Certificate of Compliance

Certificate: 70191118 **Master Contract:** 153857

Project: 70191118 **Date Issued:** 2018-12-05

Issued to: **Vega Grieshaber KG**
Am Hohenstein 113
Schiltach, Baden-Württemberg 77761
GERMANY

Attention: Martin Schmitt

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: Hossein Saleh
Hossein Saleh

PRODUCTS

CLASS 2258 03 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations
CLASS 2258 83 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations - Certified to U.S. Standards

Class II, Division 1, Groups E, F and G, T135 °C; Class III
Ex ia ta IIIC T135 °C Da
Ex ia/tb IIIC T135 °C Da/Db
Ex ia tb IIIC T135 °C Db
Zone 20, AEx ia ta IIIC T135 °C Da
Zone 20/21, AEx ia/tb IIIC T135 °C Da/Db
Zone 21, AEx ia tb IIIC T135 °C Db

The differential pressure measuring devices type VEGADIF DF85 are used for differential pressure measurement in dust explosive hazardous areas. The differential pressure measuring devices type VEGADIF DF85 consist of an electronics housing, a differential pressure measuring element, and the process connections. Optionally, also the indication and operation module may be installed.

The following electronic versions are available:

VEGADIF DF85(*).*R*****Z******:	2 wire 4 ... 20 mA transmitters
VEGADIF DF85(*).*R*****H******:	2 wire 4 ... 20 mA transmitters with superposed HART signal
VEGADIF DF85(*).*R*****A******:	2 wire 4 ... 20 mA transmitters with superposed HART signal and additional SIL qualification
VEGADIF DF85(*).*R*****U******:	With electronics for MODBUS[1]
VEGADIF DF85(*).*R*****P******:	With electronics for Profibus PA
VEGADIF DF85(*).*R*****F******:	With electronics for Foundation Fieldbus

Nomenclature:

Model Code for VEGADIF DF85(**).a-R-c-d-e-f-g-h-i-j-k-l-m-n

a = Scope: For internal use
b = Approval: R[2], *[2]
c = Process Fitting/Material: One digit variable designating type of process fitting
d = Membrane Material: One digit variable designating the material type of the Membrane
e = Sealing/Material: One digit alphanumeric variable: FKM, EPDM, *
f = Range: One digit variable designating the allowable measurement range of the pressure cell
g = Accuracy class: One digit variable designating the accuracy of the instrument
h = Electronics: Z, H, U[1], A, P, F
i = Additional electronics: X or Z
j = Housing: A, D, V, W, *
k = Housing/Protection: D, N, or M
l = Cable Entry/Connection: O, 2, 6, D, 1, 8, P, Q, N, *
m = Operation and Indication unit PLICSCOM: X, A, K, F, B, L
n = Additional Certificates: One digit variable designating any type of test certificates required by the customer

Note 1 - "U" electronics only suitable for installation in Zone 21.
Note 2 - More markings are possible in case the version is separately certified according to an additional certificate.

Electrical Data:

VEGADIF DF85.*****Z/H/A/U/P/F********

Supply and signal circuit: VEGADIF DF85.*******Z/H/AXA/V**** Terminal 1[+], 2[-] in electronics compartment of the single chamber housing VEGADIF DF85.*******Z/H/AXD/W**** Terminal 1[+], 2[-] in terminal compartment of the double chamber housing	U = 9.6…30 VDC I = 4…22 mA U_m = 30 VDC
VEGADIF DF85.*******Z/H/AZD/W**** Supply and signal circuit I: Terminal 1[+], 2[-] in electronics compartment of the single chamber housing	U= 9.6…30 VDC I = 4…22mA U_m = 30 VDC

