Sicherheitshinweise / Safety instructions

ATEX / UKEX / IECEx / c-FM-us / c-CSA-us

VEGAPULS 21, 31

Eigensicherheit "i"

Intrinsic safety "i"

Document ID: 62414

- EU-type approval certificate KIWA 19 ATEX 0028 X (Document ID: 62415)
- UK Type Examination Certificate UL21UKEX2284X (Document ID: 66421)
- Certificate of Conformity IECEx KIWA 19.0015 X (Document ID: 62416)
- Certificate of Conformity FM20CA0003X, FM20US0007X (Document ID: 62417)
- Certificate of Conformity CSA 19CA80000123X (Document ID: 62418)

Redaktionsstand: 2022-02-16

62414-UN-220216

DE Sicherheitshinweise
EN Safety instructions
FR Consignes de sécurité
ES Instrucciones de seguridad

VEGAPULS 21, 31

Eigensicherheit "i"
Zweileiter 4 … 20 mA/HART

CE 0044

Document ID: 62414

VEGA

ATEX

Inhaltsverzeichnis

Ergänzende Dokumentation:

- Betriebsanleitungen VEGAPULS 21, 31
- EU-Baumusterprüfbescheinigung KIWA 19 ATEX 0028 X (Document ID: 62415)
- EU-Konformitätserklärung (Document ID: 61788)

Redaktionsstand: 2019-10-30

62414-01-200123

DE	Sicherheitshinweise für den Einsatz in explosionsgefährdeten Bereichen
EN	Safety instructions for the use in hazardous areas
FR	Consignes de sécurité pour une application en atmosphères explosibles
IT	Normative di sicurezza per l'impiego in luoghi con pericolo di esplosione
ES	Instrucciones de seguridad para el empleo en áreas con riesgo de explosión
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NL	Veiligheidsaanwijzingen voor gebruik op plaatsen waar ontploffingsgevaar kan heersen
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1 Geltung

Diese Sicherheitshinweise gelten für die VEGAPULS 21, 31 der Typenreihen:

- VEGAPULS 21
- VEGAPULS 31

Mit den Elektronikausführungen:

- H - Zweileiter 4 … 20 mA/HART

Gemäß der EU-Baumusterprüfbescheinigung KIWA 19 ATEX 0028 X (Bescheinigungsnummer auf dem Typschild) und für alle Geräte mit dem Sicherheitshinweis 62414.

Die Zündschutzkennzeichnung sowie die zugrundeliegenden Normenstände können aus der EU-Baumusterprüfbescheinigung entnommen werden.

Normenstände:

- EN 60079-0: 2018, Allgemeine Bestimmungen
- EN 60079-11: 2012, Eigensicherheit "i"
- EN 60079-26: 2015, Betriebsmittel mit Geräteschutzniveau (EPL) Ga

Zündschutzkennzeichen:

- II 1G, 1/2G Ex ia IIC T4 … T1 Ga, Ga/Gb

2 Gerätekonfiguration/-eigenschaften

Die detaillierten Gerätekonfigurationen können mit Hilfe der Seriennummersuche auf unserer Homepage abgerufen werden.

Gehen Sie auf "www.vega.com" und geben Sie im Suchfeld die Seriennummer Ihres Gerätes ein.

Alternativ finden Sie alles über Ihr Smartphone:

- VEGA Tools-App aus dem "*Apple App Store*", "*Google Play Store*" oder " *Baidu Store*" herunterladen
- DataMatrix-Code auf dem Typschild des Gerätes scannen oder
- Seriennummer manuell in die App eingeben

3 Allgemeines

Die VEGAPULS 21, 31 in Zündschutzart Eigensicherheit „i“ dienen zur Erfassung des Abstandes zwischen einer Füllgutoberfläche und dem Sensor mittels hochfrequenter, elektromagnetischer Wellen im GHz-Bereich.

Die Elektronik nutzt die Laufzeit der von der Füllgutoberfläche reflektierten Signale, um den Abstand zur Füllgutoberfläche zu errechnen.

Die VEGAPULS 21, 31 bestehen aus einem Elektronikgehäuse, einem Prozessanschlusselement und einem Messfühler bzw. einer Antenne.

Beim VEGAPULS 31 ist noch zusätzlich eine Anzeige- und Bedieneinheit eingebaut.

Die VEGAPULS 21, 31 sind geeignet für den Einsatz in explosionsfähiger Atmosphäre aller brennbaren Stoffe der Explosionsgruppen IIA, IIB und IIC.

Die VEGAPULS 21, 31 sind für Anwendungen geeignet, die Betriebsmittel der Kategorie 1G (EPL Ga), 1/2G (EPL Ga/Gb) oder 2G (EPL Gb) erfordern.

4 Anwendungsbereich

Kategorie 1G (EPL Ga-Betriebsmittel)
Die VEGAPULS 21, 31 mit dem mechanischen Befestigungselement werden im explosionsgefähr-

deten Bereich der Zone 0 errichtet, die ein Betriebsmittel der Kategorie 1G (EPL Ga) erfordern.

Kategorie 1/2G (EPL Ga/Gb-Betriebsmittel)
Die VEGAPULS 21, 31 mit dem mechanischen Befestigungselement werden im explosionsgefährdeten Bereich der Zone 1 errichtet, die ein Betriebsmittel der Kategorie 2G (EPL Gb) erfordern. Das mechanische Befestigungselement, Prozessanschlusselement wird in der Trennwand errichtet, die die Bereiche voneinander trennt, in denen Betriebsmittel der Kategorie 2G (EPL Gb) oder 1G (EPL Ga) erforderlich sind. Das Sensormesssystem wird im explosionsgefährdeten Bereich der Zone 0 errichtet, die ein Betriebsmittel der Kategorie 1G (EPL Ga) erfordert.

5 Besondere Betriebsbedingungen ("X"-Kennzeichnung)

Die nachfolgende Übersicht listet alle besonderen Eigenschaften des VEGAPULS 21, 31, welche eine Kennzeichnung mit dem Symbol "X" hinter der Zertifikatsnummer erforderlich machen.

Elektrostatische Aufladung (ESD)
Die Details hierzu sind dem Kapitel "*Elektrostatische Aufladung (ESD)*" dieser Sicherheitshinweise zu entnehmen.

Umgebungstemperatur
Die Details hierzu sind dem Kapitel "*Thermische Daten*" dieser Sicherheitshinweise zu entnehmen.

6 Zusätzliche Hinweise für den sicheren Betrieb

- Für Prozessdrücke außerhalb der üblichen atmosphärischen Bedingungen von 80 kPa (0,8 bar) bis 110 kPa (1,1 bar) können weitergehende Anforderungen gelten.

Anschlussbedingungen
- Nicht benutzte Öffnungen sind zu verschließen. Die je nach Geräteausführung bei der Auslieferung eingeschraubten roten Gewinde- bzw. Staubschutzkappen müssen vor der Inbetriebnahme entfernt und durch geeignete, für die jeweilige Zündschutzart und IP-Schutzart zugelassene Kabel- und Leitungseinführungen bzw. Verschlussschrauben ersetzt werden
- Beträgt die Temperatur an den Einführungsteilen mehr als 70 °C müssen entsprechende temperaturbeständige Anschlussleitungen verwendet werden
- Es dürfen keine metallischen Kabelverschraubungen verwendet werden
- Dem VEGAPULS 21, 31 kann bei Bedarf ein geeigneter Überspannungsschutz vorgeschaltet werden

7 Wichtige Hinweise für die Montage und Wartung

Allgemeine Hinweise
Für die Montage, die elektrische Installation, die Inbetriebnahme und die Wartung des Gerätes müssen folgende Voraussetzungen erfüllt werden:

- Das Personal muss über die Qualifikation entsprechend seiner Funktion und Tätigkeit verfügen
- Das Personal muss im Explosionsschutz ausgebildet sein
- Das Personal muss mit den entsprechenden gültigen Vorschriften vertraut sein, z. B. Projektierung und Errichtung entsprechend der IEC/EN 60079-14
- Bei Arbeiten am Gerät (Montage, Installation, Wartung) ist sicherzustellen, dass keine explosionsfähige Atmosphäre vorhanden ist, wenn möglich, Versorgungsstromkreise spannungslos schalten
- Gerät entsprechend den Herstellerangaben, der EU-Baumusterprüfbescheinigung und entsprechend den gültigen Vorschriften, Regeln und Normen installieren
- Veränderungen am Gerät können den Explosionsschutz und somit die Sicherheit beeinträchtigen

- Veränderungen dürfen nur durch von der Firma VEGA autorisiertes Personal durchgeführt werden
- Nur zugelassene Ersatzteile verwenden

Montage
Bei der Gerätemontage ist zu beachten:

- Mechanische Beschädigungen am Gerät sind zu vermeiden
- Mechanische Reibungen sind zu vermeiden
- Wird das Gerät als Trennwandgerät verwendet, muss der Betreiber die gültigen anwendbaren Installationsvorschriften beachten
- Vor dem Betrieb den/die Gehäusedeckel bis zum Anschlag fest zudrehen, um die auf dem Typschild angegebene IP-Schutzart sicher zu stellen

