



Safety instructions

ATEX / UKEX

VEGAPULS 6X

Dust ignition protection



Document ID: 66216



VEGA

1 ATEX..... 3
2 UKEX27

- EU type approval certificate CSANe 21 ATEX 1322 X (Document ID: 66215)
- UK-Type Examination Certificate CSAE 22UKEX1193X (Document ID: 1013142)

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Safety instructions

VEGAPULS 6X

Dust ignition protection

Two-wire 4 ... 20 mA/HART

Two-wire 4 ... 20 mA/HART with second current
output 4 ... 20 mA

Two-wire 4 ... 20 mA/HART with overvoltage
arrester



CE 0044



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Supplementary documentation:

- Operating Instructions VEGAPULS 6X
- Quick setup guide VEGAPULS 6X
- EU type approval certificate CSANe 21 ATEX 1322 X (Document ID: 66215)
- EU declaration of conformity (Document ID: 66323)
- SIL Safety Manual (Document ID: 66494)
- Further related documentation is available by entering the serial number of the device in the search field on "www.vega.com"

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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 explosionsfarliga områden
DA	Sikkerhedsforskrifter til anvendelse i explosionsfarlig atmosfære
FI	Turvallisuusohjeet räjähdysvaarallisissa tiloissa käytettä 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 français 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 Scope

These safety instructions apply to the radar sensors VEGAPULS 6X of type series:

- PS6X(*).a-b-c-de-f-g-hi-j-k-l-H/9/A-*R-p-q-r-s-t-u
- PS6X(*).a-b-c-de-f-g-hi-j-k-l-H/9/A-*J-p-q-r-s-t-u

With the electronics versions:

- H - Two-wire 4 ... 20 mA/HART
- 9 - Two-wire 4 ... 20 mA/HART with second current output 4 ... 20 mA
- A - Two-wire 4 ... 20 mA/HART with overvoltage arrester

The VEGAPULS 6X are approved acc. to ATEX:

CSANe 21 ATEX 1322 X (certificate number on the type label)

Standards on which the certification is based:

- EN IEC 60079-0: 2018
- IEC 60079-26: 2021
- IEC 60079-31: 2022

Type of protection marking:

- Electronics H/9
 - II 1D Ex ta IIIC T* Da
 - II 1/2D Ex ta/tb IIIC T* Da/Db
 - IP66
- Electronics A
 - II 1/2D Ex ta/tb IIIC T* Da/Db
 - II 2D Ex tb IIIC T* Db
 - IP66

2 Type code specification

In the following, all versions are called VEGAPULS 6X. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

VEGAPULS 6X with type code PS6X(*).a-b-c-de-f-g-hi-j-k-l-m-no-p-q-r-s-t-u

a	Generation
2	Second generation

b	Application
*	One-digit code for preselection, not relevant for approval

c	Radar technology
W	80 GHz

de	Process fitting / Material
XX	universal, plastic horn antenna / PP/PBT
XC	Mounting strap, length: 170 mm / 316L/316L
XD	Mounting strap, length: 300 mm / 316L/316L
**	Other process fittings that comply with national or international standards

f	Antenna version
B	Plastic horn antenna
T	Thread with integrated antenna system
F	Flange with plastic plating
C	Flange with lens antenna
H	Hygienic fitting
G	with horn antenna (ø 19 mm)
K	with horn antenna (ø 25 mm)
L	with horn antenna (ø 40 mm)
N	with horn antenna (ø 48 mm)
D	with horn antenna (ø 75 mm)

g	Additional equipment
X	without
K	with rinsing air connection
V	with purging connection with reflux valve
1	Antenna system DD-lacquered
N	Device Norsok lacquered

hi	Material / Seal / Process temperature
AA	PEEK / FKM (SHS FPM 70C3 GLT) / -40 ... +150 °C
AB	PEEK / FKM (SHS FPM 70C3 GLT) / -40 ... +200 °C
AC	PEEK / FFKM (Kalrez 6230) / -15 ... +150 °C
AD	PEEK / FFKM (Kalrez 6230) / -15 ... +250 °C
AE	PEEK / FFKM (Kalrez 6375) / -20 ... +150 °C
AF	PEEK / FFKM (Kalrez 6375) / -20 ... +250 °C
AG	PEEK / FFKM (Perlast G75B) / -15 ... +150 °C
AH	PEEK / FFKM (Perlast G75B) / -15 ... +250 °C
AJ	PEEK / FFKM (Perlast G74S) / -15 ... +150 °C
AK	PEEK / FFKM (Perlast G74S) / -15 ... +250 °C
AL	PEEK / EPDM (COG AP302) / -40 ... +150 °C (for lens antennas)
AL	PEEK / EPDM (A+P 70.10-02) / -55 ... +150 °C (for threaded version)
AT	PP / PP / -40 ... +80 °C
AU	PP / FKM (SHS FPM 70C3 GLT) / -40 ... +80 °C
AV	PP / EPDM (COG AP310) / -40 ... +80 °C
AW	PTFE / PTFE / -60 ... +150 °C
A4	PTFE / PTFE / -60 ... +200 °C
AX	PTFE / PTFE / -196 ... +200 °C
AY	PTFE (8 mm) / PTFE / -60 ... +150 °C

