

CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**

2. **Certificate No:** FM18US0075X
3. **Equipment:** VEGAMIP Series, Microwave Level Detector
(Type Reference and Name)
4. **Name of Listing Company:** VEGA Grieshaber KG
5. **Address of Listing Company:** Am Hohenstein 113
D-77761 Schiltach, Baden-Wuerttemberg
Germany

6. The examination and test results are recorded in confidential report number:
3040888 dated 22nd December 2011

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

FM Class 3600:1998, FM Class 3810:2005,
ANSI/IEC 60529:2004, NEMA 250:1991

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:**

In type of protection dust-ignitionproof equipment, the level detector (VEGAMIP Series) equipment is certified to the following classification(s).

Dust-ignitionproof equipment for use in Class II, Division 1, Groups E, F and G; Class III, Division 1, hazardous (classified) locations; and ordinary (unclassified) locations with an ambient temperature rating of -40 °C to +60 °C, indoor and outdoor (Type 4X; IP66, IP67) environments.

Certificate issued by:

J.E. Marquedant
VP, Manager, Electrical Systems

18 March 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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to US Certificate Of Conformity No: FM18US0075X

11. The marking of the equipment shall include:

In type of protection dust-ignitionproof equipment, the level detector (VEGAMIP Series) equipment is labelled with the following marking(s).

Suitable for Cl II, Div 1, Gp E, F, G, Cl III T6

Ta = -40 °C to +60 °C

Type 4X; IP66/IP67

12. **Description of Equipment:**

General – The VEGAMIP level detector is designed for industrial and hazardous (classified) location applications. The microwave barriers of the VEGAMIP series are suitable for non-contact point level detection of liquids and bulk solids of any kind. It is intended to be used as a universal level detector in all liquids, and is suitable for applications with process temperatures up to +80 °C (+450 °C with mounting adapter) and high process pressures up to 400 kPa (58 psig).

The microwave barrier works like a light barrier: if the microwave beam between transmitter and receiver is blocked by the rising medium, the measuring signal is damped. This change is detected by the receiver and converted into a switching signal.

Construction – The compact version of the level detector is constructed from one of three different single chamber enclosure versions, each of which is permanently attached directly to the emitting unit and the receiving unit of the microwave barrier sensor element.

The single chamber enclosure versions is comprised of aluminum with metric or NPT threaded hubs and a threaded mating cover; or special color aluminum with metric or NPT threaded hubs and a threaded mating cover; or stainless steel casting with metric or NPT threaded hubs and a threaded mating cover.

The base chassis of the aluminum and stainless steel casting enclosures includes a lid lock for the single chamber enclosure version. Only the single chamber aluminum and stainless steel enclosures with an integral cover locking screw are of suitable construction for explosionproof/flameproof enclosure type of protection.

For the various enclosure designs by unscrewing the enclosure cover, the connection terminals to the signal and supply circuit are accessible.

Furthermore, there are holes to contact the parameterization bushing of the electronics inserts mounted on digital part behind the cover. There are two M20 x 1.5 metric or 1/2 inch NPT cable entries in the bottom of the enclosure; one of which is sealed with a certified cable gland, where permitted, or rigid conduit, and the other is sealed with a certified blanking plug. Each of the single chamber enclosures is equipped with an internal and external earthing terminal. The signal and supply circuits are electrically isolated from elements that may be earthed, while the metal elements of the vibration level switch are electrically connected to earth terminals.

The electronics assembly of the non-contact point level detector is constructed from one of two designs.

The electronics assembly of the vibration level switch is constructed from one of two designs. The MPR61-R indicates the electronics version for the relay (DPDT) design switches. The MPR61-T indicates the electronics version for the transistor (NPN/PNP) design switches. The MPT61 is the transmitter unit.

For more specifics concerning construction and description details of the level detector, reference the manufacturer's sales literature and specification sheets.

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Ratings – The equipment is certified to the following ratings.

The ambient operating temperature range is -40 °C to +60 °C in type of protection dust-tight enclosure; each when properly mounted and installed.

The equipment is designated for installation transient overvoltages up to levels of overvoltage category III, and environmentally classified as pollution degree 2.

The process temperature range of the media is -40 °C to +80 °C (+450 °C with mounting adapter, each depending on the process fitting, with a maximum working pressure range of -0.1 to 400 kPa (-14.5 to 58 psig) within a maximum measuring range of 100 mm.

In type of protection dust-ignitionproof equipment, the level detector (VEGAMIP Series with built-in electronics insert MPR61) equipment is connected to limited output Class 2 circuits and power source with the following nominal external supply values.