Wartung
Zur Sicherstellung der Funktion des Gerätes wird eine periodische Sichtkontrolle empfohlen auf:

- Sichere Montage
- Keine mechanischen Beschädigungen oder Korrosion
- Durchgescheuerte oder anderweitig beschädigte Leitungen
- Keine lockere Verbindungen der Leitungsanschlüsse, Potenzialausgleichsanschlüsse
- Korrekte und eindeutig gekennzeichnete Leitungsverbindungen

8 Elektrostatische Aufladung (ESD)

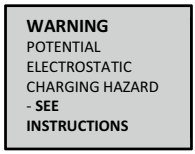
Bezüglich der Gefahr elektrostatischer Aufladungen beachten:

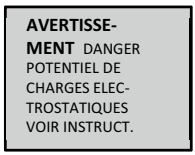
- Reibung an den Oberflächen vermeiden
- Oberflächen nicht trocken reinigen

Die Geräte sind so zu errichten/installieren, dass Folgendes ausgeschlossen werden kann:

- elektrostatische Aufladungen durch Betrieb, Wartung und Reinigung
- prozessbedingte elektrostatische Aufladungen, z. B. durch vorbei strömende Messstoffe

Das Warnschild weist auf die Gefahr hin:





Für Messstoffe mit einer Leitfähigkeit kleiner 10^{-8} S/m gilt:

- Das Füllstandmessgerät darf nicht zum Einsatz kommen, wenn stark ladungserzeugende Prozesse vorhanden sind, wie z. B. maschinelle Reib- und Trennprozesse, das Sprühen von Elektronen, usw.
- Insbesondere darf das Füllstandmessgerät nicht in einen pneumatischen Förderstrom montiert werden

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9 Elektrische Daten

VEGAPULS 21, 31

Versorgungs- und Signalstromkreis:	
Klemmen 1[+], 2[-] im Elektronikraum	In Zündschutzart Eigensicherheit Ex ia IIC
	Zum Anschluss an einen bescheinigten, eigensicheren Stromkreis. $U_i \leq 30$ V DC $I_i \leq 131$ mA $P_i \leq 983$ mW
	Die wirksame innere Kapazität C_i ist vernachlässigbar klein. Die wirksame innere Induktivität L_i ist vernachlässigbar klein.

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Anzeige- und Bedienstromkreis:	
Steckverbinder im Elektronikraum	In Zündschutzart Eigensicherheit Ex ia IIC
	Nur zum Anschluss an das zugehörige Anzeige- und Bedienmodul.

10 Thermische Daten

VEGAPULS 21, 31

Temperaturklasse	**Zulässiger Prozesstemperaturbereich an der Antenne in Zone 0 (EPL Ga)**	**Zulässiger Umgebungstemperaturbereich am Elektronikgehäuse in Zone 0 (EPL Ga)**
T4 … T1	-40 … +80 °C	-40 … +70 °C

Contents

Supplementary documentation:

- Operating Instructions VEGAPULS 21, 31
- EU-type approval certificate KIWA 19 ATEX 0028 X (Document ID: 62415)
- EU declaration of conformity (Document ID: 61788)

Editing status: 2019-10-30

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1 Area of applicability

These safety instructions apply to the VEGAPULS 21, 31 of type series:

- VEGAPULS 21
- VEGAPULS 31

With the electronics versions:

- H - Two-wire 4 … 20 mA/HART

According to EU type approval certificate KIWA 19 ATEX 0028 X (certificate number on the type label) and for all instruments with safety instruction 62414.

The classification as well as the respective standards are stated in the EU type approval certificate.

Standards:

- EN 60079-0: 2018, General Requirements
- EN 60079-11: 2012, Intrinsic safety "i"
- EN 60079-26: 2015, Equipment with equipment protection level (EPL) Ga

Type of protection marking:

- II 1G, 1/2G Ex ia IIC T4 … T1 Ga, Ga/Gb

2 Device configuration/-properties

The detailed device configurations can be retrieved using the serial number search on our homepage.

Move to "www.vega.com" and enter in the search field the serial number of your instrument.

Alternatively, you can find all via your smartphone:

- Download the VEGA Tools app from the "*Apple App Store*", "*Google Play Store*" or "*Baidu Store*"
- Scan the DataMatrix code on the type label of the instrument or
- Enter the serial number manually in the app

3 General information

The VEGAPULS 21, 31 in ignition protection type intrinsic safety "i" are used for detection of the distance between product surface and sensor by means of high frequency, electromagnetic waves in the GHz range.

The electronics uses the running time of the signals reflected by the product surface to calculate the distance to the product surface.

The VEGAPULS 21, 31 consist of an electronics housing, a process connection element and a sensor or an antenna.

VEGAPULS 31 is equipped with an additional display and adjustment unit.

The VEGAPULS 21, 31 are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGAPULS 21, 31 are suitable for applications requiring category 1G (EPL Ga), 1/2G (EPL Ga/Gb) or 2G (EPL Gb) instruments.

4 Application area

Category 1G (EPL Ga instruments)

The VEGAPULS 21, 31 with the mechanical fixing element are installed in hazardous areas of zone 0 requiring category 1G (EPL Ga) instruments.

Category 1/2G (EPL Ga/Gb instruments)
The VEGAPULS 21, 31 with mechanical fixing element are installed in hazardous areas of zone 1 requiring instruments of category 2G (EPL Gb). The mechanical fixing element, process connection element is installed in the separating wall, which separates areas requiring instruments of category 2G (EPL Gb) or 1G (EPL Ga). The sensor measuring system is installed in hazardous areas of zone 0 requiring instruments of category 1G (EPL Ga).

5 Specific conditions of use ("X" identification)

The following overview is listing all special properties of VEGAPULS 21, 31, which make a labelling with the symbol "X" behind the certificate number necessary.

Electrostatic charging (ESD)
You can find the details in chapter "*Electrostatic charging (ESD)*" of these safety instructions.

Ambient temperature
You can find the details in chapter "*Thermal data*" of these safety instructions.

6 Additional instructions for safe operation

- For process pressures outside the standard atmospheric conditions of 80 kPa (0.8 bar) to 110 kPa (1.1 bar) additional requirements can be valid.

Connection conditions
- Unused openings must be covered. The red thread or/dust covers screwed in when the instruments are shipped (depending on the version) must be removed before setup and replaced by cable entries or closing screws suitable for the respective ignition protection type and IP protection.
- If the temperature at the inlet components exceeds 70 °C, temperature-resistant connection cables must be used
- Metal cable glands must not be used
- If necessary, a suitable overvoltage arrester can be connected in front of the VEGAPULS 21, 31

7 Important information for mounting and maintenance

General instructions
The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:

- The staff must be qualified according the respective tasks
- The staff must be trained in explosion protection
- The staff must be familiar with the respectively valid regulations, e.g. planning and installation acc. to IEC/EN 60079-14
- Make sure when working on the instrument (mounting, installation, maintenance) that there is no explosive atmosphere present, the supply circuits should be voltage-free, if possible.
- The instrument has to be mounted according to the manufacturer specifications, the EU type approval certificate and the valid regulations and standards
- Modifications on the instrument can influence the explosion protection and hence the safety
- Modifications must only be carried out by employees authorized by VEGA company
- Use only approved spare parts

Mounting
Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided

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- Mechanical friction must be avoided
- If the device is used as a separating wall device, the operator must observe the applicable installation regulations.
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label

Maintenance

To ensure the functionality of the device, periodic visual inspection is recommended for:

- Secure mounting
- No mechanical damages or corrosion
- Worn or otherwise damaged cables
- The potential equalization terminal must be secured against loosening
- Correct and clearly marked cable connections

8 Electrostatic charging (ESD)

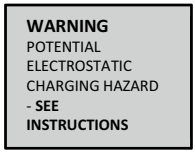
Take note in case of danger of electrostatic charges:

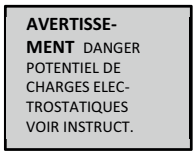
- Avoid friction on the surfaces
- Do not dry clean the surfaces

The instruments must be mounted/installed in such a way that the following can be ruled out:

- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing past

The warning label indicates danger:





For media with a conductivity smaller than 10^{-8} S/m applies:

- The level measuring instrument must not be used in highly charge generating processes, e.g. mechanical friction and separation processes, spraying of electrons, etc.
- In particular, the level measuring instrument must not be mounted in a pneumatic conveying flow

9 Electrical data

VEGAPULS 21, 31

Supply and signal circuit:	
Terminals 1[+], 2[-] in electronics compartment	In type of protection intrinsic safety Ex ia IIC
	For connection to a certified, intrinsically safe circuit. $U_i \leq 30$ V DC $I_i \leq 131$ mA $P_i \leq 983$ mW
	The effective internal capacitance C_i is negligibly small. The effective internal inductance L_i is negligibly small.