hi	Material / Seal / Process temperature
A5	PTFE (8 mm) / PTFE / -60 ... +200 °C
AZ	PTFE (8 mm) / PTFE / -196 ... +200 °C
A2	PFA (8 mm) / PFA / -60 ... +150 °C
A3	PFA (8 mm) / PFA / -60 ... +200 °C
AM	PVDF / FKM / -40 ... +8 °C
AN	Ceramic / graphite / -196 ... +450 °C
AP	Ceramic / FKM (PPE V71C) / -40 ... +150 °C
AQ	Ceramic / FFKM (Kalrez 6375) / -20 ... +250 °C
AR	Ceramic / FFKM (Perlast G75B) / -15 ... +250 °C
AS	Ceramic / EPDM / -40 ... +150 °C
A8	PEEK / PEEK / -40 ... +150 °C
A6	PEEK / FKM (COG Vi780) / -40 ... +150 °C
A7	PEEK / EPDM (Freudenberg 291) / -20 ... +150 °C
A1	PTFE / FFKM (Kalrez 6230) / -15 ... +150 °C
A9	PTFE / EPDM (Freudenberg 291) / -20 ... +150 °C

j	Housing / Protection
A	Aluminium single chamber / IP66/IP68 (0.2 bar)
H	Special colour Aluminium single chamber / IP66/IP68 (0.2 bar)
D	Aluminium double chamber / IP66/IP68 (0.2 bar)
S	Special colour Aluminium double chamber / IP66/IP68 (0.2 bar)
V	Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar)
W	Stainless steel double chamber / IP66/IP68 (0.2 bar)



k	Cable entry / Connection
D	M20 x 1.5 / Blind plug
1	M20 x 1.5 / without
N	½ NPT / Blind plug
Q	½ NPT / without
*	Other certified connection or cable gland suitable for the application

l	Display, adjustment or radio module
X	without display, adjustment or radio module, standard lid
A	Display and adjustment module PLICSCOM
F	without display, adjustment or radio module, lid with inspection window
B	Display/adjustment module PLICSCOM, laterally mounted
K	Display/adjustment module PLICSCOM, with Bluetooth
L	Display/adjustment module PLICSCOM, laterally mounted; with Bluetooth

m	Electronics
H	Two-wire 4 ... 20 mA/HART
A	Two-wire 4 ... 20 mA/HART with overvoltage arrester
9	Two-wire 4 ... 20 mA/HART with second current output 4 ... 20 mA
no	Explosion protection
*R	Dust ignition protection by enclosure
*J	Flameproof enclosure + Dust ignition protection by enclosure
p	Functional safety SIL (IEC 61508)
X	without
*	with
q	IT Security (IEC 62443-4-2)
X	without
*	with
r	Overfill protection
X	without
*	with
s	Food/pharmaceutical certificate
X	without
*	with
t	Ship approval
X	without
*	with
u	Secondary Line of Defense
X	without
S	with

3 Application area

Overview of the different application areas:

VEGA Instrument	3D (EPL Dc)	2D (EPL Db)	1/2D (EPL Da/Db)	1D (EPL Da)
Ex Zone 22 				

VEGA Instrument	3D (EPL Dc)	2D (EPL Db)	1/2D (EPL Da/Db)	1D (EPL Da)
Ex Zone 21 				
Ex Zone 20 				

Application area of VEGAPULS 6X (electronics version H/9):

Type code	Explosion group	Type of protection marking
Electronics version "H/9" - Two-wire 4 ... 20 mA/HART		
PS6X(*).2*W*****H/9*R*****	IIIC	II 1D, 1/2D Ex ta, ta/tb IIIC T* Da, Da/Db IP66
PS6X(*).2*W*****H/9*J*****	IIA, IIB, IIC IIIA, IIIB, IIIC	II 1/2G, 2G Ex db IIC T6...T1 Ga/Gb, Gb II 1D, 1/2D Ex ta, ta/tb IIIC T* Da, Da/Db IP66

Application area of VEGAPULS 6X (electronics version A):

Type code	Explosion group	Type of protection marking
Electronics version "A" - Two-wire 4 ... 20 mA/HART with overvoltage arrester		
PS6X(*).2*W*****A*R*****	IIIC	II 1/2D, 2D Ex ta/tb, tb IIIC T* Da/Db, Db IP66
PS6X(*).2*W*****A*J*****	IIA, IIB, IIC IIIA, IIIB, IIIC	II 1/2G, 2G Ex db IIC T6...T1 Ga/Gb, Gb II 1/2D, 2D Ex ta/tb, tb IIIC T* Da/Db, Db IP66

VEGAPULS 6X without overvoltage arrester: PS6X(*).2*W*****H/9*****

The voltage resistance against ground is min. 500 V_{eff}.

VEGAPULS 6X with overvoltage arrester: PS6X(*).2*W*****A*****

The built-in overvoltage arrester type Bourns 2036-60 has the following characteristic values:

DC Sparkover = 600 V ± 20 % @ 100 V/s

Impulse Sparkover = 850 V @ 100 V/μs

Impulse Sparkover = 1100 V @ 1000 V/μs

Further characteristic data can be found in the data sheet of the Bourns 2036-60.