Supply and signal circuit II: Terminal 17[+], 18[-] in terminal compartment of the double chamber housing	U= 9.6…30 VDC I = 4…22 mA U_m = 30 VDC
VEGADIF DF85.*******UXD/W****	
Supply and signal circuit I: Terminal 1[+], 2[-] in terminal compartment of the double chamber housing	U= 9.6…30 V DC I = 4…22 mA U_m = 30 VDC
Supply and signal circuit II: Terminal MB[+], MB[-] in terminal compartment of the double chamber housing	U= 5 V DC I = 4…22 mA U_m = 5 VDC MODBUS-telegram
Supply and signal circuit III: 6-pole mini-USB socket in the terminal compartment of the double chamber housing	U= 5 VDC U_m = 5 VDC USB-protocol
Supply and signal circuit: VEGADIF DF85.*******P/FXA/V**** Terminal 1[+], 2[-] in electronics compartment of the single chamber housing VEGADIF DF85.*******P/FXD/W**** Terminal 1[+], 2[-] in terminal compartment of the double chamber housing	U= 9.6…32 VDC I = 4…22 mA U_m = 32 VDC
Display and adjustment circuit: VEGADIF DF85.*******Z/H/A/P/F*A/V**** Terminals 5, 6, 7, 8 in electronics compartment of the single chamber housing VEGADIF DF85.*******Z/H/A/P/F*D/W**** Terminals 5, 6, 7, 8 in terminal compartment of the double chamber housing	Only for connection to the associated VEGA display unit VEGADIS81
Display and adjustment circuit: Spring contacts in terminal / electronics compartment of the single / double chamber housing	Only for connection to the display and adjustment module PLICSCOM.

Thermal Data:

Equipment Protection Level	Process Temperature Range, Tp	Ambient Temperature Range, Ta[3]
Da	-40 … +70 °C	-40 … +70 °C
Da/Db	-40 … +85 °C	
Db	-40 … +70 °C	

Note 3 - The limits of the permissible ambient temperature range may be restricted by the used O-ring material. The permissible temperature ranges in dependence of the material are included in the Safety Instructions.

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Enclosure Rating - IP - Type:

Model	Housing	Electronics	IP	Type
A	Aluminum Single Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P
	Aluminum Single Chamber / IP66/IP68 (1bar)[5]	Z, A, H, P, F	IP66/IP68(1bar)[5]	6P
*[4]	Aluminum Single Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P
	Aluminum Single Chamber / IP66/IP68 (1bar)[5]	Z, A, H, P, F	IP66/IP68(1bar)[5]	6P
D	Aluminum Double Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F, U	IP66/IP68(0.2bar)	6P
*[4]	Aluminum Double Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F, U	IP66/IP68(0.2bar)	6P
V	StSt (Precision Casting) 316L Single Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P
	StSt (Precision Casting) 316L Single Chamber / IP66/IP68 (1bar)[5]	Z, A, H, P, F	IP66/IP68(1bar)[5]	6P
W	StSt (Precision Casting) Double Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F, U	IP66/IP68(0.2bar)	6P

Note 4 – Aluminum in special color: '' can be H, S, or other character.*
Note 5 - Restrictions depending on other models code parameters may be applicable.

Notes:

1. The above model is fixed connection, Pollution Degree 4 (Macro Environment), Pollution Degree 2 (Micro Environment), Overvoltage Category I.
2. Mode of operation: Continuous.
3. Environmental Conditions: Extended, Indoor and outdoor use, Ambient temperature and RH% range depending on the model see manual, altitude up to 5000 m.

Conditions of Acceptability:

1. To be supplied by a Class 2 or Limited Energy Source in accordance with CSA 61010-1-12 or UL 61010-1, Third Edition.
2. The permissible ambient temperature for specified process temperature range depends on the variant of the apparatus (see thermal data).
   The limits of the permissible ambient temperature range may be restricted by the used O-ring material. The used O-ring material is included in the marking. The permissible temperature ranges in dependence of the material are included in the manufacturer's instructions.
3. For functional reasons, the partition wall (membrane) to the wetted area has a wall thickness < 1 mm. In the application, it has to be ensured, that an impairment of the separation wall e.g. by aggressive media or mechanical hazards is excluded.
   For variants with standard process connections:
   The installation of the meter bodies shall provide a minimum degree of protection IP67 according to CSA/ANSI/IEC 60529 for the process connections and vents.
   For variants with capillary connections:
   The capillary connections are designed to be connected to a capillary with diaphragm seal. The filling holes are intended to bring in a fill fluid.
   To prevent a zone entrainment from Zone 20, the diaphragm seal or the diaphragm seal and capillary have to be suitably designed. The pressure transfer system has to be technically tight. The filling hole has to be tightly sealed.
4. At the plastic part there is a danger of ignition by electrostatic discharge. Observe manual of the manufacturer and warning label.

