Safety Instructions
VEGACAL 62, 63, 64, 65, 66

FM16US0401X

Installation control diagram

GE 3890

Document ID: 42328

WARNINGS

Special Condition for use:

1. Process Oxygen concentration no greater than 21 % by volume Process pressure no greater than 110 kPa (1.1 bar).

2. Process temperature no greater than 60 °C.

3. The electrode capacitance between the Sensor and Vessel is not to exceed 3.6 µF.

SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR DIVISION 1&2.

EXPLOSION HAZARD: DO NOT REMOVE OR REPLACE WHILE CIRCUIT IS LIVE WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

DO NOT DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE IS PRESENT.

Editing status: 2018-01-08

CERTIFICATE OF CONFORMITY

FM Approvals

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM16US0401X**
3. **Equipment:** (Type Reference and Name) **VEGACAL 60 Series Level Transmitter**
4. **Name of Listing Company:** **Vega Griehsaber KG**
5. **Address of Listing Company:** **Am Hohenstein 113 Schiltach D-77761 Germany**
6. The examination and test results are recorded in confidential report number:

   3033956 dated 11th November 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 3600:2011, FM Class 3610:2010, FM Class 3611:2004, FM Class 3615:2006, FM Class 3616:2011, FM Class 3810:2005, ANSI/ISA 60079-0:2009, ANSI/ISA 60079-11:2009, ANSI/ISA 61010-1:2004, ANSI/NEMA 250:2003, ANSI/IEC 60529:2004
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.

Certificate issued by:

J.E. Marquedant
Manager, Electrical Systems

9 February 2017
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

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10. Equipment Ratings:

I. IS Version

Intrinsically Safe Apparatus for use in Class I, II & III, Division 1, Groups A, B, C, D, E, F & G, in accordance with manufacturer's Control Drawing GE2574; Intrinsically Safe Apparatus AEx ia for use in Class I, Zone 0, Group IIC, in accordance with manufacturer's Control Drawing GE2574; Dust-Ignitionproof Apparatus for use in Class II & III, Division 1, Groups E, F & G; Nonincendive Apparatus for use in Class I, Division 2, Groups A, B, C & D; Dust-Protected Apparatus for use in Class II, Division 2, Groups E, F & G; Fiber & Flying Protection for use in Class III, Division 2, Groups E, F & G; Nonincendive for use in Class I, Zone 2, Group IIC hazardous (classified) locations, Type 4X/6P, and IP66.

II. XP-AIS Version

Associated Apparatus with Intrinsically Safe Connections for use in Class I, II & III, Division 1, Groups A, B, C, D, E, F & G, in accordance with manufacturer's Control Drawing GE2916; Associated Apparatus AEx [ia] with Intrinsically Safe Connections for use in Class I, Zone 0, Group IIC, in accordance with manufacturer's Control Drawing GE2916; Explosionproof Apparatus with Intrinsically Safe Connections for use in Class I, Division 1, Groups A, B, C & D, as well as Class I, Zone 1, Group IIC in accordance with manufacturer's Control Drawing GE2916; Dust-Ignitionproof Apparatus with Intrinsically Safe Connections for use in Class II & III, Division 1, Groups E, F & G, in accordance with manufacturer's Control Drawing GE2916; Dust-Ignitionproof Apparatus for use in Class II & III, Division 1, Groups E, F & G; Nonincendive Apparatus for use in Class I, Division 2, Groups A, B, C & D; Dust-Protected Apparatus for use in Class II, Division 2, Groups E, F & G; Fiber & Flying Protection for use in Class III, Division 2, Groups E, F & G; Nonincendive for use in Class I, Zone 2, Group IIC hazardous (classified) locations, Type 4X/6P, and IP66.

III. DIP & NI Version

Nonincendive Apparatus for use in Class I, Division 2, Groups A, B, C & D; Dust-Ignitionproof Apparatus for use in Class II & III, Division 1, Groups E, F & G; Dust-Protected Apparatus for use in Class II, Division 2, Groups E, F & G; Fiber & Flying Protection for use in Class III, Division 2, Groups E, F & G; Nonincendive for use in Class I, Zone 2, Group IIC hazardous (classified) locations, Type 4X/6P, and IP66.

