:

<i>Title</i>	<i>Class No.</i>	<i>Issue Date</i>
Electrical Equipment for Use in Hazardous (Classified) Locations — General Requirements	3600	November 1998
Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1, Hazardous (Classified) Locations	3610	October 1988
Electrical Equipment for Use in Class I, Division 2; Class II, Division 2; and Class III, Division 1 and 2 Hazardous Locations	3611	April 1986
Explosionproof Electrical Equipment General Requirements	3615	March 1989
Encapsulated Apparatus	3612	(Proposed)
Purged and Pressurized Electrical Equipment for Hazardous (Classified) Locations	3620	March 1989
Electrical and Electronic Test, Measuring, and Process Control Equipment	3810	March 1989

1.4 Basis for Requirements

The requirements of this standard are based on experience, and/or the standards of other organizations. The advice of manufacturers, users, and trade associations was also considered.

The requirements of this standard are intended primarily as guides, and strict conformity is not always mandatory. Repair facilities having procedures not covered by this standard may be Approved if performance equal or superior to that required by this standard is demonstrated, or if the intent of the standard is met. Alternatively, repair facilities which do meet all the requirements identified in this standard may not be Approved if other conditions which adversely affect the repair of the Approved product exist or if the intent of this standard is not met.

1.5 Basis for FM Approval

FM Approval is based on satisfactory evaluation of the repair service facilities and procedures.

1.6 Basis for Continued Approval

Continued Approval is based upon:

- the use of acceptable quality control procedures;
- satisfactory field experience;
- compliance with the terms stipulated in the Approval Agreement; and
- periodic re-examination and audit inspection to evaluate continued conformity to requirements originally evaluated.

1.7 Effective Date

The effective date of an Approval Standard mandates that all Approvals after the effective date shall satisfy the requirements of that standard. The effective date shall apply to the entire Approval Standard.

The effective date of this standard is the publication date.

1.8 Definitions

For purposes of this standard, the following terms apply:

Independently Owned Facility — A facility that is owned and operated by other than the specific manufacturer of the Approved product being repaired.

Modification — Work performed on the unit that changes it from the configuration as shipped from the original manufacturer.

Original Manufacturer — The manufacturer of the product under repair to whom the FM Approval was issued.

Repair — Work performed to the unit that would bring it back to its original condition that was FM Approved.

Process Control Equipment — Equipment which measures and controls directly or indirectly an industrial process through a final control element(s).

2.0 APPROVAL APPLICATION

To apply for FM Approval as a repair service, send a letter requesting an audit addressed to:

Electrical Group Manager
FM Approvals
1151 Boston-Providence Turnpike
Post Office Box 9102
Norwood, Massachusetts 02062 U.S.A.

The letter should indicate the following:

- a. The location of the repair service facility to be audited.
- b. The specific manufacturer(s) of FM Approved process control equipment that you are seeking to repair at the facility to be audited.
- c. The type/model/series of products to be repaired at this facility.
- d. A detailed summary of the specific requirements as listed in Section 3 of this standard.

3.0 REQUIREMENTS

3.1 Parts Procurement

3.1.1 Requirement

The repair facility shall have written procedures on each type of Approved product to be repaired. Only original manufacturer's parts, or parts specifically listed by FM Approvals shall be used for repair.

3.1.2 Verification

Procurement of parts shall be documented to include, as a minimum, purchase order history and verification of receipt and stocking via the part number. Verification shall be made by audit of applicable documents.

3.2 Documentation

3.2.1 Requirement

The repair facility shall have written procedures by which original manufacturer's documentation, subsequent revisions and bulletins can be obtained.

3.2.2 Verification

Documentation shall consist of, but not be limited to, schematics, assembly and artwork drawings, parts lists, materials specifications, inspection and test procedures, and service manuals. Verification shall be by inspection of applicable documents during audit.

3.3 Training

3.3.1 Requirement

The repair facility shall have written procedures addressing proper training of the persons doing the repair. This training shall encompass original manufacturer's workmanship standards and unique areas within the product under repair that may be critical to the Approval rating.

3.3.2 Verification

Manufacturer's technical training attendance or other evidence of technical qualification shall be verified by audit.

3.4 Traceability and Marking

3.4.1 Requirement

The repair facility shall have written procedures for tracing the equipment that was repaired by that facility.

3.4.2 Verification

The repaired equipment shall be marked indicating the name and location of the repair center. The marking shall not affect the original manufacturer's marking. The marking shall not be applied by mechanical means, such as drive screws, that would damage the housing. Label adhesion to the equipment enclosure material shall not degrade due to exposure to chemicals of the Group(s) for which the equipment is rated.

3.5 Identifying and Segregating

3.5.1 Requirement

The repair facility shall identify and segregate FM Approved products from non-FM Approved products so that Approved products will be serviced with appropriate materials.

3.5.2 Verification

Materials used in the repair of the FM Approved product shall be identified and segregated. Areas shall be controlled as to prevent accidental usage of inappropriate materials. If movement to a controlled area is impractical due to size or configuration, the materials for repairing FM Approved products shall be conspicuously marked or tagged.

3.6 Inspection and Tests

3.6.1 Requirement

The repair facility shall have a method of inspecting and testing the product after the repair to verify conformity to the original manufacturer's specifications.

3.6.2 Verification

Documentation shall be kept to demonstrate that operations have indeed been completed as evidenced, for example, by inspection stamps or signature.

3.7 Calibration

3.7.1 Requirements

- a. The repair facility shall have in place a system for the calibration of all equipment used in the repair of FM Approved equipment.
- b. The repair facility shall require that the providers of calibration services document their capabilities to perform these services.

3.7.2 Verification

- a. The calibration system should provide for test and measuring equipment accuracy by the timely detection and correction of deficiencies. Procedures shall be verified by reference to the quality manual governing the repair service.
- b. Calibration shall be done by the manufacturer or a commercial facility utilizing standards whose calibration is certified as being traceable to national standards; or have been derived from acceptable values of natural physical constants; or have been derived by the ratio type of self-calibration techniques; or are based upon national standards in countries whose standards are compared, at planned intervals, with international or U.S. National standards. Verification shall be made by reference to the certificates on file for applicable equipment.
- c. Test equipment records for providers of calibration services shall include reports or certificates of calibration for each item of measuring and test equipment and for each standard. They should provide a description or identification of the item, calibration interval, date of last calibration, and calibration results or out-of-tolerance conditions. These records shall be available for review by FM Approvals. The equipment shall have an affixed label indicating last calibration date and next due date for calibration.

4.0 OPERATIONS REQUIREMENTS

4.1 Demonstrated Quality Control Program

An inspection of the repair facility shall be part of the Approval. Its purpose shall be to determine that equipment, procedures, and quality controls are properly maintained to repair a product to the same condition as it was originally manufactured and Approved.

4.2 Facilities and Procedures Audit (F&PA)

Unannounced follow-up inspections shall be conducted to assure continued quality control and uniformity in the repair of the Approved product.