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Display and adjustment circuit:	
Plug connector in the electronics compartment	In type of protection intrinsic safety Ex ia IIC
	Only for connection to the corresponding display and adjustment module.

10 Thermal data

VEGAPULS 21, 31

Temperature class	**Permissible process temperature range on the antenna in zone 0 (EPL Ga)**	**Permissible ambient temperature range on the electronics housing in zone 0 (EPL Ga)**
T4 … T1	-40 … +80 °C	-40 … +70 °C

Table des matières

Documentation complémentaire:

- Notices de mise en service VEGAPULS 21, 31
- Certificat de contrôle UE de type KIWA 19 ATEX 0028 X (Document ID: 62415)
- Déclaration de conformité UE (ID du document : 61788)

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1 Validité

Ces consignes de sécurité sont valables pour les VEGAPULS 21, 31 des séries :

- VEGAPULS 21
- VEGAPULS 31

Avec les versions électroniques :

- H - Deux fils 4 … 20 mA/HART

Conformément au certificat de contrôle de type UE KIWA 19 ATEX 0028 X (numéro du certificat sur la plaque signalétique) et pour tous les appareils portant le numéro de la consigne de sécurité 62414.

L'identification de protection contre l'inflammation ainsi que les états normalisés sur lesquels elle se fonde figurent dans le certification de contrôle de type UE.

États normalisés :

- EN 60079-0: 2018, dispositions générales
- EN 60079-11: 2012, sécurité intrinsèque "i"
- EN 60079-26: 2015, Moyens d'exploitation avec niveau de protection du matériel (EPL) Ga

Mode de protection :

- II 1G, 1/2G Ex ia IIC T4 … T1 Ga, Ga/Gb

2 Configuration / propriétés des appareils

Vous pouvez consulter la configuration détaillée de l'appareil au moyen de la recherche de numéros de série sur notre page d'accueil.

Rendez-vous sur "www.vega.com" et indiquez dans la zone de recherche le numéro de série de votre appareil.

Vous trouverez en alternative tout sur votre smartphone :

- Télécharger l'application VEGA Tools depuis l'"*Apple App Store*", le "*Google Play Store*" ou le "*Baidu Store*"
- Numériser le code DataMatrix situé sur la plaque signalétique de l'appareil ou
- Entrer le numéro de série manuellement dans l'application

3 Généralités

Les VEGAPULS 21, 31 en mode de protection sécurité intrinsèque „i“ servent à la détection de la distance entre une surface de produit et le capteur au moyen d'ondes électromagnétiques à haute fréquence dans la plage de GHz.

L'électronique utilise le temps de propagation des signaux réfléchis par la surface du produit pour calculer la distance par rapport à la surface du produit.

Les VEGAPULS 21, 31 sont composés d'un boîtier de l'électronique, d'un élément de raccord process et d'un élément de mesure ou d'une antenne.

Une unité de réglage et d'affichage est montée encore en plus sur le VEGAPULS 31.

Les VEGAPULS 21, 31 sont appropriés pour l'utilisation dans des atmosphères explosives de toutes les matières inflammables des groupes d'explosion IIA, IIB et IIC.

Les VEGAPULS 21, 31 sont appropriés pour les applications nécessitant un matériel de la catégorie 1G (EPL Ga), 1/2G (EPL Ga/Gb) ou 2G (EPL Gb).

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4 Domaine d'application

Catégorie 1G (matériels EPL Ga)
Les VEGAPULS 21, 31 avec élément de fixation mécanique sont installés dans l'atmosphère explosible de la zone 0 nécessitant un matériel de la catégorie 1G (matériel EPL Ga).

Catégorie 1/2G (matériels EPL Ga/Gb)
Les VEGAPULS 21, 31 avec l'élément de fixation mécanique sont installés dans une zone explosible de niveau 1 qui requiert un matériel de la catégorie 2G (EPL Gb). L'élément de fixation mécanique, l'élément de raccord process, est installé dans la paroi de séparation qui sépare les unes des autres les zones qui nécessitent un matériel de la catégorie 2G (EPL Gb) ou 1G (EPL Ga). Le système de mesure du capteur est installé dans la zone explosible de niveau 0 qui requiert un matériel de la catégorie 1G (EPL Ga).

5 Conditions d'utilisation particulières (caractérisation "X")

L'aperçu ci-après liste toutes les caractéristiques spécifiques au VEGAPULS 21, 31 nécessitant une caractérisation par le symbole "X" après le numéro de certificat.

Charge électrostatique (ESD)
Les détails à cet effet sont indiqués au chapitre "*Charge électrostatique*" des présentes consignes de sécurité.

Température ambiante
Les détails sont indiqués au chapitre "*Caractéristiques thermiques*" des présentes consignes de sécurité.

6 Remarques supplémentaires pour une exploitation sure

- Pour les pressions de processus en dehors des conditions atmosphériques courantes entre 80 kPa (0,8 bar) et 110 kPa (1,1 bar), des exigences complémentaires peuvent s'appliquer.

Conditions de raccordement
- Fermer les orifices non utilisés. Les obturateurs de protection contre la poussière ou de filetage rouges vissés à la livraison en fonction de la version d'appareil doivent être retirés avant la mise en service et remplacés par des introductions de câble et de conduites ou des vis de fermeture en fonction du type de protection contre l'inflammation et de la protection IP
- Si la température aux pièces d'introduction dépasse 70 °C, il faudra utiliser des lignes de raccordement adéquates et résistantes aux températures régnant sur le site
- Il est interdit d'utiliser des presse-étoupes métalliques
- Si besoin est, une protection approprié contre les surtensions peut être installée en amont du VEGAPULS 21, 31

7 Instructions importantes pour le montage et l'entretien

Remarques générales
Pour le montage, l'installation électrique, la mise en service et l'entretien de l'appareil, les conditions suivantes doivent être réunies :

- Le personnel doit disposer des qualifications correspondant à ses fonctions et activités
- Le personnel doit être formé à la protection contre les explosions
- Le personnel doit être familier des dispositions en vigueur, par ex. sur la conception, sélection et construction d'installations électriques selon la norme CEI/EN 60079-14

- Lors des opérations sur l'appareil (montage, installation, entretien), il est impératif de s'assurer de l'absence totale d'atmosphère explosible, et si possible mettre les circuits électriques d'alimentation hors tension.
- Installer l'appareil conformément aux indications du fabricant, au certificat de contrôle de type UE et aux réglementations en vigueur.
- Les modifications de l'appareil peuvent affecter la protection anti-déflagrante et ainsi la sécurité
- Le personnel de la Société VEGA est le seul habilité à procéder à des modifications
- Utiliser uniquement des pièces de rechange homologuées

Montage

Lors du montage de l'appareil, respecter les consignes suivantes :

- Éviter les dommages mécaniques à l'appareil
- Éviter les frottements mécaniques
- Si l'appareil est utilisé en montage sur paroi séparatrice, l'exploitant a l'obligation de respecter les consignes d'installation applicables en vigueur.
- Avant l'exploitation, fixer le(s) couvercle(s) du boîtier en le tournant jusqu'à la butée pour assurer la protection IP indiquée sur la plaque signalétique

Maintenance

Pour garantir le fonctionnement de l'appareil, un contrôle visuel périodique est recommandé concernant :

- Fiabilité du montage
- Aucune détérioration mécanique ou corrosion
- Câbles usés ou autrement détériorés
- Aucune connexion lâche des raccordements de conduite, raccordements de compensation de potentiel
- Connexions de câbles correctes et clairement marquées

8 Charge électrostatique (ESD)

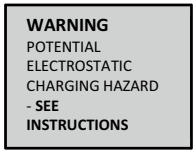
À respecter en matière de risques électrostatiques :

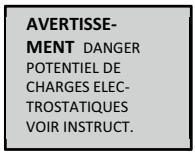
- éviter les frottements sur les surfaces
- ne pas nettoyer les surfaces à sec

Installer les appareils de manière à pouvoir exclure les problèmes suivants :

- charges électrostatiques lors du fonctionnement, de la maintenance et du nettoyage
- charges électrostatiques causées par le process, par ex. par le flux des produits à mesurer

La plaque signalétique avertit contre le danger :





Ce qui suit s'applique aux produits mesurés avec une conductivité inférieure à 10^{-8} S/m :

- Le détecteur de niveau ne doit pas être utilisé en présence de process générant de fortes charges comme par ex. les process de friction ou de tronçonnage à la machine, la pulvérisation d'électrodes, etc.
- Il est en particulier interdit de monter le détecteur de niveau dans un flux pneumatique.

9 Caractéristiques électriques

VEGAPULS 21, 31

Circuit d'alimentation et signal :	
Bornes 1[+], 2[-] dans le compartiment de l'électronique	En mode de protection sécurité intrinsèque Ex ia IIC
	Pour le raccordement à un circuit courant de sécurité intrinsèque certifié. $U_i \leq 30$ V DC $I_i \leq 131$ mA $P_i \leq 983$ mW
	La valeur de la capacité interne effective C_i est tout à fait négligeable. La valeur de l'inductance interne effective L_i est tout à fait négligeable.