11. The marking of the equipment shall include:

I. IS Version

Intrinsically Safe, CL I,II,III, Div 1 GP ABCDEFG CL I, ZN 0, AEx ia IIC T6@60°C
Installation per Dwg GE2574
IP66, Type 4X/6P
WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CL I, DIV 2 AND INTRINSIC SAFETY
COATING/PLASTIC PARTS - AVOID ELECTROSTATIC DISCHARGE

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II. XP-AIS Version

CL I, DIV 1, GP ABCD, CL I, ZN 1, GP IIC, T6@60°C
Associated Apparatus for CL I,II,III Div 1 GP ABCDEFG, CL I, ZN 0, AEx [ia] IIC per Dwg. GE2916
IP66, Type 4X/6P
WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR
CL I, DIV 2 AND INTRINSIC SAFETY
DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
SEAL ALL CONDUITS WITHIN 18 INCHES
COATING/PLASTIC PARTS - AVOID ELECTROSTATIC DISCHARGE

III. DIP & NI Version**

CL I Div 2 GP ABCD, CL II Div 1 GP EFG, CL III, CL I, ZN 2, GRP IIC T6...T1 Ta= -40...+60°C
IP66, Type 4X/6P*
WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR
CL I, DIV 2
DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
SEAL ALL CONDUITS WITHIN 18 INCHES

Notes:
* Type 6P rating is available only for "Housing/Protection" model codes 8, A, D, K and V

** Non-Incendive for Class I Div 2 and Zone 2 is available only for the "Indicator Control Module (PLICSCOM)" model codes A, B, and X.

12. **Description of Equipment:**

General - The VEGACAL 60 Series Capacitive Level Transmitters are designed for continuous level measurements in industrial applications. The VEGACAL's sensor and the vessel on which the VEGACAL is mounted form the two electrodes of a capacitor. The process medium level change in the vessel generates a capacitance change measured between VEGACAL's sensor and the vessel wall. This capacitance change is converted in the VEGACAL's processing electronics into a continuous 4 to 20 mA, HART, FISCO, FIELDBUS, or PROFIBUS communications signal.

Construction - The VEGACAL 60 Series consist of one or two encapsulated electronics inserts assembled in a single or double-chambered housing. The PLICSCOM internal display is an optional additional electronics insert that attaches to the main electronics insert, can be mounted on the top, as the standard enclosure, or on the front of the double chamber enclosure, and allows for direct control and observation of the equipment. The housings are constructed out of polycarbonate, Stainless Steel, or Aluminum. All versions of the enclosure provide two options for covers: one with a window for the PLICSCOM internal display; and the standard solid cover without a window. The standard enclosure contains a single cover on the top, while the double chamber enclosure contains a cover on the top for the electronics and an additional cover mounted on the front that covers the wiring compartment. All enclosures include either two ½ NPT or two M20 metric threaded entries that allow the equipment to be wired in accordance with applicable installation requirements.

Ratings - For the VEGACAL 60 Series models with Intrinsically Safe and Non-Incendive ratings, refer to the

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manufacturer's installation drawings GE2574 or GE2916. For explosionproof and dust-ignitionproof models, the electronics are rated for different ranges depending on the model code. The two-wire HART electronics options are rated for 12...36 VDC, 4...22 mA. The fieldbus and profibus options are rated for 9...32 VDC with superimposed Fieldbus or Profibus communication signal respectively.

