

# APPROVAL REPORT

**GAS ANALYZERS  
Series 2020 and 3020  
FOR HAZARDOUS (CLASSIFIED) LOCATIONS**

**Prepared For:**

**Teledyne Analytical Instruments  
16830 Chestnut Street  
City of Industry, CA 91749**

**J.I. 1D4A7.AE  
(3615)  
April 4, 2000**

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16830 Chestnut Street  
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## I INTRODUCTION

1.1 Teledyne Analytical Instruments (Manufacturer) requested Factory Mutual Research Approval of their Series 2020 and 3020 process gas analyzers as explosionproof for Class I, Division 1, Groups B\*, C, and D indoor and outdoor (Type 4) hazardous (classified) locations.

\* Units with suffix *FAB* are suitable for Group BCD applications. Units with suffix *FACD* are suitable for Group CD applications.

1.2 The specific models described by this report are identified as follows.

**2020-a-FAB. Thermal Conductivity Analyzer**

a = Options L, C, or R

**2020-a-FACD. Thermal Conductivity Analyzer**

a = Options L, C, or R

**3020M-a-FACD. Paramagnetic Oxygen Analyzer**

a = Options CV or Blank.

**3020M-a-FAB. Paramagnetic Oxygen Analyzer**

a = Options CV or Blank.

**3020P-a-FACD\*. Percent Oxygen Analyzer**

a = Options CV, MA, or Blank.

\* Maximum Oxygen Concentration 25%

2.2 The Model 2020 uses the thermal conductivity process for measuring the concentration of various gas components of mixtures.

2.3 The Model 3020M uses the paramagnetic cell measurement process to obtain oxygen content of mixtures from low percentage through 25% by volume.

2.4 The Model 3020P uses the electro-chemical cell measurement process to obtain oxygen content of mixtures from low percentage through 25% by volume.

2.5 The Model 3020T uses the electro-chemical cell measurement process to obtain oxygen content of mixtures from parts-per-million through 25% by volume.

2.6 For additional descriptive information, please refer to the attached sales brochures.

### III MARKING

The analyzer label is fabricated of stainless steel and is permanently attached to the enclosure with four non-penetrating rivets. Label drawing A-69185, Revision 1 is included as an attachment to this report. This label includes:

- Manufacturer's name and address
- Model number
- Serial Number
- Electrical ratings
- Hazardous location ratings
- Enclosure Type rating
- Factory Mutual Research Approval Mark

### IV EXAMINATION AND TESTS

4.1 A sample 3020T Trace Oxygen Analyzer along with samples of both the Group B and Group C flame arrestors, considered to be representative of the product line as described in paragraph 1.2, was examined, tested, and compared to the manufacturer's drawings. All data is on file at Factory Mutual Research along with other documents and correspondence applicable to this program.

4.2 **Explosionproof Tests** - The following tests verify the suitability of the Series 2020 and 3020 Analyzers as explosionproof for Class I, Division 1, Groups B, C, and D hazardous locations. Option suffix *FACD* is limited to Group C and D applications.

4.2.1 **Impact Tests** - Impact tests were waived as the enclosure is currently NRTL Listed for Class I, Division 1, Groups B, C, and D; and is applied within the limits of that Listing.

4.2.2 **Explosion Pressure Tests** - Additional explosion pressure testing was waived as the enclosure employed is currently NRTL Listed for Class I, Division 1, Groups B, C, and D; and is applied within the limits of that Listing.

## VI FACILITIES AND PROCEDURES AUDIT

The design and manufacturing facilities in City of Industry, CA are subject to routine follow-up inspections. The facilities and quality control procedures in place have been found to be sufficient to manufacture product identical to that tested and Approved.

## VII MANUFACTURER'S RESPONSIBILITIES

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

7.2 On 100% of production, dielectric strength tests shall be performed. A voltage potential of at least 1350 Vac or 1900 Vdc shall be applied to each of the circuits as described below. The tests shall be performed by raising the test voltage to its specified value within 2 seconds, and maintaining it for at least 2 seconds. In no case there shall there be insulation breakdown.

- The power inputs (Mains, L/N) tied together and the enclosure.
- The power inputs (Mains, L/N) tied together and all relay circuit terminals tied together.

WARNING: The dielectric tests 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.

7.3 On 100% of production, the manufacturer shall conduct a visual inspection of the protective grounding system.

## VIII CONCLUSION

Teledyne Analytical Instruments Series 2020 and 3020 Gas Analyzers, as herein described, meet Factory Mutual Research Approval requirements. Approval is effective when the Approval Agreement is signed and received by Factory Mutual Research.

## IX CRITICAL DOCUMENT LIST

The following drawings describe the Series 2020 & 3020 Gas Analyzers and are filed under J.I. 1D4A7.AE .

<b>Drawing</b>	<b>Revision</b>	<b>Title</b>
A-69183	1	SPECIFICATION CONTROL DRAWING
A-69185	1	TAG DETAIL
A-70882	0	SPECIFICATION - FLAME ARRESTOR
A-71540	0	HIGH VOLTAGE COMPONENTS
B-65915	1	VALVE WIRE ASSY

Factory Mutual Research  
JOB IDENTIFICATION 1D4A7.AE

REPORT BY:



William G. Lawrence  
Senior Engineer, Electrical Section

REPORT REVIEWED BY:



Roger P. Lutfy  
Electrical Section Manager