5. At the metallic parts made of light metal there is danger of ignition by impact or friction. Observe manual of the manufacturer.
6. The 3/8" NPT threaded port of the Dual-Chamber housing shall not be used as a field wiring conduit entry and has to be closed at all times with a suitable plug.
7. The cable entries and blanking elements in the housing have to be suitable certified for an operating temperature area of -40°C to +80 °C or the cable entries and blanking elements of the manufacturer have to be used.
8. When cable glands or plugging connections are used their IP and Type rating must meet the installation requirements of CEC, Section 18, and NEC, Section 500 for installation in Zone and Division for methods of protection 'Ex t' and 'Class II / Class III'.
9. End-user shall ensure the device is properly connected to Earth upon installation.

CLASS 2258 04 - PROCESS CONTROL EQUIPMENT- Intrinsically Safe, Entity - For Hazardous Locations
CLASS 2258 84 - PROCESS CONTROL EQUIPMENT- Intrinsically Safe, Entity - For Hazardous Locations - Certified to US Standards

Class I, Division 1, Groups A, B, C and D, T6…T1
Ex ia IIC T6…T1 Ga
Ex ia IIC T6…T1 Ga/Gb
Ex ia IIC T6…T1 Gb
Class I, Zone 0, AEx ia IIC T6…T1 Ga
Class I, Zone 0/1, AEx ia IIC T6…T1 Ga/Gb
Class I, Zone 1, AEx ia IIC T6…T1 Gb

The differential pressure measuring devices type VEGADIF DF85 are used for differential pressure measurement of liquid and gases. The differential pressure measuring devices type VEGADIF DF85 consists of an electronic housing, a differential pressure measuring element, and the process connections. Optionally, also the indication and operation module may be installed.

The following electronic versions are available:

VEGADIF DF85(*).*C*****Z******:	2 wire 4 ... 20 mA transmitters
VEGADIF DF85(*).*C*****H******:	2 wire 4 ... 20 mA transmitters with superposed HART signal
VEGADIF DF85(*).*C*****A******:	2 wire 4 ... 20 mA transmitters with superposed HART signal and additional SIL qualification
VEGADIF DF85(*).*C*****P******:	With electronics for Profibus PA
VEGADIF DF85(*).*C*****F******:	With electronics for Foundation Fieldbus

Connections to the intrinsically safe circuits provided per Control Drawing No. 56992. Other installation information is provided in Safety Instructions 56979.

Nomenclature:

Model Code for VEGADIF DF85(*).a-C-c-d-e-f-g-h-i-j-k-l-m-n

a = Scope: For internal production control, not relevant to explosion protection

b = Approval: C [1], * [1]
c = Process Fitting/Material: One digit variable designating type of process fitting
d = Membrane Material: One digit variable designating the material type of the membrane
e = Sealing/Material: One digit alphanumeric variable: FKM, EPDM, *
f = Range: One digit variable designating the allowable measurement range of the pressure cell
g = Accuracy class: One digit variable designating the accuracy of the instrument
h = Electronics: Z, H, A, P, F
i = Additional electronics: X, Z
j = Housing: A, D, V, 8, W, *
k = Housing/Protection: D, N, or M
l = Cable Entry/Connection: M, K, S, U, T, V, L, 2, D, 1, J, N, Q, C, B, I, F, G, H, W, Z, *
m = Operation and Indication Unit PLICSCOM: X, A, K, F, B, L
n = Additional Certificates: One digit variable designating any type of test certificates required by the customer [1].