The voltage resistance against ground is min. 340 V_{eff}.

4 Specific conditions of use ("X" identification)

The following list describes the special operating conditions of VEGAPULS 6X.

- In the application the following applies to the radar sensors VEGAPULS 6X in the versions with Aluminium/Titanium:

- Installation must be carried out in such a way that the generation of sparks as a result of impact and friction processes between Aluminium/Titanium and steel is excluded. This excludes stainless steel without rust particles.
- Certain components of the radar sensor VEGAPULS 6X can charge electrostatically. These include: Plastic housings, non-grounded metal parts, plastic antennas. For details, refer to chapter "*Electrostatic charge (ESD)*" of these safety instructions.
- To avoid the risk of electrostatic charging of metal parts, the VEGAPULS 6X must be connected to the potential equalization (transition resistance $\leq 1 \text{ M}\Omega$).
- All parts of VEGAPULS 6X in contact with the medium must only be used in such a medium against which the materials are sufficiently resistant.
- VEGAPULS 6X with rinsing connection: It must be ensured that the IP67 degree of protection is provided at the connection to the reflux valve when used as category 1/2G equipment. After removing the reflux valve or the rinsing facility on the reflux valve, the opening must be closed with a suitable screw plug so that the IP67 degree of protection is maintained.
- VEGAPULS 6X with swivelling holder: It must be ensured that the IP67 degree of protection is maintained when operating as category 1/2G equipment after aligning the antenna using the swivelling holder and after screwing on the tension flange.
- Ambient temperature
 - You can find the details in chapter "*Thermal data*" of these safety instructions.

5 Installation

- The installation of the device must only be carried out by qualified personnel.
- The staff must be trained in explosion protection and familiar with the relevant valid regulations.
- Make sure when working on the instrument that there is no explosive atmosphere present. The supply circuits should be voltage-free, if possible.
- Install the instrument in accordance with the manufacturer specification and the applicable national regulations, e.g. planning and installation in accordance with IEC/EN 60079-14.
- The devices must be integrated into the local potential equalization.
- If grounding of the cable screening is necessary, this must be carried out acc. to the valid standards and regulations, e.g. acc. to IEC/EN 60079-14.
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label.

For device category 2 the following process pressures are applicable depending on the antenna version:

	Process pressure
Plastic horn antenna, with inspection window	Compression flange -1 ... +2 bar Adapter flange -1 ... +1 bar
Thread with integrated horn antenna, with inspection window	-1 ... +40 bar
Flange with encapsulated antenna system, with inspection window	-1 ... +25 bar
Flange with lens antenna, with inspection window	-1 ... +3 bar
Hygienic version with thread	-1 ... +25 bar
Hygienic version with tension flange or compression nut	-1 ... +16 bar
Horn antenna	-1 ... +100 bar
Horn antenna for high temperature	-1 ... +160 bar
PVDF version with thread	-1 ... +3 bar

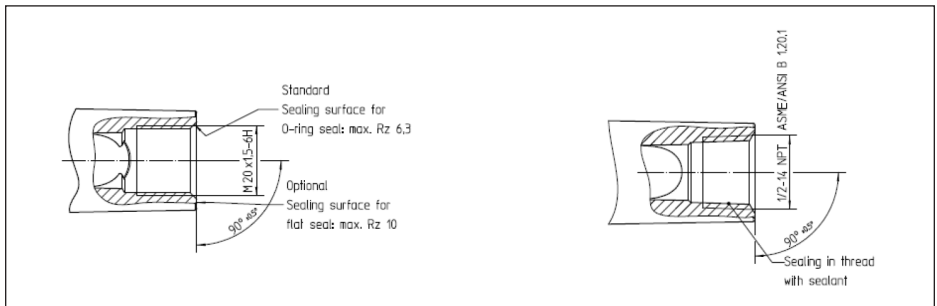
Cable glands, threaded openings

Type	Thread	Cable diameter [mm]	Torques [Nm]
Hummel EXIOS A2F 1.608.2003.50	M20 x 1.5	6 ... 12 mm	8
Hummel EXIOS A2F 1.608.1203.70	½ NPT	6 ... 12 mm	8
Hummel EXIOS MZ 1.6Z5.2000.51	M20 x 1.5	9 ... 13 mm	8
Hummel EXIOS MZ 1.6Z5.1200.70	½ NPT	9 ... 13 mm	8

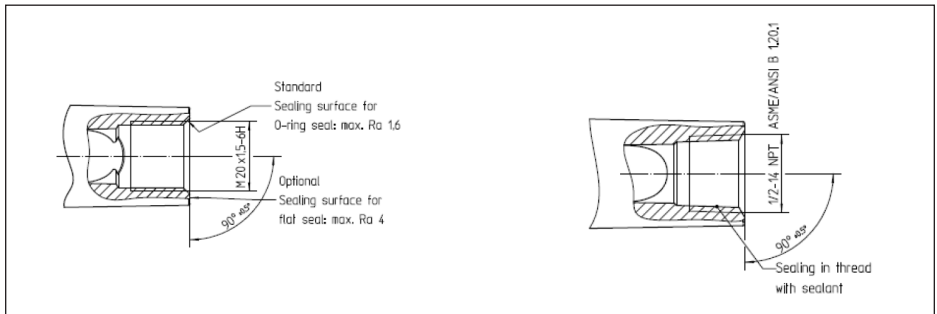
The specified torques are test torques and can only be regarded as reference values. The manufacturer's mounting instructions provided must be observed.