VEGAPULS 31

Circuit courant d'affichage et de réglage :	
Connecteur dans le compartiment de l'électronique	En mode de protection sécurité intrinsèque Ex ia IIC
	Uniquement pour le raccordement au module de réglage et d'affichage correspondant.

10 Caractéristiques thermiques

VEGAPULS 21, 31

Classe de température	**Plage de température process admissible sur l'antenne en zone 0 (EPL Ga)**	**Plage de température ambiante admissible sur le boîtier de l'électronique en zone 0 (EPL Ga)**
T4 … T1	-40 … +80 °C	-40 … +70 °C

Índice

Documentación adicional:

- Manuales de instrucciones VEGAPULS 21, 31
- Certificado de control de tipos UE KIWA 19 ATEX 0028 X (Document ID: 62415)
- Declaración de conformidad EU (Document ID: 61788)

Estado de redacción: 2019-10-30

62414-01-200123

DE	Sicherheitshinweise für den Einsatz in explosionsgefährdeten Bereichen
EN	Safety instructions for the use in hazardous areas
FR	Consignes de sécurité pour une application en atmosphères explosibles
IT	Normative di sicurezza per l'impiego in luoghi con pericolo di esplosione
ES	Instrucciones de seguridad para el empleo en áreas con riesgo de explosión
PT	Normas de segurança para utilização em zonas sujeitas a explosão
NL	Veiligheidsaanwijzingen voor gebruik op plaatsen waar ontploffingsgevaar kan heersen
SV	Säkerhetsanvisningar för användning i explosiionsfarliga områden
DA	Sikkerhedsforskrifter til anvendelse i explosionsfarlig atmosfare
FI	Turvallisuusohjeet räjähdysvaarallisisssa tiloissa käyttöä varten
EL	Υποδείξεις ασΦαλείας για τη χρησιμοποίηση σε περιοχές που υπάρχει κίνδυνος έκρηξης

DE	Die vorliegenden Sicherheitshinweise sind im Download unter www.vega.com standardmäßig in den Sprachen deutsch, englisch, französisch und spanisch verfügbar. Weitere EU-Landessprachen stellt VEGA nach Anforderungen zur Verfügung.
EN	These safety instructions are available as a standard feature in the download area under www.vega.com in the languages German, English, French and Spanish. Further EU languages will be made available by VEGA upon request.
FR	Les présentes consignes de sécurité sont disponibles au téléchargement sous www.vega.com en standard en allemand, en anglais, en francais et en espagnol. VEGA met à disposition d'autres langues de l'Union Européenne selon les exigences.
ES	Las indicaciones de seguridad presentes están disponibles en la zona de descarga de www.vega.com de forma estándar en los idiomas inglés, francés y español. VEGA pone a disposición otros idiomas de la UE cuando son requeridos.

1 Vigencia

Las presentes instrucciones de seguridad son validas para los VEGAPULS 21, 31 de la serie:

- VEGAPULS 21
- VEGAPULS 31

Con las versiones electrónicas:

- H - De dos hilos 4 … 20 mA/HART

según el certificado de examen de tipo UE KIWA 19 ATEX 0028 X (Número de certificación en la placa de tipos) y para todos los instrumentos con la instrucción de seguridad 62414.

La etiqueta de protección contra ignición, así como los estados de las normas correspondientes se pueden tomar del certificado de examen de tipo UE.

Estados normalizados

- EN 60079-0: 2018, 1. Disposiciones generales
- EN 60079-11: 2012, Seguridad intrínseca "i"
- EN 60079-26: 2015, Equipamiento con nivel de protección de equipos (EPL) Ga

Símbolo de protección e:

- II 1G, 1/2G Ex ia IIC T4 … T1 Ga, Ga/Gb

2 Configuración/propiedades del equipo

Las configuraciones detalladas de los equipos se pueden consultar con ayuda de la búsqueda de números de serie en nuestra página web.

Vaya a "www.vega.com" e introduzca el número de serie de su dispositivo en el campo de búsqueda.

Opcionalmente, también podrá encontrar todo lo relacionado con su smartphone:

- Descargar las aplicaciones VEGA Tools desde "*Apple App Store*", "*Google Play Store*" o "*Baidu Store*"
- Escanear DataMatrix-Code de la placa de tipos del instrumento o
- Entrar el número de serie manualmente en el App

3 Informaciones generales

El VEGAPULS 21, 31 en el tipo de protección de seguridad intrínseca "i" sirve para la detección de la distancia entre la superficie de un producto y el sensor por medio de ondas electromagnéticas de alta frecuencia en el rango de GHz.

La electrónica utiliza el tiempo de recorrido de las señales reflejadas por la superficie del producto almacenado para calcular la distancia hasta dicha superficie.

Los VEGAPULS 21, 31 se componen de una carcasa para la electrónica, un elemento de conexión a proceso y una sonda de medición o una antena.

El VEGAPULS 31 está equipado con una unidad de configuración y visualización adicional.

Los VEGAPULS 21, 31 son apropiados para el empleo en una atmósfera explosiva de todas las sustancias inflamables de los grupos de explosión IIA, IIB y IIC.

Los VEGAPULS 21, 31 son apropiados para aplicaciones que requieren medios de producción de la categoría 1G (EPL Ga), 1/2G (EPL Ga/Gb) ó 2G (EPL Gb).

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4 Campo de aplicación

Categoría 2D (Instrumentos EPL Ga)
Los VEGAPULS 21, 31 con el elemento de fijación mecánica se instalan en el área con riesgo de explosión de la zona 0 que requieren un medio de producción de la categoría 1G (EPL Ga).

Categoría 1/2D (Instrumentos 1/2G (EPL Ga/Gb)
El VEGAPULS 21, 31 con el elemento de fijación mecánico se instala en la zona potencialmente explosiva de la zona 1, que requiere equipos de la categoría 2G (EPL Gb). El elemento de fijación mecánico, elemento de conexión a proceso se instala en la pared de separación, que divide las áreas en las que se requieren equipos categoría 2G (EPL Gb) o 1G (EPL Ga). El sistema de medición del sensor se instala en la zona explosiva de la zona 0, que requiere un equipo de categoría 1G (EPL Ga).

5 Condiciones de operación especiales (Identificación "X")

La siguiente tabla muestra todas las propiedades especiales del VEGAPULS 21, 31 que requieren una marca con el símbolo "X" después del número de certificado.

Carga electrostática (ESD)
Para detalles al respecto, consultar el capítulo "*Carga electrostática (ESD)*" de estas instrucciones de seguridad.

Temperatura ambiente
Los detalles se pueden encontrar en el capítulo "*Datos térmicos*" de estas instrucciones de seguridad.

6 Información adicional para un funcionamiento seguro

- Para presiones de proceso fuera de las condiciones atmosféricas de 80 kPa (0,8 bar) hasta 110 kPa (1,1 bar pueden aplicarse otros requisitos.

Condiciones de conexión
- Hay que cerrar las aberturas no utilizadas. Antes de la puesta en marcha hay que quitar las tapas protectoras de roscas o de protección contra polvo enroscadas durante el suministro del instrumento y sustituirlas por entradas de cables y de líneas o tapones adecuados para el tipo de protección y el tipo de protección IP correspondiente.
- Si la temperatura en las piezas de entrada es mayor de 70 °C, hay que emplear líneas de conexión adecuadas resistentes a la temperatura
- No se deben utilizar prensaestopas metálicos.
- En caso necesario se puede conectar una protección contra sobretensiones adecuada previa al VEGAPULS 21, 31

7 Indicaciones importantes para el montaje y mantenimiento

Instrucciones generales
Para el montaje, la instalación eléctrica, la puesta en marcha y el mantenimiento del instrumento hay cumplir los requisitos siguientes:

- El personal debe tener las calificaciones de acuerdo a su función y actividad
- El personal tiene que estar entrenado en la protección contra explosión
- El personal debe estar familiarizado con la normativa vigente, por ejemplo, planificación y construcción de acuerdo con la norma IEC/EN 60079-14

- Cuando trabaje en el dispositivo (instalación, instalación, mantenimiento), asegúrese de que no haya atmósfera potencialmente explosiva; si es posible, desconecte los circuitos de la fuente de alimentación.
- Instale el dispositivo de acuerdo con las instrucciones del fabricante, el certificado de examen de tipo UE y las reglamentaciones, reglas y normas aplicables.
- Cambios en el instrumento pueden afectar la protección contra explosión y por lo tanto la seguridad
- Modificaciones solamente pueden ser realizada por personal autorizado por la empresa VEGA.
- Usar solo piezas de repuesto aprobadas

Montaje
Durante el montaje del instrumento, por favor tenga en cuenta:

- Hay que evitar daños mecánicos en el instrumento
- Hay que evitar fricción mecánica
- Si el dispositivo se utiliza como un dispositivo de pared divisoria, el operador debe observar las normas de instalación aplicables.
- Antes de la operación atornillar la/las tapa(s) de la carcasa hasta el tope, para asegurar el tipo de protección IP indicado en la placa de tipos

Mantenimiento
Para asegurar el funcionamiento del instrumento se recomienda realizar un control visual periódico de los siguientes puntos:

- Montaje seguro
- Ningún deterioro mecánico o corrosión
- Líneas desgastadas o dañadas de otra manera
- Ninguna conexión floja de las conexiones de los cables, conexiones de compensación de potencial
- Conexiones de líneas marcadas de forma clara y correcta

8 Carga electrostática (ESD)

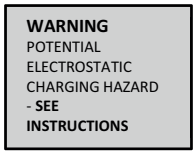
En cuanto al peligro de cargas electrostáticas tener en cuenta:

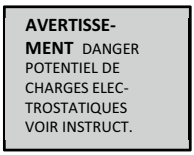
- Evitar fricción en las superficies
- No limpiar las superficies en seco

Hay que instalar los instrumentos de forma que se pueda excluir lo siguiente:

- cargas electrostáticas a causa de la operación, mantenimiento y limpieza
- carga electrostática inducida por el proceso, por ejemplo, a causa del flujo de productos a medir

El cartel de advertencia indica el riesgo:





Para materiales con una conductividad menor que10^{-8} S/m se aplica:

- El detector de nivel no se puede utilizar si existen fuertes procesos generadores de carga, tales como procesos mecánicos de fricción y separación, pulverización de electrones, etc.
- En particular, el detector de nivel no se puede montar en un flujo neumático.

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9 Datos eléctricos

VEGAPULS 21, 31

Circuito de alimentación y señal.	
Bornes 1[+], 2[-] en el compartimento de la electrónica	En tipo de protección seguridad intrínseca Ex ia IIC
	Para la conexión a un circuito con seguridad intrínseca certificado. $U_i \leq 30$ V DC $I_i \leq 131$ mA $P_i \leq 983$ mW
	La capacidad interna efectiva C_i es despreciablemente pequeña. La inductividad interna efectiva L_i es despreciablemente pequeña.

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Circuito de visualización y configuración:	
Conector enchufable en el compartimento de la electrónica	En tipo de protección seguridad intrínseca Ex ia IIC
	Solamente para la conexión al módulo de visualización y configuración correspondiente.

10 Datos térmicos

VEGAPULS 21, 31

Clase de temperatura	**Rango de temperatura de proceso permisible en la antena en la zona 0 (EPL Ga)**	**Rango de temperatura ambiente permisible en la carcasa de la electrónica en la zona 0 (EPL Ga)**
T4 … T1	-40 … +80 °C	-40 … +70 °C

Druckdatum:

Die Angaben über Lieferumfang, Anwendung, Einsatz und Betriebsbedingungen der Sensoren und Auswertsysteme entsprechen den zum Zeitpunkt der Drucklegung vorhandenen Kenntnissen.
Änderungen vorbehalten

62414-01-200123

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ATEX

Safety instructions
VEGAPULS 21, 31

Intrinsic safety "i"

Two-wire 4 … 20 mA/HART

UK CA 0891

Document ID: 62414

VEGA

UKEX

Contents

Supplementary documentation:

- Operating Instructions VEGAPULS 21, 31
- UK-Type Examination Certificate UL21UKEX2284X (Document ID: 66421)
- UK Declaration of Conformity (Document ID: 66473)

Editing status: 2021-10-06

62414-EN-220216

1 Area of applicability

These safety instructions apply to the VEGAPULS 21, 31 of type series:

- VEGAPULS 21
- VEGAPULS 31

With the electronics versions:

- H - Two-wire 4 … 20 mA/HART

According to UK Type Examination Certificate UL21UKEX2284X (certificate number on the type label) and for all instruments with safety instruction 62414.

The classification as well as the respective standards are stated in the UK-Type Examination Certificate.

Standards:

- EN 60079-0: 2018, General Requirements
- EN 60079-11: 2012, Intrinsic safety "i"
- EN 60079-26: 2015, Equipment with equipment protection level (EPL) Ga

Type of protection marking:

- II 1G, 1/2G Ex ia IIC T4 … T1 Ga, Ga/Gb

2 Device configuration/-properties

The detailed device configurations can be retrieved using the serial number search on our homepage.

Move to " www.vega.com" and enter in the search field the serial number of your instrument.

Alternatively, you can find all via your smartphone:

- Download the VEGA Tools app from the " *Apple App Store*", " *Google Play Store*" or " *Baidu Store*"
- Scan the DataMatrix code on the type label of the instrument or
- Enter the serial number manually in the app

3 General information

The VEGAPULS 21, 31 in ignition protection type intrinsic safety "i" are used for detection of the distance between medium surface and sensor by means of high frequency, electromagnetic waves in the GHz range.

The electronics uses the running time of the signals reflected by the medium surface to calculate the distance to the medium surface.

The VEGAPULS 21, 31 consist of an electronics housing, a process connection element and a sensor or an antenna.

VEGAPULS 31 is equipped with an additional display and adjustment unit.

The VEGAPULS 21, 31 are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGAPULS 21, 31 are suitable for applications requiring category 1G (EPL Ga), 1/2G (EPL Ga/Gb) or 2G (EPL Gb) instruments.

4 Application area

Category 1G (EPL Ga instruments)

The VEGAPULS 21, 31 with the mechanical fixing element are installed in hazardous areas of zone

0 requiring category 1G (EPL Ga) instruments.

Category 1/2G (EPL Ga/Gb instruments)
The VEGAPULS 21, 31 with mechanical fixing element are installed in hazardous areas of zone 1 requiring instruments of category 2G (EPL Gb). The mechanical fixing element, process connection element is installed in the separating wall, which separates areas requiring instruments of category 2G (EPL Gb) or 1G (EPL Ga). The sensor measuring system is installed in hazardous areas of zone 0 requiring instruments of category 1G (EPL Ga).

5 Specific conditions of use ("X" identification)

The following overview is listing all special properties of VEGAPULS 21, 31, which make a labelling with the symbol "X" behind the certificate number necessary.

Electrostatic charging (ESD)
You can find the details in chapter " *Electrostatic charging (ESD)*" of these safety instructions.

Ambient temperature
You can find the details in chapter " *Thermal data*" of these safety instructions.

6 Additional instructions for safe operation

- For process pressures outside the standard atmospheric conditions of 80 kPa (0.8 bar) to 110 kPa (1.1 bar) additional requirements can be valid.

Connection conditions
- Unused openings must be covered. The red thread or/dust covers screwed in when the instruments are shipped (depending on the version) must be removed before setup and replaced by cable entries or closing screws suitable for the respective ignition protection type and IP protection.
- If the temperature at the entry parts exceeds 70 °C, temperature-resistant connection cables must be used
- Metal cable glands must not be used
- If necessary, a suitable overvoltage arrester can be connected in front of the VEGAPULS 21, 31

7 Important information for mounting and maintenance

General instructions
The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:

- The staff must be qualified according the respective tasks
- The staff must be trained in explosion protection
- The staff must be familiar with the respectively valid regulations, e.g. planning and installation acc. to IEC/EN 60079-14
- Make sure when working on the instrument (mounting, installation, maintenance) that there is no explosive atmosphere present, the supply circuits should be voltage-free, if possible.
- The instrument has to be mounted according to the manufacturer specifications, the UK-Type Examination Certificate and the valid regulations and standards
- Modifications on the instrument can influence the explosion protection and hence the safety, therefore repairs are not permitted to be conducted by the end user
- Modifications must only be carried out by employees authorized by VEGA company
- Use only approved spare parts

Mounting
Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided
- If the device is used as a separating wall device, the operator must observe the applicable installation regulations.
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label

Maintenance
To ensure the functionality of the device, periodic visual inspection is recommended for:

- Secure mounting
- No mechanical damages or corrosion
- Worn or otherwise damaged cables
- No loose connections of the line connections, equipotential bonding connections
- Correct and clearly marked cable connections

8 Electrostatic charging (ESD)

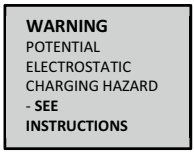
Take note in case of danger of electrostatic charges:

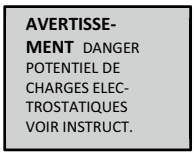
- Avoid friction on the surfaces
- Do not dry clean the surfaces

The instruments must be mounted/installed in such a way that the following can be ruled out:

- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing past

The warning label indicates danger:





For media with a conductivity smaller than 10^{-8} S/m applies:

- The level measuring instrument must not be used in highly charge generating processes, e.g. mechanical friction and separation processes, spraying of electrons, etc.
- In particular, the level measuring instrument must not be mounted in a pneumatic conveying flow

9 Electrical data

VEGAPULS 21, 31

Supply and signal circuit:	
Terminals 1[+], 2[-] in electronics compartment	In type of protection intrinsic safety Ex ia IIC
	For connection to a certified, intrinsically safe circuit. $U_i \leq 30$ V DC $I_i \leq 131$ mA $P_i \leq 983$ mW
	The effective internal capacitance C_i is negligibly small. The effective internal inductance L_i is negligibly small.