I. IS Version

VEGACAL 62. CL62UFabcdefg, Level Measuring Equipment

a = Version/Process temperature: A, B, C, D, I or J
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: 8, A, D or V
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): A, B or X
g = Additional equipment: X

VEGACAL 63. CL63UFabcdefg, Level Measuring Equipment

a = Version/Process temperature: E, F, G, H, I or J
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: 8, A, D or V
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): A, B or X
g = Additional equipment: X

VEGACAL 64. CL64UFabcdefg, Level Measuring Equipment

a = Version/Process temperature: R
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: 8, A, D or V
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): A, B or X
g = Additional equipment: X

VEGACAL 65. CL65UFabcdefg, Level Measuring Equipment

a = Version/Process temperature: 1, 2, K, L, O, Q, S, T, U, V or Y
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: 8, A, D or V
e = Cable entry/Cable gland/Plug connection: M or N
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g = Additional equipment: X

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US Certificate Of Conformity No: FM16US0401X

VEGACAL 66. CL66UFabcdefg, Level Measuring Equipment

a = Version/Process temperature: 3 or N
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: 8, A, D or V
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): A, B or X
g = Additional equipment: X

II. XP-AIS Version

VEGACAL 62. CL62UGabcdefg, Level Measuring Equipment

a = Version/Process temperature: A, B, C, D, I or J
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: D
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): A, B or X
g = Additional equipment: X

VEGACAL 63. CL63UGabcdefg, Level Measuring Equipment

a = Version/Process temperature: E, F, G, H, I or J
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: D
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): A, B or X
g = Additional equipment: X

VEGACAL 64. CL64UGabcdefg, Level Measuring Equipment

a = Version/Process temperature: R
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: D
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): A, B or X
g = Additional equipment: X

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VEGACAL 65. CL65UGabcdefg, Level Measuring Equipment

a = Version/Process temperature: 1, 2, K, L, O, Q, S, T, U, V or Y
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: D
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): A, B or X
g = Additional equipment: X

VEGACAL 66. CL66UGabcdefg, Level Measuring Equipment

a = Version/Process temperature: 3 or N
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: D
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): A, B or X
g = Additional equipment: X

III. DIP & NI Version

VEGACAL 62. CL62UXabcdefg, Level Measuring Equipment

a = Version/Process temperature: A, B, C, D, I or J
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: 6, 8, A, D, K or V
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): X, A, B, K, U, L, S or F
g = Additional equipment: X

VEGACAL 63. CL63UXabcdefg, Level Measuring Equipment

a = Version/Process temperature: E, F, G, H, I or J
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: 8, A, D or V
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): X, A, B, K, U, L, S or F
g = Additional equipment: X

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VEGACAL 64. CL64UXabcdefg, Level Measuring Equipment

a = Version/Process temperature: R
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: A, D or V
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): X, A, B, K, U, L, S or F
g = Additional equipment: X

VEGACAL 65. CL65UXabcdefg, Level Measuring Equipment

a = Version/Process temperature: 1, 2, K, L, O, Q, S, T, U, V or Y
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: 8, A, D or V
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): X, A, B, K, U, L, S or F
g = Additional equipment: X

VEGACAL 66. CL66UXabcdefg, Level Measuring Equipment

a = Version/Process temperature: 3 or N
b = Process fitting/Material: Two digit alphanumeric variable for connections which represents a TRI-CLAMP, NPT, LA, G, DN or ASME industry type flange with pressure ratings
c = Electronics: F, H, P or X
d = Housing/Protection: 8, A, D or V
e = Cable entry/Cable gland/Plug connection: M or N
f = Indicating/adjustment module (PLICSCOM): X, A, B, K, U, L, S or F
g = Additional equipment: X

13. **Specific Conditions of Use:**

1. Process Oxygen concentration no greater than 21% by volume.
2. Process pressure no greater than 110 kPa (1.1 bar).
3. Process temperature no greater than 60°C.
4. The electrode capacitance between the sensor and vessel is not to exceed 3.6 µF.

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.

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US Certificate Of Conformity No: FM16US0401X

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
11th November 2011	Original Issue.
9th February 2017	Supplement 2: Report Reference: RR207752 dated 9th February 2017. Description of the Change: Drawing and model code listing changes to incorporate additional "Indicator Control Module (PLICSCOM)" display electronics options K, U, L, S, and F for DIP versions. Temperature and Type ratings have been clarified on the labels and listings. The FM Class 3616:2011 standard was added as the required evaluation was conducted on representative equipment samples with satisfactory results for Project 3045925. Changes do not affect safety nor types of protection as previously evaluated.