If suitable cable glands or cable insertion possibilities not included in the scope of supply are used, these must be compatible with the threaded openings.

Aluminium housing with M20 x 1.5 thread, ½ NPT thread



Stainless-steel housing (fine cast) with M20 x 1.5 thread, ½ NPT thread

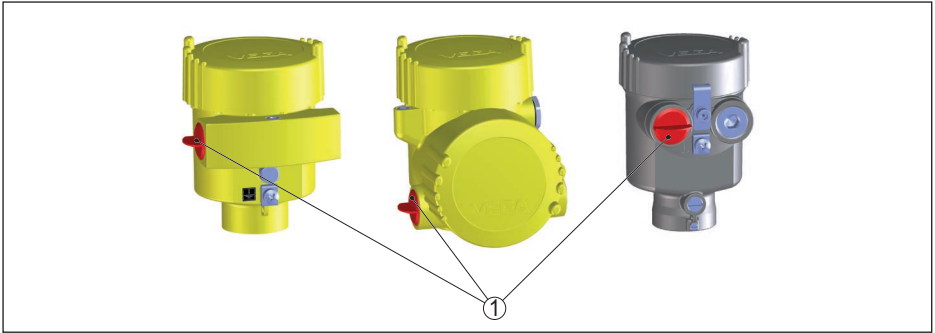


Maintenance

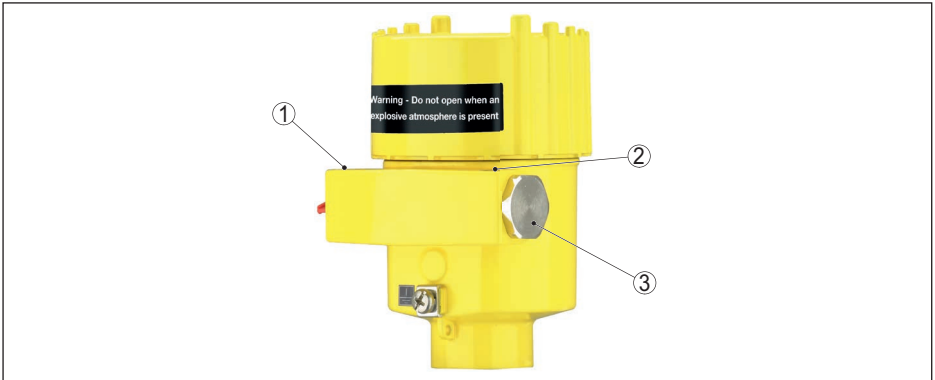
To ensure the functionality of the device, periodic visual inspection is recommended for:

- 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

The parts of the VEGAPULS 6X being in contact with flammable media during operation must be included in the periodic overpressure test of the plant.



1 Red threaded or dust protection cap



1 Label: Type and size of the thread ½-14 NPT or M20 x 1.5

2 Label: Type and size of the thread ½-14 NPT or M20 x 1.5

3 Screw plug

6 Operation

- Do not operate the device outside the electrical and thermal specifications given in this safety instruction
- Modifications on the instrument can influence the explosion protection and hence the safety
- Modifications must only be carried out by employees authorized by VEGA
- Note the relation between process temperature on the sensor/antenna and the permissible ambient temperature on the electronics housing. For permissible temperatures, see the respective temperature tables. See chapter "Thermal data".
- The information on mechanical wear in the operating instructions must be observed
- The continuous operating temperature of the connection cable must be suitable for the temperature range of the application
- Only original spare parts or spare parts approved for the purpose may be used for repairs
- The VEGAPULS 6X must be connected via suitable cable gland or conduit systems that are in conformity with the requirements of the standards and provided with a separate type approval certificate. When connecting the VEGAPULS 6X to conduit systems, the corresponding sealing facility must be connected directly to the housing. Keep the type and size of the threads in mind: The thread names are mentioned on the type label

- Unused openings must be covered according to the standards. 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.
- The connection cable of VEGAPULS 6X has to be wired fix and in such a way that damages can be excluded
- Lids must not be opened if there is a hazardous atmosphere. The housing lids are marked with the warning label:

WARNING - DO NOT OPEN WHEN AN
EXPLOSIVE ATMOSPHERE IS PRESENT

7 Electrostatic charging (ESD)

In case of instrument versions with electrostatically chargeable plastic parts, the danger of electrostatic charging and discharging must be taken into account!

