



Safety instructions

VEGASON 6*(*).KF**H/P/F***

CSA 1681386 (LR 23257)

Installation control diagram GE2158



Document ID: 32574



VEGA

WARNING

**SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2 AND
INTRINSIC SAFETY**

**OPEN CIRCUIT BEFORE REMOVING COVER OR KEEP COVERS TIGHT WHILE CIRCUITS ARE
ALIVE**

1 Certificate



Certificate of Compliance

Certificate: 1681386 **Master Contract:** 153855
Project: 70017758 **Date Issued:** December 11, 2014
Issued to: VEGA Americas, Inc.
 4141 Rosslyn Dr
 Cincinnati, Ohio 45209
 USA
Attention: Nick Ilchovski

The products listed below are eligible to bear the CSA Mark shown



Issued by: Jelena Dzeletovic
 Jelena Dzeletovic

PRODUCTS

CLASS - C2258 02 - PROCESS CONTROL EQUIPMENT-For Hazardous Locations-

Class I, Division 2, Groups A, B, C, and D; Class II, Division 2, Groups F and G; Class III Ex nA IIC T6...T1 Gc

Enclosure types 4X, IP66 (6P for Housing Options K, V or 8 only)
 Rated 4-20 mA, 12-36 Vdc for Electronics Option H and 12-32 Vdc for Electronics Option F or P

- **VEGASON 6a.KXbcdefgh, Level Measuring Equipment**
 - a = Configuration: 1, 2, 1Y, 2Y
 - b = Version: A, B
 - c = Process Connection: Two digit alphanumeric variable for connections, which represents a TRI-CLAMP, NPT, G, DN or ASME industry type flange with pressure ratings
 - d = Electronics: F, H or P
 - e = Housing: A, D, K, V, W or 8
 - f = Cable Entry: M or N
 - g = Indicator Control Module (PLICSCOM): A, B or X
- ** For g = A or B, temperature class is T4 @ Ta = 80°C;
 For g = X, temperature class is T6 @ Ta = 70°C or T5 @ Ta = 80°C



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Class II, Division 1, Groups E, F and G; Class III

Enclosure types 4X, IP66 (6P for Housing Options K, V or 8 only)
 Rated 4-20 mA, 12-36 Vdc for Electronics Option H and 12-32 Vdc for Electronics Option F or P

- **VEGASON 6a KRbdefgh, Level Measuring Equipment**

- a = Configuration: 1, 2, 1Y, 2Y
- b = Version: A, B
- c = Process Connection: Two digit alphanumeric variable for connections, which represents a TRI-CLAMP, NPT, G, DN or ASME industry type flange with pressure ratings
- d = Electronics: F, H or P
- e = Housing: A, D, V, W or 8
- f = Cable Entry: M or N
- g = Indicator Control Module (PLICSCOM): A, B or X

** For g = A or B, temperature class is T4 @ Ta = 80°C;
 For g = X, temperature class is T6 @ Ta = 70°C or T5 @ Ta = 80°C.

CLASS 2258 04 - PROCESS CONTROL EQUIPMENT – Intrinsically Safe, Entity – For Hazardous Locations

Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III T*

Ex ia IIC Ga, T6...T1

Enclosure types 4X, IP66 (6P for Housing Options K, V or 8 only)
 Rated 4-20 mA, 12-36 Vdc for Electronics Option H and 12-26 Vdc for Electronics Option F or P
 Intrinsically safe, with entity parameters, for use in Class I, II, III; Division 1; Groups A, B, C, D, E, F, G and Class I, Zone 0, Group IIC in accordance with manufacturer's Control Drawing No. GE2158;
FISCO Field Device parameters: Ui = 17.5V, Ii = 500mA, Pi = 5.5W, Ci = 0 uF, Li = 0 mH