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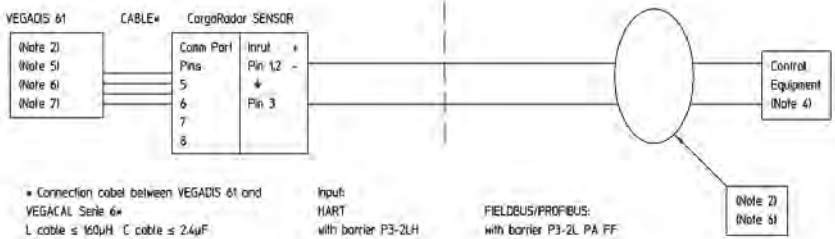
Hazardous (Classified) Location

Unclassified Location

Class I, Division 1 and 2, Groups A, B, C, and D
Class II, Division 1, Groups E, F, and G
Class II, Division 2, Groups F and G
Class III
(Note 3)



* Connection cabel between VEGADIS 61 and VEGACAL Serie 6*
L cable ≤ 160µH C cable ≤ 2.4µF

Input:
HART
with barrier P3-2LH
$U = 14 \ldots 36$ V DC
$U_B = 253$ V AC
with barrier P2-2LH
$U = 20 \ldots 36$ V DC
$U_B = 253$ V AC

FIELDBUS/PROFIBUS:
with barrier P3-2L PA FF
$U = 14 \ldots 32$ V DC
$U_B = 253$ V AC
with barrier P2-2L PA FFD
$U = 20 \ldots 32$ V DC
$U_B = 253$ V AC

Notes:

1. The Intrinsic Safety Entity concept allows the interconnection of two intrinsically safe devices FM Approved and CSA Certified entity parameters not specifically examined in combination as a system when:
   Uo or Voc or Vt ≤ Vmax, Io or Isc or It ≤ Imax, Ca or Co ≥ Ci + Ccable, La or Lo ≥ Li + Lcable, Po ≤ Pi.
2. For Division 2 installations, the Sensor shall be installed in accordance with the National Electrical Code® (ANSI/NFPA 70) or Canadian Electrical Code, CSA C22.1 Part 1 Appendix F for division 2 wiring methods.
3. Dust-light conduit seal shall be used when installed in Class II and Class III environments.
4. For Division 1 installations, Control equipment shall not use or generate more than 250 Vrms or Vdc.
5. Division 1 installations should be in accordance with ANSI/ISA RP12.06.01" Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code® (ANSI/NFPA 70) or Canadian Electrical Code.
6. For Division 1 installations, the terminal marked (⏚) shall be grounded per ANSI/NFPA 70 article 504.50 or CSA C22.1 Part 1 Appendix F F3.2.2 and the Field Device wiring shall be segregated from the supply wiring.
7. For Division 2 installations, the Field Device shall be installed in accordance with the National Electrical Code® (ANSI/NFPA 70) or Canadian Electrical Code, CSA C22.1 Part 1 Appendix F for Division 2 wiring methods insluding Nonincendive Field Wiring when using the parameters shown.
8. For Division 1 Installations the configuration of Field Devise must be FM Approved/CSA Certified under Entity Concept.
9. The Field Device manufacturer's installation drawing shall be followed when installing this equipment.
10. No revision to drawing without prior Approval by FM Approvals and CSA International.
11. Divison 1 installation requirements must be complied with if one or more of the following are located in a Division 1 hazardous location: Sensor, Probe or Field Deverse.
12. Warning- Substitution of components may impair suitability for hazardous locations.

Änderung / revision	
gezeichnet / drawn	15.09.2017 Isenberger
freigegeben / checked	15.09.2017 Heusler
Benennung / Description	INSTALLATION CONTROL DIAGRAM: VEGACAL 6* XP-IS
Art.Nr. / Art.No.	GE3890
Zeichngs-Nr. / Drawing No.	GE3890
Originalformat / size of origin.	A3
Blatt / Sheet	1 von/of 1

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