The following parts can charge and discharge:

- Lacquered housing version or alternative special lacquering
- Plastic housing, plastic housing parts
- Plastic process fittings
- Plastic-coated process fittings and/or plastic-coated sensors
- Connection cable for separate versions
- Type label

Take note in case of danger of electrostatic charges:

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

The instruments must be 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:

WARNING - POTENTIAL ELECTROSTATIC
CHARGING HAZARD - SEE INSTRUCTIONS

8 Electrical data

For the VEGAPULS 6X in ignition protection type dust ignition protection by enclosure (IIIC) applies:

Electronics H/A

Supply and signal circuit: Terminals 1[+], 2[-]	Supply via a circuit with limited power (max. 100 W, see operating instructions), e.g. a class 2 power supply unit common in North America U = 12 ... 35 V DC
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Display and adjustment circuit

Terminals 5, 6, 7, 8	For connection to the circuit of the associated external indicating unit VEGADIS 81.
Indication and adjustment circuit: (spring contacts)	For connection to the display and adjustment module PLICSCOM.

Electronics 9

Power supply and signal circuit 1: terminals 1[+], 2[-]	U = 12 ... 35 V DC P _{max} < 2 W
Power supply and signal circuit 2: terminals 7[+], 8[-]	
Terminal 1, 2, 7, 8 in connection compartment of the double chamber housing	U = 12 ... 35 V DC P _{max} < 2 W
The max. power of the voltage supply of VEGAPULS PS6X(*) \cdot 2*W*****9*R/J***** installed in Zone 20 must not exceed 2 x 2 W.	

9 Thermal data

9.1 Thermal data - General regulations

The approval is valid under the following conditions:

- Compliance with the temperature ranges for the various versions as indicated in the tables below.
- Pressure: 80 kPa (0.8 bar) to 110 kPa (1.1 bar), and
- Air with an oxygen content of 21 % (v/v)

Additional measures are required for operation of the VEGAPULS 6X outside these conditions.

The operation of the VEGAPULS 6X outside the above conditions is the sole responsibility of the operator.

The thermal measurements for determining the following temperature tables were carried out for process temperatures above +150 °C with insulation. Thermal measurements up to +150 °C were carried out without insulation.

Data sheets of the insulation used:

		SiBa 20/150a/ALU50	SiBa/-a
Data sheet extract insulation		Aluminium foil embossed Basalt/silica compound fleece	Basalt/silica compound fleece
General technical data		SiBa 20/150a/ALU50 is a mechanically bonded needlefelt based on a mixture of endless drawn basalt fibres and silica fibres, laminated with an aluminium foil (thickness approx. 50 µm).	It is a mechanically bonded needlefelt based on a mixture of continuously drawn basalt fibres (approx. 70 %) and silica fibres (approx. 30 %).
Thickness	[mm]	approx. 20	approx. 20
Grammage	[kg/m ²]	approx. 3	approx. 3
Bulk density	[kg/m ³]	approx. 150	approx. 150

		SiBa 20/150a/ALU50	SiBa/-a
Heat resistance in the long term	[°C]	up to 700 Radiant heat on aluminium max. 250	up to 700
Heat resistance in the short term	[°C]	up to 700	up to 700
Cold resistance	[°C]	up to -40	up to -40
Heat conductivity	[W/mK]	0.05 (at 200 °C) 0.15 (at 600 °C)	0.05 (at 200 °C) 0.15 (at 600 °C)
Vibration behaviour		Resistant	Resistant
Physiological behaviour		Harmless	Harmless
Toxicological behaviour		Not dangerous	Not dangerous
Filament diameter	[µm]	> 6	> 6
Flammability		Fire-proof	Fire-proof

For measurements with insulation, a layer thickness of 8 cm SiBa 20/150a was applied. Looking from the surface of the tank, a 6 cm layer of SiBa 20/150a was first applied. A 2 cm layer of SiBa 20/150a/ALU50 was then finally applied on top of this layer.

9.2 Thermal data - Dust

Max. surface temperature T_{sur} of VEGAPULS 6X when used in explosive atmospheres:

EPL Da instrument - Complete device (antenna and housing) installed in Zone 20 (surrounded by 200 mm dust):

Max. permissible ambient/process temperature:	+65 °C
Surface temperature:	Ambient/Process temperature +35 K
Max. surface temperature:	= 65 °C + 35 K = 100 °C

EPL Db instrument - Complete device (antenna and housing) installed in Zone 21 (without dust layer):

Max. permissible ambient/process temperature:	+65 °C
Surface temperature:	Ambient/Process temperature +35 K
Max. surface temperature:	= 65 °C + 35 K = +100 °C

EPL Da/Db instrument - Housing installed in Zone 21 without dust layer, antenna installed in Zone 20:

VEGAPULS 6X with plastic horn antenna

PS6X(*).2*WB*AT/AU/AV*******

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-40 ... +76 °C	-40 ... +65 °C	Ambient temperature +35 K	+100 °C
Stainless steel V, W	-40 ... +76 °C	-40 ... +65 °C	Ambient temperature +35 K	+100 °C

VEGAPULS 6X with G1½, 1½ NPT, PVDF antenna

PS6X(*).2*WT*AM*******

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-40 ... +76 °C	-40 ... +65 °C	Ambient temperature +35 K	+100 °C
Stainless steel V, W	-40 ... +76 °C	-40 ... +65 °C	Ambient temperature +35 K	+100 °C