- **VEGASON 6a.KFbdefgh, Level Measuring Equipment**

- a = Configuration: 1, 2, 1Y, 2Y
- b = Version: A, B
- c = Process Connection: Two digit alphanumeric variable for connections, which represents a TRI-CLAMP, NPT, G, DN or ASME industry type flange with pressure ratings
- d = Electronics: F, H or P
- e = Housing: A, D, K, V, W or 8
- f = Cable Entry: M or N
- g = Indicator Control Module (PLICSCOM): A, B or X

** For g = A or B, temperature class is T4 @ Ta = 80°C;
 For g = X, temperature class is T6 @ Ta = 70°C or T5 @ Ta = 80°C



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APPLICABLE REQUIREMENTS

CAN/CSA Standard C22.2 No. 0-M91 <i>(Reaffirmed 2006)</i>	General Requirements - Canadian Electrical Code, Part II
CSA Standard C22.2 No. 0.4-1982 <i>(Reaffirmed 1999)</i>	Bonding and Grounding of Electrical Equipment (Protective Grounding)
CSA Standard C22.2 No. 0.5-1982 <i>(Reaffirmed 2003)</i>	Threaded Conduit Entries
CSA Standard C22.2 No. 25-1966 <i>(Reaffirmed 2004)</i>	Enclosures for Use in Class II Groups E, F, and G Hazardous Locations
CSA Standard C22.2 No. 30-M1986 <i>(Reaffirmed 2007)</i>	Explosion-Proof Enclosures for Use in Class I Hazardous Locations Industrial Products
CSA Std C22.2 No. 60079-0-11	Explosive atmospheres – Part 0: Equipment – General requirements-Second Edition
CSA Std C22.2 No. 60079-1-11	Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures “d” – Second Edition
CSA Std C22.2 No. 60079-15-10	Electrical apparatus for explosive gas atmospheres – Part 15: Construction, test and marking of type of protection “n” electrical apparatus
CSA Std C22.2 No. 60079-11-6	Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety “i”.
UL Std No. 60079-15-13	Explosive atmospheres – Part 15: Equipment protection by type of protection “n”
CAN/CSA Standard C22.2 No. 94-M91 <i>(Reaffirmed 2006)</i>	Special Purpose Enclosures; Industrial Products
CSA Standard C22.2 No. 142-M1987 <i>(Reaffirmed 2004)</i>	Process Control Equipment Industrial Products
CAN/CSA Standard C22.2 No. 157-92 <i>(Reaffirmed 2006)</i>	Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations
CSA Standard C22.2 No. 213-M1987 <i>(Reaffirmed 2008)</i>	Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
CSA Standard E60079-0:02: 1995 <i>(Reaffirmed 2008)</i>	Electrical Apparatus for Explosive Gas Atmospheres – Part 0: General Requirements
CSA Standard E60079-11:02: 1995	Electrical apparatus for explosive gas atmosphere Part 11: intrinsic safety “i”
IEC 60529: 2001 (w/Amend 1)	Degrees of protection provided by enclosures (IP Code)
IEC 60079-27: 2005	Electrical apparatus for explosive gas atmosphere Part 27: Fieldbus intrinsically safe concept (FISCO) and Fieldbus non-incendive concept (FNICO) – Edition 1 (used as a guide)



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Supplement to Certificate of Compliance