VEGAMIP T61 – Emitting unit:

V_{max} (U) = 20-253 VAC, 50/60 Hz, P_i = 2 VA maximum

V_{max} (U) = 20-72 VDC, P_i = 0.8 W maximum

U_m = 253 V maximum

VEGAMIP R61 – Relay version:

V_{max} (U -Load) = 20-253 VAC, 50/60 Hz, P_i (P -Load) = 8 VA

V_{max} (U -Load) = 20-72 VDC, P_i (P -Load) = 1.5 W

Switching voltage min. 10 mV, max. 253 VAC/VDC

Switching current min. 10 μ A, max. 3 A (AC), 1 A (DC)

Breaking capacity min. 50 mW, max. 750 VA (AC), 54 W (DC)

VEGAMIP R61 – Transistor version:

V_{max} (U) = 20-55 VDC, P_i = 0.8 W maximum

U_m = 253 V maximum

Load current < 400 mA

Voltage loss < 0.5 V

Switching voltage < 55 VDC

Blocking current < 10 μ A

Model Codes – The equipment is identified with the following model code structure.

In type of protection dust-ignitionproof equipment, the level detector (VEGAMIP Series) equipment is designated with the following model code(s).

VEGAMIP MPR61.GXabcdef, Microwave Receiver for Level Detection.

a = Version: A, B, C, D, E, F, J, N, R, V or X

b = Process Connection/Fitting: XC (170 mm mounting strap), XD (300 mm mounting strap), XX (without compression flange) or two digit alphanumeric variable for connections, which represents a ASME, DIN, G, LA, NPT or TRI-CLAMP industry type flange, with pressure ratings and any type which comply with an international or national standard

c = Process Temperature Code: 1, 2, 3, 4, 8 or 9

d = Electronics: R or T

e = Housing Type: A or V

f = Cable Entry: M or N

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VEGAMIP MPT61.GXabcdef, Microwave Emitter for Level Detection.

- a = Version: A, B, C, D, E, F, J, N, R, V or X
b = Process Connection/Fitting: XC (170 mm mounting strap), XD (300 mm mounting strap), XX (without compression flange) or two digit alphanumeric variable for connections, which represents a ASME, DIN, G, LA, NPT or TRI-CLAMP industry type flange, with pressure ratings and any type which comply with an international or national standard
c = Process Temperature Code: 1, 2, 3, 4, 8 or 9
d = Electronics: T
e = Housing Type: A or V
f = Cable Entry: M or N

13. **Specific Conditions of Use:**

In type of protection dust-ignitionproof equipment, the level detector (VEGAMIP Series) equipment is designated with the following specific conditions of use.

1. Potential Electrostatic Charging Hazard – To prevent the risk of electrostatic sparking, the non-metallic surface should only be cleaned with a damp cloth.
2. Enclosures containing aluminum constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. The level detector shall be installed in such a way that contact between the measuring sensor and the tank wall will be excluded with sufficient safety, considering the tank installations and the flow conditions inside the tank.
4. The maximum permitted ambient temperature of the level detector is +60 °C. To avoid the effects of process temperatures and other thermal effects, care shall be taken to ensure the surrounding ambient temperature and the ambient temperature inside the equipment enclosure does not exceed +60 °C. Adherence to the manufacturer's installation manual must be followed for fulfillment of this requirement.

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
22 nd December 2011	Original Issue.
18 th March 2018	<u>Supplement 1:</u> Report Reference: RR212698, dated 18 th March 2018. Description of the Change: Transfer of c<FM>us Certificate of Conformity ownership (1B6A5.AE, 3016989, 3019326, 3023221, 3027256, 3040888, 3043081, 3044145). Design control update – the actual change is made to the entire certificate and the full document is issued to the holder.

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CERTIFICATE OF CONFORMITY



1. HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS
2. Certificate No: FM18CA0036X
3. Equipment: VEGAMIP Series, Microwave Level Detector
(Type Reference and Name)
4. Name of Listing Company: VEGA Grieshaber KG
5. Address of Listing Company: Am Hohenstein 113
D-77761 Schiltach, Baden-Wuerttemberg
Germany
6. The examination and test results are recorded in confidential report number:
3040888 dated 22nd December 2011
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

CAN/CSA-C22.2 No. 25:1992, CAN/CSA-C22.2 No. 94:1991,
CAN/CSA-C22.2 No. 60529:2005, CAN/CSA-C22.2 No. 61010-1:2004

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:

In type of protection dust-tight enclosure, the level detector (VEGAMIP Series) equipment is certified to the following classification(s).

Dust-tight equipment for use in Class II, Division 1, Groups E, F and G; Class III, Division 1, hazardous (classified) locations; and ordinary (unclassified) locations with an ambient temperature rating of -40 °C to +60 °C, indoor and outdoor (Type 4X; IP66, IP67) environments.