VEGAPULS 6X with flange with plastic plating or with integrated antenna system (threaded connection) for process temperatures up to max. +150 °C

PS6X(*).2*WF*AW/AY/AZ*******

PS6X(*).2*WT*AA/AC/AE/AG/AJ/AL*******

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +47 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +57 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +48 °C	Ambient temperature +35 K	+152 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +45 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +47 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +34 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AA** PEEK / FKM (SHS FPM 70C3-GLT) / **-40 ... +150 °C**
- **AC** PEEK / FFKM (Kalrez 6230) / **-15 ... +150 °C**
- **AE** PEEK / FFKM (Kalrez 6375) / **-20 ... +150 °C**
- **AG** PEEK / FFKM (Perlast G75B) / **-15 ... +150 °C**
- **AJ** PEEK / FFKM (Perlast G74S) / **-15 ... +150 °C**
- **AL** PEEK / EPDM (A+P 70.10-02) / **-55 ... +150 °C**
- **AW** PTFE / PTFE / **-60 ... +150 °C**
- **AY** PTFE (8 mm) / PTFE / **-60 ... +150 °C**
- **A2** PFA (8 mm) / PFA / **-60 ... +150 °C**

VEGAPULS 6X with flange with plastic plating or with integrated antenna system (threaded connection) or with lens antenna for process temperatures up to max. +195 °C

PS6X(*).2*WF*AX/AZ/A3/A4/A5*******

PS6X(*).2*WT*AB*******

PS6X(*).2*WC*AB*******

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +56 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +72 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +62 °C	Ambient temperature +35 K	+197 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +55 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +66 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +49 °C	Ambient temperature +35 K	+197 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AB** PEEK / FKM (SHS FPM 70C3-GLT) / **-40 ... +200 °C**
- **A4** PTFE / PTFE / **-60 ... +200 °C**
- **A5** PTFE (8 mm) / PTFE / **-60 ... +200 °C**
- **A3** PFA (8 mm) / PFA / **-60 ... +200 °C**

VEGAPULS 6X with lens antenna for process temperatures up to max. +150 °C

PS6X(*) .2*W**C*AA/AC/AE/AG/AJ/AL*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +51 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +65 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +58 °C	Ambient temperature +35 K	+152 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +50 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +57 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +48 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AA** PEEK / FKM (SHS FPM 70C3-GLT) / -40 ... +150 °C
- **AC** PEEK / FFKM (Kalrez 6230) / -15 ... +150 °C
- **AE** PEEK / FFKM (Kalrez 6375) / -20 ... +150 °C
- **AG** PEEK / FFKM (Perlast G75B) / -15 ... +150 °C
- **AJ** PEEK / FFKM (Perlast G74S) / -15 ... +150 °C
- **AL** PEEK / EPDM (A+P 70.10-02) / -40 ... +150 °C

VEGAPULS 6X with integrated antenna system (threaded connection) or with lens antenna for process temperatures up to max. +250 °C

PS6X(*) .2*W**C*AD/AF/AH/AK*****

PS6X(*) .2*W**T*AD/AF/AH/AK*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +54 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +69 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +63 °C	Ambient temperature +35 K	+197 °C
	-xx ... +250 °C	-40 ... +55 °C	Ambient temperature +35 K	+252 °C

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Stainless steel V, W	-xx ... +95 °C	-40 ... +53 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +65 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +56 °C	Ambient temperature +35 K	+197 °C
	-xx ... +250 °C	-40 ... +45 °C	Ambient temperature +35 K	+252 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AD** PEEK / FFKM (Kalrez 6230) / -15 ... +250 °C
- **AF** PEEK / FFKM (Kalrez 6375) / -20 ... +250 °C
- **AH** PEEK / FFKM (Perlast G75B) / -15 ... +250 °C
- **AK** PEEK / FFKM (Perlast G74S) / -15 ... +250 °C

VEGAPULS 6X flange with horn antenna for process temperatures up to max. +150 °C

PS6X(*).2*W**G/K/L/N/D*AP/AS*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +46 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +60 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +52 °C	Ambient temperature +35 K	+152 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +46 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +50 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +38 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AP** Ceramic / FKM (PPE V71C) / -40 ... +150 °C
- **AS** Ceramic / EPDM / -40 ... +150 °C

VEGAPULS 6X with hygiene for process temperatures up to max. +150 °C

PS6X(*).2*WXM/XN/XOT*AC/AJ/A6/A7*****

PS6X(*).2*W**H*AC/AJ/A6/A7*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +49 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +63 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +56 °C	Ambient temperature +35 K	+152 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +47 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +57 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +48 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AC** PEEK / FFKM (Kalrez 6230) / -15 ... +150 °C
- **AJ** PEEK / FFKM (Perlast G74S) / -15 ... +150 °C
- **A6** PEEK / FKM (PPE V70SW) / -10 ... +150 °C
- **A7** PEEK / EPDM (Freudenberg 291) / -20 ... +150 °C