Note 1 - More markings are possible in case the version is separately certified according to an additional certificate.

Input Entity Parameters:

1. With Integrated electronics Z or A or H:

V_{max}, U_i	I_{max}, I_i	P_i	C_i	L_i
30 VDC	131 mA	983 mW	Negligibly small	5 µH [2]

Note 2 - For integrated electronics H in combination with double chamber housing and additional electronics PLICSZEKX the L_i value is 10 µH.

2. With Integrated electronics P or F:

FISCO-model	V_{max}, U_i	I_{max}, I_i	P_i	C_i	L_i
	17.5 VDC	500 mA	5.5 W	Negligibly small	5 µH [3]
Entity-model	V_{max}, U_i	I_{max}, I_i	P_i	C_i	L_i
	24 VDC	250 mA	1.2 W	Negligibly small	5 µH [3]

Note 3 - Only in combination with double chamber housing and additional electronics PLICSZEKX, otherwise negligibly small.

Output Entity Parameters:

Only for connection to the associated VEGA display unit VEAGADIS81 according to the certificate 2662675.

1. Electronics Z or H or A:

C_a, C_o	L_a, L_o
1.98 µF	330 µH

2. Electronics P or F:

C_a, C_o	L_a, L_o
1.98 µF	212 µH

Thermal Ratings:

Temperature Codes and Ambient Temperature Ranges suitable for use in Class I, Zone 0, Zone 0/1, Zone 1 and Class I, Division 1 Hazardous Location with all specified housings and electronics are per the table below:

Temperature Code	Process Temperature Range, Tp	Ambient Temperature Range, Ta
T6, T5	-40 … +46 °C	-40…+46 °C
T4, T3, T2, T1	-40 … +85 °C	-40…+80 °C

Enclosure Ratings - IP - Type:

Model	Housing	Electronics	IP	Type
A	Aluminum Single Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P
	Aluminum Single Chamber / IP66/IP68 (1bar)	Z, A, H, P, F	IP66/IP68(1bar)	6P
*[4]	Aluminum Single Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P
	Aluminum Single Chamber / IP66/IP68 (1bar)	Z, A, H, P, F	IP66/IP68(1bar)	6P
D	Aluminum Double Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P
*[4]	Aluminum Double Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P
V	StSt (Precision Casting) 316L Single Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P
	StSt (Precision Casting) 316L Single Chamber / IP66/IP68 (1bar)	Z, A, H, P, F	IP66/IP68(1bar)	6P
W	StSt (Precision Casting) Double Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P
8	StSt (Electro Polished) 316L Single Chamber / IP66/IP68 (0.2bar)	Z, A, H, P, F	IP66/IP68(0.2bar)	6P

Note 4 – Aluminum in special color: '' can be H, S, or other character.*

Notes:

1. The above model is fixed connection, Pollution Degree 4 (Macro Environment), Pollution Degree 2 (Micro Environment), Overvoltage Category I.
2. Mode of operation: Continuous.
3. Environmental Conditions: Extended, Indoor and outdoor use, Ambient temperature and RH% range depending on the model see manual, altitude up to 5000 m.

Conditions of Acceptability:

1. The permissible ambient temperature for specified process temperature range depends on the variant of the apparatus (see thermal data).
   The limits of the permissible ambient temperature range may be restricted by the used O-ring material. The used O-ring material is included in the marking. The permissible temperature ranges in dependence of the material are included in the manufacturer's instructions.
2. For use as Ga/Gb apparatus:

For functional reasons, the partition wall (membrane) to the wetted area has a wall thickness < 1 mm. In the application, it has to be ensured, that an impairment of the separation wall e.g. by aggressive media or mechanical hazards is excluded.
For variants with standard process connections:
The installation of the meter bodies shall provide as minimum degree of protection IP67 according to CSA/ANSI/IEC 60529 for the process connections and vents.
For variants with capillary connections:
The capillary connections are designed to be connected to a capillary with diaphragm seal. The filling holes are intended to bring in a fill fluid.
To prevent a zone entrainment from Zone 0, the diaphragm seal or the diaphragm seal and capillary have to be suitably designed. The pressure transfer system has to be technically tight. The filling hole has to be tightly sealed.