Certificate issued by:

J. E. Marquedant
VP, Manager, Electrical Systems

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SCHEDULE



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The microwave barrier works like a light barrier: if the microwave beam between transmitter and receiver is blocked by the rising medium, the measuring signal is damped. This change is detected by the receiver and converted into a switching signal.

Construction – The compact version of the level detector is constructed from one of three different single chamber enclosure versions, each of which is permanently attached directly to the emitting unit and the receiving unit of the microwave barrier sensor element.

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For the various enclosure designs by unscrewing the enclosure cover, the connection terminals to the signal and supply circuit are accessible.

Furthermore, there are holes to contact the parameterization bushing of the electronics inserts mounted on digital part behind the cover. There are two M20 x 1.5 metric or 1/2 inch NPT cable entries in the bottom of the enclosure; one of which is sealed with a certified cable gland, where permitted, or rigid conduit, and the other is sealed with a certified blanking plug. Each of the single chamber enclosures is equipped with an internal and external earthing terminal. The signal and supply circuits are electrically isolated from elements that may be earthed, while the metal elements of the vibration level switch are electrically connected to earth terminals.

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The equipment is designated for installation transient overvoltages up to levels of overvoltage category III, and environmentally classified as pollution degree 2.

The process temperature range of the media is $-40\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$ ($+450\text{ }^{\circ}\text{C}$ with mounting adapter, each depending on the process fitting, with a maximum working pressure range of -0.1 to 400 kPa (-14.5 to 58 psig) within a maximum measuring range of 100 m .

In type of protection dust-ignitionproof equipment, the level detector (VEGAMIP Series with built-in electronics insert MPR61) equipment is connected to limited output Class 2 circuits and power source with the following nominal external supply values.

VEGAMIP T61 – Emitting unit:

$V_{\text{max}} (U) = 20\text{-}253\text{ VAC}$, $50/60\text{ Hz}$, $P_i = 2\text{ VA}$ maximum

$V_{\text{max}} (U) = 20\text{-}72\text{ VDC}$, $P_i = 0.8\text{ W}$ maximum

$U_m = 253\text{ V}$ maximum

VEGAMIP R61 – Relay version:

$V_{\text{max}} (U\text{-Load}) = 20\text{-}253\text{ VAC}$, $50/60\text{ Hz}$, $P_i (P\text{-Load}) = 8\text{ VA}$

$V_{\text{max}} (U\text{-Load}) = 20\text{-}72\text{ VDC}$, $P_i (P\text{-Load}) = 1.5\text{ W}$

Switching voltage min. 10 mV , max. 253 VAC/VDC

Switching current min. $10\text{ }\mu\text{A}$, max. 3 A (AC) , 1 A (DC)

Breaking capacity min. 50 mW , max. 750 VA (AC) , 54 W (DC)

VEGAMIP R61 – Transistor version:

$V_{\text{max}} (U) = 20\text{-}55\text{ VDC}$, $P_i = 0.8\text{ W}$ maximum

$U_m = 253\text{ V}$ maximum

Load current $< 400\text{ mA}$

Voltage loss $< 0.5\text{ V}$

Switching voltage $< 55\text{ VDC}$

Blocking current $< 10\text{ }\mu\text{A}$

Model Codes – The equipment is identified with the following model code structure.

In type of protection dust-tight enclosure, the level detector (VEGAMIP Series) equipment is designated with the following model code(s).

VEGAMIP MPR61.GXabcdef, Microwave Receiver for Level Detection.

a = Version: A, B, C, D, E, F, J, N, R, V or X

b = Process Connection/Fitting: XC (170 mm mounting strap), XD (300 mm mounting strap), XX (without compression flange) or two digit alphanumeric variable for connections, which represents a ASME, DIN, G, LA, NPT or TRI-CLAMP industry type flange, with pressure ratings and any type which comply with an international or national standard

c = Process Temperature Code: 1, 2, 3, 4, 8 or 9

d = Electronics: R or T

e = Housing Type: A or V

f = Cable Entry: M or N

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13. **Specific Conditions of Use:**

In type of protection dust-tight enclosure, the level detector (VEGAMIP Series) equipment is designated with the following specific conditions of use.

1. Potential Electrostatic Charging Hazard – To prevent the risk of electrostatic sparking, the non-metallic surface should only be cleaned with a damp cloth.
2. Enclosures containing aluminum constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. The level detector shall be installed in such a way that contact between the measuring sensor and the tank wall will be excluded with sufficient safety, considering the tank installations and the flow conditions inside the tank.
4. The maximum permitted ambient temperature of the level detector is +60 °C. To avoid the effects of process temperatures and other thermal effects, care shall be taken to ensure the surrounding ambient temperature and the ambient temperature inside the equipment enclosure does not exceed +60 °C. Adherence to the manufacturer's installation manual must be followed for fulfillment of this requirement.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

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:

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22 nd December 2011	Original Issue.
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