VEGAPULS 6X with hygiene LA, LB for process temperatures up to max. +150 °C

PS6X(*).2*WLAH*A1/A9*****

PS6X(*).2*WLBH*A1/A9*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +47 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +57 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +48 °C	Ambient temperature +35 K	+152 °C

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Stainless steel V, W	-xx ... +95 °C	-40 ... +46 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +48 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +35 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **A1** PTFE / FFKM (Kalrez 6230) / -15 ... +150 °C
- **A9** PTFE / EPDM (Freudenberg 291) / -20 ... +150 °C

VEGAPULS 6X flange with horn antenna for process temperatures up to max. +250 °C

PS6X(*) .2*W**G/K/L/N/D*AQ/AR*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +51 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +65 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +59 °C	Ambient temperature +35 K	+197 °C
	-xx ... +250 °C	-40 ... +50 °C	Ambient temperature +35 K	+252 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +49 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +59 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +56 °C	Ambient temperature +35 K	+197 °C
	-xx ... +250 °C	-40 ... +47 °C	Ambient temperature +35 K	+252 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AQ** Ceramic / FFKM (Kalrez 6375) / -20 ... +250 °C
- **AR** Ceramic / FFKM (Perlast G75B) / -15 ... +250 °C

VEGAPULS 6X flange with horn antenna for process temperatures up to max. +440 °C

PS6X(*) .2*W**L/N/D*AN*****

Important note on the use of the following tables:

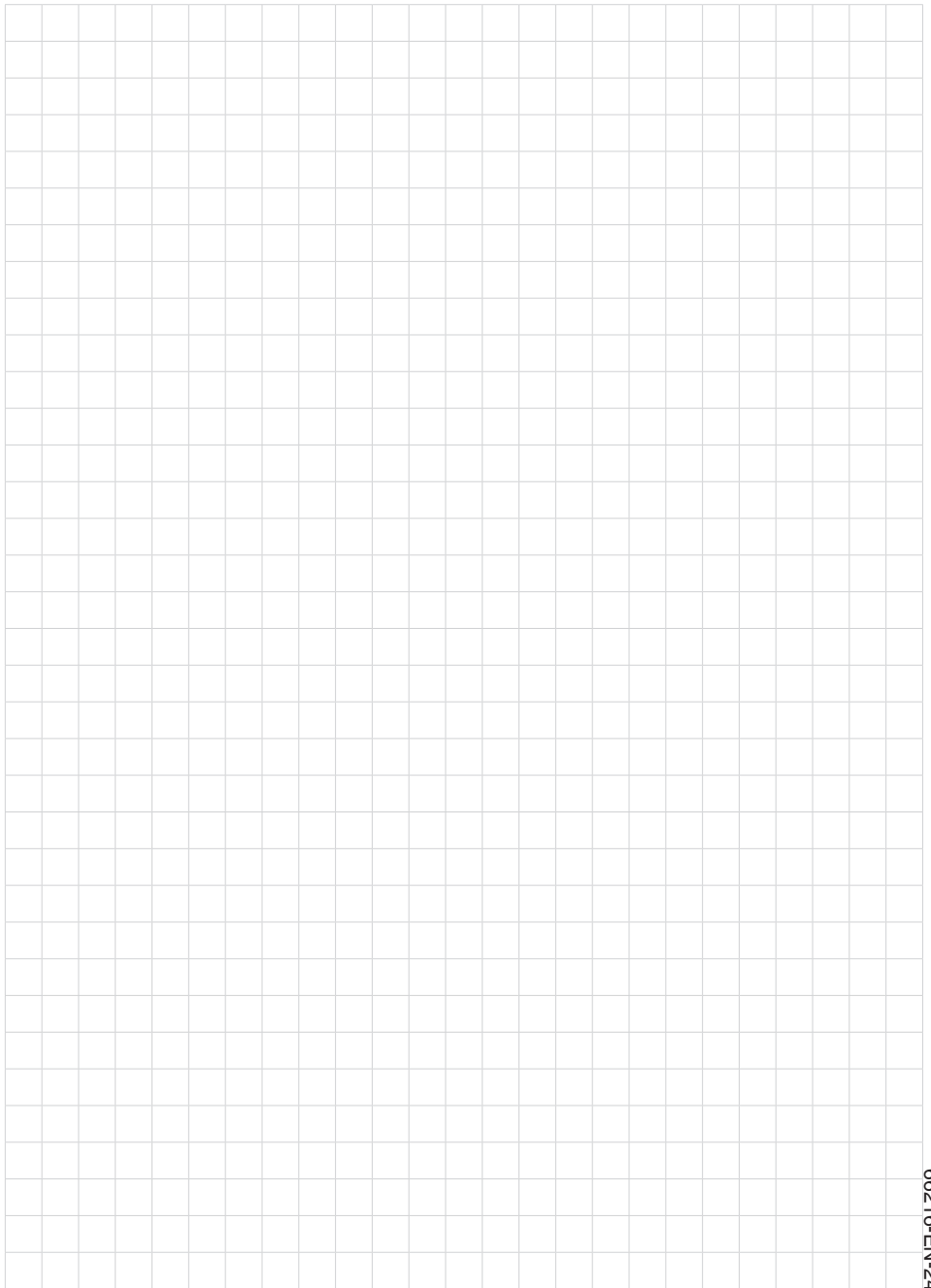
With a minimum process temperature of -196 °C, a minimum ambient temperature of -10 °C is still

permissible.