VEGAPULS 31

Display and adjustment circuit:	
Plug connector in the electronics compartment	In type of protection intrinsic safety Ex ia IIC
	Only for connection to the corresponding display and adjustment module.

10 Thermal data

VEGAPULS 21, 31

Temperature class	**Permissible process temperature range on the antenna in zone 0 (EPL Ga)**	**Permissible ambient temperature range on the electronics housing in zone 0 (EPL Ga)**
T4 … T1	-40 … +80 °C	-40 … +70 °C

Printing date:

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

62414-EN-220216

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UKEX

Safety instructions
VEGAPULS 21, 31

Intrinsic safety "i"

Two-wire 4 … 20 mA/HART

Document ID: 62414

IECEx

Contents

Supplementary documentation:

- Operating Instructions VEGAPULS 21, 31
- Certificate of Conformity IECEx KIWA 19.0015 X (Document ID: 62416)

Editing status: 2019-10-31

62414-EN-200123

1 Area of applicability

These safety instructions apply to the VEGAPULS 21, 31 of type series:

- VEGAPULS 21
- VEGAPULS 31

With the electronics versions:

- H - Two-wire 4 … 20 mA/HART

According to Certificate of Conformity IECEx KIWA 19.0015 X (certificate number on the type label) and for all instruments with safety instruction 62414.

The classification as well as the respective standards are stated in the Certificate of Conformity.

Standards:

- IEC 60079-0: 2017, General Requirements
- IEC 60079-11: 2011, Intrinsic safety "i"
- IEC 60079-26: 2014, Equipment with equipment protection level (EPL) Ga

Type of protection marking:

- Ex ia IIC T4 … T1 Ga, Ga/Gb

2 Device configuration/-properties

The detailed device configurations can be retrieved using the serial number search on our homepage.

Move to "www.vega.com" and enter in the search field the serial number of your instrument.

Alternatively, you can find all via your smartphone:

- Download the VEGA Tools app from the "*Apple App Store*", "*Google Play Store*" or "*Baidu Store*"
- Scan the DataMatrix code on the type label of the instrument or
- Enter the serial number manually in the app

3 General information

The VEGAPULS 21, 31 in ignition protection type intrinsic safety "i" are used for detection of the distance between product surface and sensor by means of high frequency, electromagnetic waves in the GHz range.

The electronics uses the running time of the signals reflected by the product surface to calculate the distance to the product surface.

The VEGAPULS 21, 31 consist of an electronics housing, a process connection element and a sensor or an antenna.

VEGAPULS 31 is equipped with an additional display and adjustment unit.

The VEGAPULS 21, 31 are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGAPULS 21, 31 are suitable for applications requiring EPL Ga, EPL Ga/Gb or EPL Gb instruments.

4 Application area

EPL Ga instrument

The VEGAPULS 21, 31 with the mechanical fixing element are installed in hazardous areas of zone 0 requiring EPL Ga instruments.

EPL Ga/Gb instrument
The VEGAPULS 21, 31 with mechanical fixing element are installed in hazardous areas of zone 1 requiring EPL Gb instruments. The mechanical fixing element, process connection element is installed in the separating wall, which separates areas requiring EPL Gb or EPL Ga instruments. The sensor measuring system is installed in hazardous areas of zone 0 requiring EPL Ga instruments.

5 Specific conditions of use ("X" identification)

The following overview is listing all special properties of VEGAPULS 21, 31, which make a labelling with the symbol "X" behind the certificate number necessary.

Electrostatic charging (ESD)
You can find the details in chapter "*Electrostatic charging (ESD)*" of these safety instructions.

Ambient temperature
You can find the details in chapter "*Thermal data*" of these safety instructions.

6 Additional instructions for safe operation

- For process pressures outside the standard atmospheric conditions of 80 kPa (0.8 bar) to 110 kPa (1.1 bar) additional requirements can be valid.

Connection conditions
- Unused openings must be covered. The red thread or/dust covers screwed in when the instruments are shipped (depending on the version) must be removed before setup and replaced by cable entries or closing screws suitable for the respective ignition protection type and IP protection.
- If the temperature at the inlet components exceeds 70 °C, temperature-resistant connection cables must be used
- Metal cable glands must not be used
- If necessary, a suitable overvoltage arrester can be connected in front of the VEGAPULS 21, 31

7 Important information for mounting and maintenance

General instructions
The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:
- The staff must be qualified according the respective tasks
- The staff must be trained in explosion protection
- The staff must be familiar with the respectively valid regulations, e.g. planning and installation acc. to IEC 60079-14
- Make sure when working on the instrument (mounting, installation, maintenance) that there is no explosive atmosphere present, the supply circuits should be voltage-free, if possible.
- The instrument has to be mounted according to the manufacturer specifications, the Certificate of Conformity and the valid regulations and standards
- Modifications on the instrument can influence the explosion protection and hence the safety
- Modifications must only be carried out by employees authorized by VEGA company
- Use only approved spare parts

Mounting
Keep in mind for instrument mounting
- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided

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- If the device is used as a separating wall device, the operator must observe the applicable installation regulations.
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label

Maintenance

To ensure the functionality of the device, periodic visual inspection is recommended for:

- Secure mounting
- No mechanical damages or corrosion
- Worn or otherwise damaged cables
- The potential equalization terminal must be secured against loosening
- Correct and clearly marked cable connections

8 Electrostatic charging (ESD)

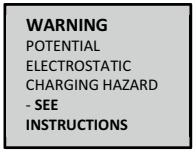
Take note in case of danger of electrostatic charges:

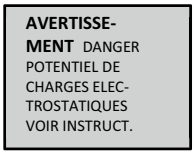
- Avoid friction on the surfaces
- Do not dry clean the surfaces

The instruments must be mounted/installed in such a way that the following can be ruled out:

- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing past

The warning label indicates danger:





For media with a conductivity smaller than 10^{-8} S/m applies:

- The level measuring instrument must not be used in highly charge generating processes, e.g. mechanical friction and separation processes, spraying of electrons, etc.
- In particular, the level measuring instrument must not be mounted in a pneumatic conveying flow

9 Electrical data

VEGAPULS 21, 31

Supply and signal circuit:	
Terminals 1[+], 2[-] in electronics compartment	In type of protection intrinsic safety Ex ia IIC
	For connection to a certified, intrinsically safe circuit. $U_i \leq 30$ V DC $I_i \leq 131$ mA $P_i \leq 983$ mW
	The effective internal capacitance C_i is negligibly small. The effective internal inductance L_i is negligibly small.

VEGAPULS 31

Display and adjustment circuit:	
Plug connector in the electronics compartment	In type of protection intrinsic safety Ex ia IIC
	Only for connection to the corresponding display and adjustment module.

10 Thermal data

VEGAPULS 21, 31

Temperature class	**Permissible process temperature range on the antenna in zone 0 (EPL Ga)**	**Permissible ambient temperature range on the electronics housing in zone 0 (EPL Ga)**
T4 … T1	-40 … +80 °C	-40 … +70 °C

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Printing date:

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IECEx

Safety instructions
VEGAPULS 21, 31

Intrinsic safety "i"

Two-wire 4 … 20 mA/HART

Document ID: 62414

c-FM-us

Contents

Supplementary documentation:

- Operating Instructions VEGAPULS 21, 31
- Certificate of Conformity FM20CA0003X, FM20US0007X (Document ID: 62417)

Editing status: 2019-10-21

62414-EN-200525

1 Area of applicability

These safety instructions apply to the VEGAPULS 21, 31 of type series:

- VEGAPULS 21
- VEGAPULS 31

With the electronics versions:

- H - Two-wire 4 … 20 mA/HART

According to Certificate of Conformity FM20CA0003X, FM20US0007X (certificate number on the type label) and for all instruments with safety instruction 62414.

The classification as well as the respective standards are stated in the Certificate of Conformity.

Type of protection marking:

- Intrinsic safe for Cl I, Div1, Gp ABCD T4
- Ex ia IIC T4 Ga, Ga/Gb
- Cl I, Zn 0, 0/1, AEx ia IIC T4 Ga, Ga/Gb

2 Device configuration/-properties

The detailed device configurations can be retrieved using the serial number search on our homepage.

Move to "www.vega.com" and enter in the search field the serial number of your instrument.

Alternatively, you can find all via your smartphone:

- Download the VEGA Tools app from the "*Apple App Store*", "*Google Play Store*" or "*Baidu Store*"
- Scan the DataMatrix code on the type label of the instrument or
- Enter the serial number manually in the app

3 General information

The VEGAPULS 21, 31 in ignition protection type intrinsic safety "i" are used for detection of the distance between product surface and sensor by means of high frequency, electromagnetic waves in the GHz range.