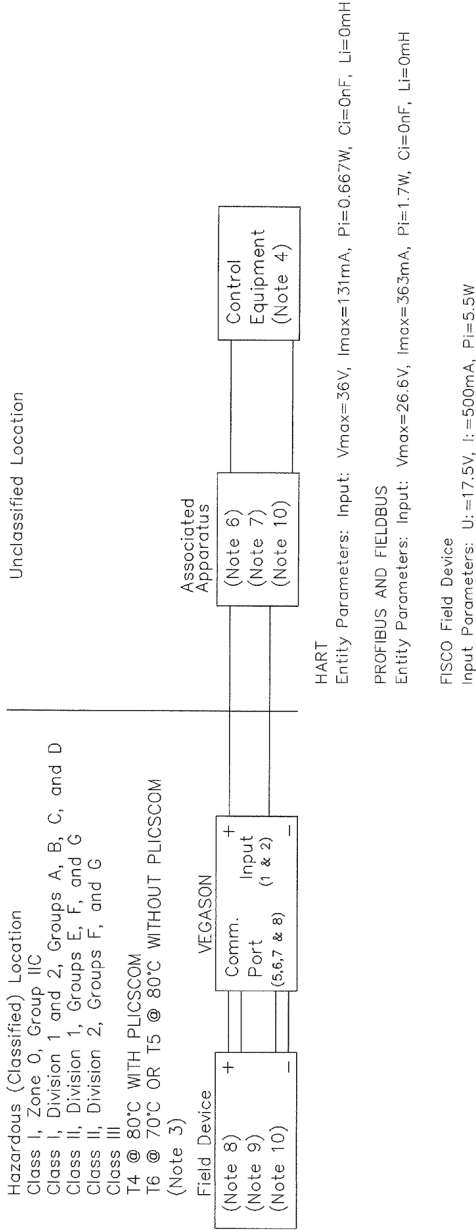
Certificate: 1681386

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The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
70017758	Dec 11 2014	Update to the Report 1681386 to split the currently approved model KX to KX which is non-incendive and for Class II Division 1 with model KR and to include revised drawings.
2716429	May 7 2014	Update to add Yokogawa as a trade name, includes new label drawings, model designation and zone ratings.
2333212	Aug 20 2010	Update to report 1681386 to include a revised version of the PLICSCOM display, the PLICSCOM2. Report revised to use accepted format and reissued.
2147036	Mar 24 2009	Update of Report 1681386 to include revised drawings.
1901421	Aug 8 2007	Revised Construction
1815616	Jan 26 2007	Update to Report 1681386 to add FISCO evaluation
1795184	May 25 2006	Revise models designation code.
1717044	Dec 6 2005	Update to report 1681386 to add Class II, Div 1.
1681386	Sep 23 2005	Original certification of VEGASON as intrinsically safe and suitable for Division 2.



Comm. Port	
$V_{oc}=7.5V$, $I_{sc}=221mA$, $P_o=415mW$	
Groups	Inductance L_a (mH)
IIC/A,B	0.7
IIB/C,E	3.0
IIA/D,F,G	5.7

Notes:

- The Intrinsic Safety Entity concept allows the interconnection of two Intrinsically safe devices FM Approved and CSA Certified when installed in Canada with 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.
- For Division 2 installations, the Associated Apparatus is not required to be FM Approved or CSA Certified when installed in Canada under Entity Concept if the VEGASON 60 Series is 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 excluding Nonincendive field wiring.
- Dust-tight conduit seal shall be used when installed in Class II and Class III environments.
- Control equipment connected to the Associated Apparatus shall not use or generate more than 250 Vrms or Vdc.
- 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.
- For Division 1 installations, the configuration of associated Apparatus shall be FM Approved/CSA Certified under Entity Concept.
- Associated Apparatus manufacturer's installation drawing shall be followed when installing this equipment.
- The configuration of Field Device must be FM Approved/CSA Certified under Entity Concept.
- The Field Device manufacturer's installation drawing shall be followed when installing this equipment.
- The VEGASON 60 Series are FM Approved/CSA Certified for Class I, Zone 0, applications. If connecting AEX[ib] Associated Apparatus or AEX ib I.S. Field Device to the VEGASON 60 Series, the above system is only suitable for Class I, Zone 1, and is not suitable for Class I, Zone 0 or Class I, Division 1, Hazardous (Classified) Locations.
- No revision to drawing without prior Approval by FM Approvals and CSA International.
- Barriers and Instruments to carry same Agency Approval.
- See manual for FISCO requirements.

