

CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** FM18US0304
3. **Equipment:** Series FALCO 300 / FALCO 600
(Type Reference and Name) Hydrocarbon Abatement Systems
4. **Name of Listing Company:** Falmouth Products, Inc.
5. **Address of Listing Company:** 530 Thomas B. Landers Road
Falmouth MA 02541
USA
6. The examination and test results are recorded in confidential report number:

2B2A6.AE dated 14th November 1997
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

FM Class 3600:2018, FM Class 3611:2018, FM Class 3615:2018, FM Class 3810:2005
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.
10. **Equipment Ratings:**

(see next page)

Certificate issued by:



J.E. Marquedant
VP, Manager, Electrical Systems

21 November 2018

Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
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SCHEDULE



US Certificate Of Conformity No: FM18US0304

FALCO 300 Hydrocarbon Abatement System

FALCO 300 Catalytic Oxidizer

FM18US0304

The electric catalytic oxidizer is suitable for use in a Class I, Division 2, Group D, T2C location extending up to 41 inches above the ground. Portions of the oxidizer located outside of this area are only suitable for unclassified locations.

FALCO 300 Blower Package (5.5 HP, 6 HP, 10 HP, 15 HP, 20 HP, 30 HP, or 40 HP)

FM18US0304

XP / I / 2 / D / T2C

FALCO 300 VCV Vapor Control Valve

FM18US0304

NI / I / 2 / D / T3C

Electrical Ratings:

Control Circuit – 120 Vac, 1Ø, 60 Hz, 3 A or 120 Vac, 1Ø, 50 Hz, 3 A

Blower circuit - 230 Vac, 1Ø, 60 Hz, 5.5 HP or 230 Vac, 3Ø, 60 Hz, 10 HP or 230 / 460 Vac, 3Ø, 60 Hz, 15 / 30 HP or 20 / 40 HP or

230 / 415 Vac, 3Ø, 50 Hz, 17 / 30 HP

Heater Circuit – 240 Vac, 1Ø, 60 Hz, 56.5 A or 240 Vac, 3Ø, 60 Hz, 65 A or 480 Vac, 3Ø, 60 Hz, 33 A, or 415 Vac, 3Ø, 50 Hz, 38 A

Hazardous Location Ratings:

The electric catalytic oxidizer is suitable for use in a Class I, Division 2, Group D, T2C location extending up to 41 inches above the ground. Portions of the oxidizer located outside of this area are only suitable for unclassified locations.

The Blower Package is explosionproof for Class I, Division 1, Group D, T2C

The Vapor Control Valve is Nonincendive for Class I, Division 2, Group D, T3C

FALCO 600 Hydrocarbon Abatement System

FALCO 600 Catalytic Oxidizer

FM18US0304

The electric catalytic oxidizer is suitable for use in a Class I, Division 2, Group D, T2C location extending up to 30 inches above the ground. Portions of the oxidizer located outside of this area are only suitable for unclassified locations.

FALCO 600 Blower Package (15 HP, 20 HP, or 40 HP)

FM18US0304

XP / I / 2 / D / T2C

FALCO 600 VCV Vapor Control Valve

FM18US0304

NI / I / 2 / D / T3C

Electrical Ratings:

Control Circuit – 120 Vac, 1Ø, 60 Hz, 3 A or 120 Vac, 1Ø, 50 Hz, 3 A

Blower circuit - 230 / 460 Vac, 3Ø, 60 Hz, 15 HP / 20 HP / 40 HP or 230 / 415 Vac, 3Ø, 50 Hz, 25 / 40 HP

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Heater Circuit – 240 Vac, 3Ø, 60 Hz, 83 A or 460 Vac, 3Ø, 60 Hz, 42 A, or 415 Vac, 3Ø, 50 Hz, 50 A

Hazardous Location Ratings:

The electric catalytic oxidizer is suitable for use in a Class I, Division 2, Group D, T2C location extending up to 30 inches above the ground. Portions of the oxidizer located outside of this area are only suitable for unclassified locations.