The electronics uses the running time of the signals reflected by the product surface to calculate the distance to the product surface.

The VEGAPULS 21, 31 consist of an electronics housing, a process connection element and a sensor or an antenna.

VEGAPULS 31 is equipped with an additional display and adjustment unit.

Zone application:
The VEGAPULS 21, 31 are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGAPULS 21, 31 are suitable for applications requiring EPL Ga, EPL Ga/Gb or EPL Gb instruments.

Division applications:
The VEGAPULS 21, 31 are suitable for applications in hazardous atmospheres of gas groups A, B, C and D.

The VEGAPULS 21, 31 are suitable for applications requiring Division 1 instruments, gas explosion protection.

4 Application area

EPL Ga instrument
The VEGAPULS 21, 31 with the mechanical fixing element are installed in hazardous areas of zone 0 requiring EPL Ga instruments.

EPL Ga/Gb instrument
The VEGAPULS 21, 31 with mechanical fixing element are installed in hazardous areas of zone 1 requiring EPL Gb instruments. The mechanical fixing element, process connection element is installed in the separating wall, which separates areas requiring EPL Gb or EPL Ga instruments. The sensor measuring system is installed in hazardous areas of zone 0 requiring EPL Ga instruments.

Division 1 instruments
The VEGAPULS 21, 31 with the mechanical fixing element are installed in explosive areas requiring Division 1 instruments.

5 Specific conditions of use ("X" identification)

The following overview is listing all special properties of VEGAPULS 21, 31, which make a labelling with the symbol "X" behind the certificate number necessary.

Electrostatic charging (ESD)
You can find the details in chapter "*Electrostatic charging (ESD)*" of these safety instructions.

Ambient temperature
You can find the details in chapter "*Thermal data*" of these safety instructions.

6 Additional instructions for safe operation

- For process pressures outside the standard atmospheric conditions of 80 kPa (0.8 bar) to 110 kPa (1.1 bar) additional requirements can be valid.

Connection conditions
- Unused openings must be covered. The red thread or/dust covers screwed in when the instruments are shipped (depending on the version) must be removed before setup and replaced by cable entries or closing screws suitable for the respective ignition protection type and IP protection.
- If the temperature at the entry parts exceeds 70 °C, temperature-resistant connection cables must be used
- Metal cable glands must not be used
- If necessary, a suitable overvoltage arrester can be connected in front of the VEGAPULS 21, 31

7 Important information for mounting and maintenance

General instructions
The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:

- The staff must be qualified according the respective tasks
- The staff must be trained in explosion protection
- The staff must be familiar with the respectively valid regulations, e.g. planning and installation acc. to CEC or NEC
- Make sure when working on the instrument (mounting, installation, maintenance) that there is no explosive atmosphere present, the supply circuits should be voltage-free, if possible.

- The instrument has to be mounted according to the manufacturer specifications, the Certificate of Conformity and the valid regulations and standards
- Modifications on the instrument can influence the explosion protection and hence the safety
- Modifications must only be carried out by employees authorized by VEGA company
- Use only approved spare parts

Mounting

Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided
- If the device is used as a separating wall device, the operator must observe the applicable installation regulations.
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label

Maintenance

To ensure the functionality of the device, periodic visual inspection is recommended for:

- Secure mounting
- No mechanical damages or corrosion
- Worn or otherwise damaged cables
- No loose connections of the line connections, equipotential bonding connections
- Correct and clearly marked cable connections

8 Electrostatic charging (ESD)

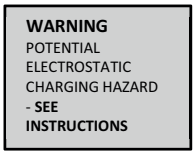
Take note in case of danger of electrostatic charges:

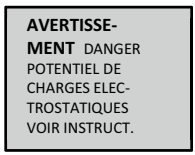
- Avoid friction on the surfaces
- Do not dry clean the surfaces

The instruments must be mounted/installed in such a way that the following can be ruled out:

- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing

The warning label indicates danger:





For media with a conductivity smaller than 10^{-8} S/m applies:

- The level measuring instrument must not be used in highly charge generating processes, e.g. mechanical friction and separation processes, spraying of electrons, etc.
- In particular, the level measuring instrument must not be mounted in a pneumatic conveying flow

9 Electrical data

VEGAPULS 21, 31

Supply and signal circuit:	
Terminals 1[+], 2[-] in electronics compartment	In type of protection intrinsic safety Ex ia IIC
	For connection to a certified, intrinsically safe circuit. $U_i \leq 30$ V DC $I_i \leq 131$ mA $P_i \leq 983$ mW
	The effective internal capacitance C_i is negligibly small. The effective internal inductance L_i is negligibly small.

VEGAPULS 31

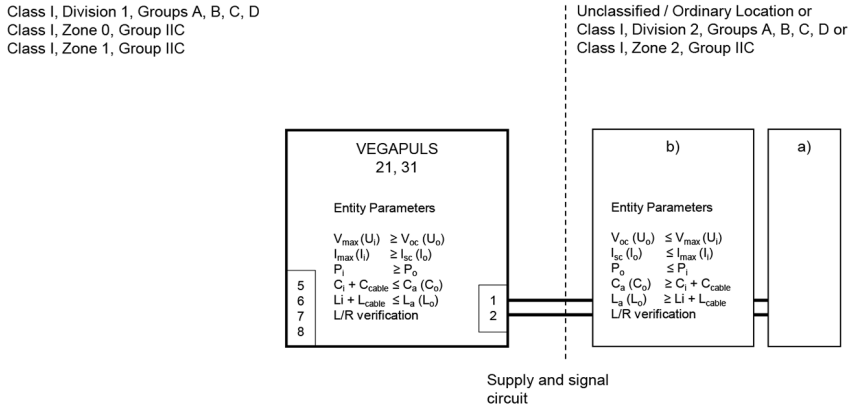
Display and adjustment circuit:	
Plug connector in the electronics compartment	In type of protection intrinsic safety Ex ia IIC
	Only for connection to the corresponding display and adjustment module.

10 Thermal data

VEGAPULS 21, 31

Temperature class	**Permissible process temperature range at the antenna in Zone 0 (EPL Ga) or in Division 1**	**Permissible ambient temperature range on the electronics housing in zone 0 (EPL Ga) or in Division 1**
T4 … T1	-40 … +80 °C	-40 … +70 °C

11 Installation Control Drawing



a) Control Room (Um ≤ 250 V)
b) Associated Apparatus

NOTES:

1. The Entity Concept allows the interconnection of suitable approved Intrinsically safe devices with entity parameters not specifically examined in combination as a system when:
   - U_o or V_{oc} or V_t ≤ U_i or V_{max}
   - I_o or I_{sc} or I_t ≤ I_i or I_{max}
   - P_o ≤ P_i
   - C_a or C_o ≥ C_i + C_{cable}
   - L_a or L_o ≥ Li + L_{cable}
2. Control equipment connected to the Associated Apparatus shall not use or generate more than 250 V_{rms} or V_{dc}.
3. Installation should be in accordance with ANSI/ISA-RP12.06.01 “Intrinsic Safety Wiring Methods for Hazardous (Classified) Locations Instrumentation” and the Canadian Electrical Code for Canada or the National Electrical Code for the US.
4. The configuration of associated Apparatus shall be approved under Entity Concept.
5. Associated Apparatus manufacturer’s installation control drawing shall be followed when installing this equipment.
6. The VEGAPULS 21, 31 are approved for Class I, Zone 0 and Division 1 applications.
   If connecting [Ex ib]/[AEx ib] Associated Apparatus to the VEGAPULS 21, 31, the above system is only suitable for Class 1, Zone 1, or Division 2 hazardous (classified) locations, and is not suitable for Class I. Zone 0, or Division 1 hazardous (classified) locations.
7. When cable parameters are unknown, the following may be used: Capacitance = 200 pF/m (60 pF/ft); Inductance = 0.66 µH/m (0.20 µH/ft)
8. Resistance between intrinsically safe ground and earth ground must be less than one Ohm.
9. No revision to drawing without prior Agency Approval.
10. Warning: Substitution of components may impair suitability for intrinsic safely and hazardous locations.

Printing date:

62414-EN-200525

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Safety instructions
VEGAPULS 21, 31

Intrinsic safety "i"

Two-wire 4 … 20 mA/HART

Document ID: 62414

Contents

Supplementary documentation:

- Operating Instructions VEGAPULS 21, 31
- Certificate of Conformity CSA 19CA80000123X (Document ID: 62418)

Editing status: 2019-10-21

62414-EN-200626

c-CSA-us

1 Area of applicability

These safety instructions apply to the VEGAPULS 21, 31 of type series:

- VEGAPULS 21
- VEGAPULS 31

With the electronics versions:

- H - Two-wire 4 … 20 mA/HART

According to Certificate of Conformity CSA 19CA80000123X (certificate number on the type label) and for all instruments with safety instruction 62414.