The FISCO concept allows the interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criterion for such interconnection is that

ECCO NUMBER	SYM	REVISION	BY	CHECKED
1		CHGD. T RATINGS.	T.R.B. 09/25/05	K.G. 09/23/05
2		ADDED NOTE 12	CS 11/03/06	K.G. 11/03/06
3		FISCO PARAMS & NOTE 13	CS 01/02/07	K.G. 01/02/07

OHMART BY/W NUMBER		VE207442
DRAWING NUMBER		GE2158
		4241 Allendorf Drive Cincinnati, Ohio 45209 USA
INSTALLATION CONTROL DIAGRAM: VEGASON 60 FM/CSA DIVISION 1 INSTRUMENTS		
THIS DOCUMENT INCLUDES INFORMATION WHICH IS PROPRIETARY TO OHMART/VEGA CORPORATION. NEITHER THIS DOCUMENT NOR THE CONTENTS HEREOF ARE TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE SPECIFICALLY AUTHORIZED WRITING BY OHMART/VEGA CORPORATION. THIS DOES NOT APPLY TO INFORMATION FURNISHED BY VENDORS OR OTHERS OUTSIDE OHMART/VEGA CORPORATION.		
DRAWN BY/DATE	CHECKED BY/DATE	
T.R.B. 11/03/04	K.G. 11/03/04	B—GE2158

MADE FROM	GE2021
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the voltage (V_{max}), the current (I_{max}) and the power (P_i) which intrinsically safe apparatus can received and remain intrinsically safe, considering faults, must be equal or greater than the voltage (U_o, V_{oc}, V_t), the current (I_o, I_{sc}, I_t) and the power (P_o) which can be provided by the associated apparatus (supply unit). In addition, the maximum unprotected residual capacitance (C_i) and inductance (L_i) of each apparatus (other than the terminators) connected to the Fieldbus must be less than or equal to 5 nF and 10 μ H respectively. In each I.S. Fieldbus segment only one active source, normally the associated apparatus (power supply), is allowed to provide the necessary power for the Fieldbus system.

The associated apparatus (power supply) used to supply the bus shall either be resistive limited or have a trapezoidal or rectangular output characteristic. The maximum output voltage shall be not greater than 17.5 V or less than 14 V.

The maximum output current I_o for any type of power supply shall not exceed 380 mA and the maximum output power P_o shall not exceed 5.32 W.

maximum output power P_o shall not exceed 5.32 W. The power supply may be connected to earth. The apparatus certificate shall state that the power supply is suitable for use in a FISCO system.

All other equipment connected to the bus cable has to be passive, meaning that the apparatus is not allowed to provide energy to the system, except to a leakage current of 50 μ A for each connected device. Separately powered equipment needs a galvanic isolation to insure that the intrinsically safe Fieldbus circuit remains passive.

The cable used to interconnect the devices needs to have the parameters in the following range:

Loop resistance R' : 15 to 150 Ohm/km

Inductance per unit length L' : 0.4 to 1 mH/k

Capacitance per unit length C' : 80 to 200 nF/km

$C' = C' \text{ line/line} + 0.5 C' \text{ conductor/screen}$, if the bus system is balanced (e. g. floating or potential free): or

$C' = C' \text{ conductor/conductor} + C' \text{ conductor/screen}$, if the screen is connected to one pole of supply unit.

At each end of the main bus cable an approved infallible line termination with the following parameters is satisfactory. One of the allowed termination may be integral to the associated apparatus:

Infallible resistor $R = 90$ to 100 Ohms in series a capacitance $C = 2.2 \mu$ F

The power supply shall be located not more than 30 m from one end. Where the power supply is connected via a spur, then that spur is restricted to a length of 30 m. Maximum length of each trunk cable is 1 km.

The number of field devices in a FISCO system is up to 32.



Printing date:

VEGA

All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

Subject to change without prior notice

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