The Blower Package is explosionproof for Class I, Division 1, Group D, T2C

The Vapor Control Valve is Nonincendive for Class I, Division 2, Group D, T3C

11. The marking of the equipment shall include:

See Section 10, Equipment ratings

12. **Description of Equipment:**

The Electric Catalytic Oxidizer is used at hydrocarbon abatement sites to convert hydrocarbon contaminants to carbon dioxide and water. Combustion of the stream occurs within a catalyst in the temperature range of 300°C to 620°C. Once brought up to the reactive temperature by means of an electric heater, the process can become self-sustaining when heat is transferred from the hot exhaust stream to the incoming contaminated air, heating it to the catalytic oxidation temperature. The electric heater, the hydrocarbon content of the stream (controlled by dilution), and the bypass of the stream around the heat exchanger are used to keep the process within the temperature limits required for the reaction and keep the heat exchanger surface temperature below the autoignition temperature of the vapors in the hazardous (classified) location.

The central portion of the FALCO 300 system is the heat exchanger/catalyst (combustion chamber) and the system electrical controls. The heat exchanger/catalyst assembly is a roughly 16" diameter assembly approximately 36" high. The internal space of this assembly is considered to be a Class I, Division 1, Group D location. The heat exchanger/catalyst assembly contains; 1) electric heater used to bring the hydrocarbons to the reactive temperature, 2) three thermocouples used to control the heater and VCV Vapor Control Valve which in turn control the operating temperatures, 3) the catalyst, 4) a heat exchanger bypass valve, and 5) an attached flame arrestor in the sample inlet line. The electrical control enclosure is located on the same skid as the heat exchanger/catalyst assembly, but is located above and outside of the Class I, Division 2 location and is not suitable for use in a hazardous location. The electrical control enclosure contains 1) the field wiring terminals, 2) the temperature limit controllers, 3) the electric heater controller, and 4) the blower package motor controller. In order to limit the surface temperatures at the base of the unit, a 'pie-tin' like heat baffle is employed. The internal space of the 'pie-tin' is an explosionproof compartment packed with thermal insulation to lower the outer surface temperature of its surface.

The FALCO 600 is similar to the FALCO 300, but with twice the flow capacity. The system consists of the treatment vessel, the blower package, and the system electrical controls. The treatment vessel is roughly 31" in diameter and approximately 66" high. The internal space of this assembly contains flammable vapors during operation. The treatment vessel contains; 1) electric heaters used to bring the introduced hydrocarbons to the reactive temperature, 2) three thermocouples used to control the heater, bypass valve, and VCV which in turn control the operating temperatures once the reactive temperature is reached, 3) the catalyst, 4) a heat exchanger bypass valve, and 5) an attached flame arrestor in the vapor inlet line. The electrical control

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enclosure is located on the same skid as the heat exchanger/combustion chamber, but is located above and outside of the Class I, Division 2 location and is not suitable for use in a hazardous (classified) location. The electrical control enclosure contains 1) the field wiring terminals, 2) the temperature limit controllers, 3) the electric heater controller, and 4) the blower motor controller.

The VCV Vapor Valve Control for either system is located in the contaminated air-stream input and is suitable for use in a Class I, Division 2, Group D location. The VCV consists of a small induction motor (used to operate a control valve to regulate the amount of air used to dilute the contaminated air-stream so that the hydrocarbons do not overwhelm the catalyst) and an electronic control system to control the motor.

13. Specific Conditions of Use:

None

14. Test and Assessment Procedure and Conditions:

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. Schedule Drawings

A copy of the technical documentation has been kept by FM Approvals.

16. Certificate History

Details of the supplements to this certificate are described below:

Date	Description
14 th November 1997	Original Issue.
21 st November 2018	<u>Supplement 08:</u> Report Reference: – 2B2A6AE – RR216353 dated 21 st November 2018. Description of the Change: Add 15 HP Blower Package for FALCO 600, update components to add alternates.

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