The classification as well as the respective standards are stated in the Certificate of Conformity.

Type of protection marking:

- Intrinsic safe for Cl I, Div1, Gp ABCD T4
- Ex ia IIC T4 Ga, Ga/Gb
- Cl I, Zn 0, 0/1, AEx ia IIC T4 Ga, Ga/Gb

2 Device configuration/-properties

The detailed device configurations can be retrieved using the serial number search on our homepage.

Move to "www.vega.com" and enter in the search field the serial number of your instrument.

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- Enter the serial number manually in the app

3 General information

The VEGAPULS 21, 31 in ignition protection type intrinsic safety "i" are used for detection of the distance between product surface and sensor by means of high frequency, electromagnetic waves in the GHz range.

The electronics uses the running time of the signals reflected by the product surface to calculate the distance to the product surface.

The VEGAPULS 21, 31 consist of an electronics housing, a process connection element and a sensor or an antenna.

VEGAPULS 31 is equipped with an additional display and adjustment unit.

Zone application:
The VEGAPULS 21, 31 are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGAPULS 21, 31 are suitable for applications requiring EPL Ga, EPL Ga/Gb or EPL Gb instruments.

Division applications:
The VEGAPULS 21, 31 are suitable for applications in hazardous atmospheres of gas groups A, B, C and D.

The VEGAPULS 21, 31 are suitable for applications requiring Division 1 instruments, gas explosion protection.

4 Application area

EPL Ga instrument
The VEGAPULS 21, 31 with the mechanical fixing element are installed in hazardous areas of zone 0 requiring EPL Ga instruments.

EPL Ga/Gb instrument
The VEGAPULS 21, 31 with mechanical fixing element are installed in hazardous areas of zone 1 requiring EPL Gb instruments. The mechanical fixing element, process connection element is installed in the separating wall, which separates areas requiring EPL Gb or EPL Ga instruments. The sensor measuring system is installed in hazardous areas of zone 0 requiring EPL Ga instruments.

Division 1 instruments
The VEGAPULS 21, 31 with the mechanical fixing element are installed in explosive areas requiring Division 1 instruments.

5 Specific conditions of use ("X" identification)

The following overview is listing all special properties of VEGAPULS 21, 31, which make a labelling with the symbol "X" behind the certificate number necessary.

Electrostatic charging (ESD)
You can find the details in chapter "*Electrostatic charging (ESD)*" of these safety instructions.

Ambient temperature
You can find the details in chapter "*Thermal data*" of these safety instructions.

6 Additional instructions for safe operation

- For process pressures outside the standard atmospheric conditions of 80 kPa (0.8 bar) to 110 kPa (1.1 bar) additional requirements can be valid.

Connection conditions
- Unused openings must be covered. The red thread or/dust covers screwed in when the instruments are shipped (depending on the version) must be removed before setup and replaced by cable entries or closing screws suitable for the respective ignition protection type and IP protection.
- If the temperature at the entry parts exceeds 70 °C, temperature-resistant connection cables must be used
- Metal cable glands must not be used
- If necessary, a suitable overvoltage arrester can be connected in front of the VEGAPULS 21, 31

7 Important information for mounting and maintenance

General instructions
The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:

- The staff must be qualified according the respective tasks
- The staff must be trained in explosion protection
- The staff must be familiar with the respectively valid regulations, e.g. planning and installation acc. to CEC or NEC
- Make sure when working on the instrument (mounting, installation, maintenance) that there is no explosive atmosphere present, the supply circuits should be voltage-free, if possible.

- The instrument has to be mounted according to the manufacturer specifications, the Certificate of Conformity and the valid regulations and standards
- Modifications on the instrument can influence the explosion protection and hence the safety, therefore repairs are not permitted to be conducted by the end user
- Modifications must only be carried out by employees authorized by VEGA company
- Use only approved spare parts

Mounting
Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided
- If the device is used as a separating wall device, the operator must observe the applicable installation regulations.
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label

Maintenance
To ensure the functionality of the device, periodic visual inspection is recommended for:

- Secure mounting
- No mechanical damages or corrosion
- Worn or otherwise damaged cables
- No loose connections of the line connections, equipotential bonding connections
- Correct and clearly marked cable connections

8 Electrostatic charging (ESD)

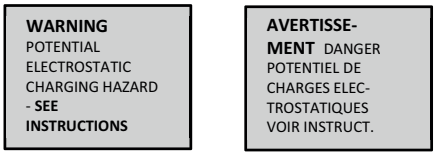
Take note in case of danger of electrostatic charges:

- Avoid friction on the surfaces
- Do not dry clean the surfaces

The instruments must be mounted/installed in such a way that the following can be ruled out:

- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing

The warning label indicates danger:



For media with a conductivity smaller than 10^{-8} S/m applies:

- The level measuring instrument must not be used in highly charge generating processes, e.g. mechanical friction and separation processes, spraying of electrons, etc.
- In particular, the level measuring instrument must not be mounted in a pneumatic conveying flow

9 Electrical data

VEGAPULS 21, 31

Supply and signal circuit:	
Terminals 1[+], 2[-] in electronics compartment	In type of protection intrinsic safety Ex ia IIC
	For connection to a certified, intrinsically safe circuit. $U_i \leq 30$ V DC $I_i \leq 131$ mA $P_i \leq 983$ mW
	The effective internal capacitance C_i is negligibly small. The effective internal inductance L_i is negligibly small.

VEGAPULS 31

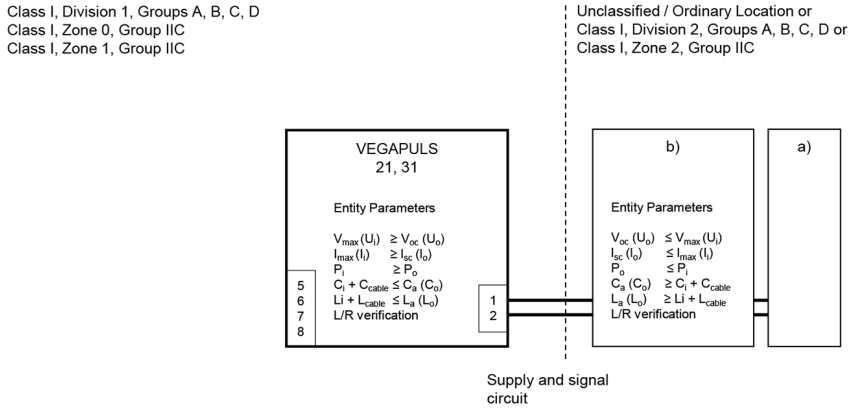
Display and adjustment circuit:	
Plug connector in the electronics compartment	In type of protection intrinsic safety Ex ia IIC
	Only for connection to the corresponding display and adjustment module.

10 Thermal data

VEGAPULS 21, 31

Temperature class	**Permissible process temperature range at the antenna in Zone 0 (EPL Ga) or in Division 1**	**Permissible ambient temperature range on the electronics housing in zone 0 (EPL Ga) or in Division 1**
T4 … T1	-40 … +80 °C	-40 … +70 °C

11 Installation Control Drawing



a) Control Room (Um ≤ 250 V)
b) Associated Apparatus

NOTES:

1. The Entity Concept allows the interconnection of suitable approved Intrinsically safe devices with entity parameters not specifically examined in combination as a system when:
   - U_o or V_{oc} or $V_t \leq U_i$ or V_{max}
   - I_o or I_{sc} or $I_t \leq I_i$ or I_{max}
   - $P_o \leq P_i$
   - C_a or $C_o \geq C_i + C_{cable}$
   - L_a or $L_o \geq Li + L_{cable}$
2. Control equipment connected to the Associated Apparatus shall not use or generate more than 250 V_{rms} or V_{dc}.
3. Installation should be in accordance with ANSI/ISA-RP12.06.01 “Intrinsic Safety Wiring Methods for Hazardous (Classified) Locations Instrumentation” and the Canadian Electrical Code for Canada or the National Electrical Code for the US.
4. The configuration of associated Apparatus shall be approved under Entity Concept.
5. Associated Apparatus manufacturer’s installation control drawing shall be followed when installing this equipment.
6. The VEGAPULS 21, 31 are approved for Class I, Zone 0 and Division 1 applications.
   If connecting [Ex ib]/[AEx ib] Associated Apparatus to the VEGAPULS 21, 31, the above system is only suitable for Class 1, Zone 1, or Division 2 hazardous (classified) locations, and is not suitable for Class I. Zone 0, or Division 1 hazardous (classified) locations.
7. When cable parameters are unknown, the following may be used: Capacitance = 200 pF/m (60 pF/ft); Inductance = 0.66 µH/m (0.20 µH/ft)
8. Resistance between intrinsically safe ground and earth ground must be less than one Ohm.
9. No revision to drawing without prior Agency Approval.
10. Warning: Substitution of components may impair suitability for intrinsic safely and hazardous locations.

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