3. At the plastic part there is a danger of ignition by electrostatic discharge. Observe manual of the manufacturer and warning label.
4. At the metallic parts made of light metal there is danger of ignition by impact or friction. Observe manual of the manufacturer.
5. Cable entries and blanking elements in the housing have to be suitable certified for an operating temperature area of -40°C to +80 °C, or the cable entries and blanking elements of the manufacturer have to be used.
6. End-user shall ensure the device is properly connected to Earth upon installation.

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APPLICABLE REQUIREMENTS

Standard Number	Issue Date / Edition	Title
CAN/CSA C22.2 No. 0-10	R2015*	General Requirements - Canadian Electrical Code, Part II
CAN/CSA C22.2 No. 61010-1-12	2012	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1 General Requirements
CAN/CSA C22.2 No. 94.2-15	2015 / 2nd Edition	Enclosures for Electrical Equipment, Environmental Considerations
CAN/CSA C22.2 No. 60529:16	2016 / 2nd Edition	Degrees of protection provided by enclosures (IP Code)
CAN/CSA C22.2 No 25-17	2017 / 4th Edition	Enclosures for Use in Class II, Division 1, Groups E, F and G Hazardous Locations
CAN/CSA C22.2 No. 60079-0:15	2015 / (Ed. 6.0)**	Explosive Atmospheres - Part 0: Equipment - General Requirements
CAN/CSA C22.2 No. 60079-11:14	2014 / (Ed. 6.0)	Electrical apparatus for explosive gas atmospheres - Part 11: intrinsic safety “i”
CAN/CSA C22.2 No. 60079-26	2016 / (Ed. 3.0)	Explosive atmospheres - Part 26: Equipment with Equipment Protection Level (EPL) Ga
CAN/CSA C22.2 No. 60079-31	2015 / (Ed. 2.0)	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
UL 61010-1	2015 / 3rd Edition	Standard for Safety - Electrical Equipment for Measurement, Control, and Laboratory use; Part 1: General requirements
UL 50E	2015 / 2nd Edition	Enclosures for Electrical Equipment, Environmental Considerations
ANSI/IEC 60529	2004	Degrees of protection provided by enclosures (IP Code)
UL 913	2015 / 8th Edition	Intrinsically Safe and Associated Apparatus For Use In Class I, II, and III, Division 1, Hazardous (Classified) Locations
ANSI/UL 60079-0	2013 / (Ed. 6.0)	Explosive Atmospheres - Part 0: Equipment - General Requirements
ANSI/UL 60079-1	2015 / (Ed. 7.0)	Explosive Atmospheres - Part 1: Equipment Protection by Flameproof Enclosures “d”
ANSI/UL 60079-11	2013 / (Ed. 6.0)	Explosive Atmospheres - Part 11: Equipment Protection by Intrinsic Safety “i”
ANSI/UL 60079-26	2017 / (Ed. 3.0)	Explosive Atmospheres - Part 26: Equipment with Equipment Protection Level (EPL) Ga
ANSI/UL 60079-31	2015 / (Ed. 2.0)	Equipment dust ignition protection by enclosure “t”
FM Class 3600	2018	Electrical Equipment for Use in Hazardous (Classified) Locations - General Requirements
FM Class 3616	2011	Dust-Ignitionproof Electrical Equipment - General Requirements

* ‘R’ = ‘Reaffirmed’

** ‘(Ed. n.n)’ refers to Edition No. of IEC standard for the mention national standard

Supplement to Certificate of Compliance

Certificate: 70191118 **Master Contract:** 153857

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
70191118	2018-12-05	Original CSA HAZLOC certification for North America (Canada and USA) of VEGADIF DF85 series of differential pressure sensors for "E x t"/DIP, and for "Ex ia"/IS methods of protection based on acceptance of IECEx certificates and reports issued by IECEx Certification Agencies.