With a minimum process temperature of -60 °C, a minimum ambient temperature of -35 °C is still permissible.

With a minimum process temperature of -40 °C, a minimum ambient temperature of -40 °C is still permissible.

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-196 / -60 / -40 ... +95 °C	-10 / -35 / -40 ... +54 °C	Ambient temperature +35 K	+97 °C
	-196 / -60 / -40 ... +130 °C	-10 / -35 / -40 ... +72 °C	Ambient temperature +35 K	+132 °C
	-196 / -60 / -40 ... +195 °C	-10 / -35 / -40 ... +73 °C	Ambient temperature +35 K	+197 °C
	-196 / -60 / -40 ... +290 °C	-10 / -35 / -40 ... +69 °C	Ambient temperature +35 K	+292 °C
	-196 / -60 / -40 ... +440 °C	-10 / -35 / -40 ... +56 °C	Ambient temperature +35 K	+442 °C
Stainless steel V, W	-196 / -60 / -40 ... +95 °C	-10 / -35 / -40 ... +52 °C	Ambient temperature +35 K	+97 °C
	-196 / -60 / -40 ... +130 °C	-10 / -35 / -40 ... +68 °C	Ambient temperature +35 K	+132 °C
	-196 / -60 / -40 ... +195 °C	-10 / -35 / -40 ... +71 °C	Ambient temperature +35 K	+197 °C
	-196 / -60 / -40 ... +290 °C	-10 / -35 / -40 ... +66 °C	Ambient temperature +35 K	+292 °C
	-196 / -60 / -40 ... +440 °C	-10 / -35 / -40 ... +51 °C	Ambient temperature +35 K	+442 °C



Printing date:

VEGA

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

Subject to change without prior notice

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Safety instructions

VEGAPULS 6X

Dust ignition protection

Two-wire 4 ... 20 mA/HART

Two-wire 4 ... 20 mA/HART with second current output 4 ... 20 mA

Two-wire 4 ... 20 mA/HART with overvoltage arrester



UK
CA

0891



Document ID: 66216



VEGA

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Supplementary documentation:

- Operating Instructions VEGAPULS 6X
- Quick setup guide VEGAPULS 6X
- UK-Type Examination Certificate CSAE 22UKEX1193X (Document ID: 1013141)
- UK Declaration of Conformity (Document ID: 1012814)
- SIL Safety Manual (Document ID: 66494)
- Further related documentation is available by entering the serial number of the device in the search field on "www.vega.com"

Editing status: 2023-11-27

1 Scope

These safety instructions apply to the radar sensors VEGAPULS 6X of type series:

- PS6X(*)a-b-c-de-f-g-hi-j-k-l-H/9/A-*R-p-q-r-s-t-u
- PS6X(*)a-b-c-de-f-g-hi-j-k-l-H/9/A-*J-p-q-r-s-t-u

With the electronics versions:

- H - Two-wire 4 ... 20 mA/HART
- 9 - Two-wire 4 ... 20 mA/HART with second current output 4 ... 20 mA
- A - Two-wire 4 ... 20 mA/HART with overvoltage arrester

The VEGAPULS 6X are approved acc. to UKEX:

CSAE 22UKEX1193X (certificate number on the type label)

Standards on which the certification is based:

- EN IEC 60079-0: 2018
- EN 60079-26: 2015
- EN 60079-31: 2014

Type of protection marking:

- Electronics H/9
 - II 1D Ex ta IIIC T* Da
 - II 1/2D Ex ta/tb IIIC T* Da/Db
 - IP66
- Electronics A
 - II 1/2D Ex ta/tb IIIC T* Da/Db
 - II 2D Ex tb IIIC T* Db
 - IP66

2 Type code specification

In the following, all versions are called VEGAPULS 6X. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

VEGAPULS 6X with type code PS6X(*)a-b-c-de-f-g-hi-j-k-l-m-no-p-q-r-s-t-u

a	Generation
2	Second generation

b	Application
*	One-digit code for preselection, not relevant for approval

c	Radar technology
W	80 GHz

de	Process fitting / Material
XX	universal, plastic horn antenna / PP/PBT
XC	Mounting strap, length: 170 mm / 316L/316L
XD	Mounting strap, length: 300 mm / 316L/316L
**	Other process fittings that comply with national or international standards

f	Antenna version
B	Plastic horn antenna
T	Thread with integrated antenna system
F	Flange with plastic plating
C	Flange with lens antenna
H	Hygienic fitting
G	with horn antenna (ø 19 mm)
K	with horn antenna (ø 25 mm)
L	with horn antenna (ø 40 mm)
N	with horn antenna (ø 48 mm)
D	with horn antenna (ø 75 mm)

g	Additional equipment
X	without
K	with rinsing air connection
V	with purging connection with reflux valve
1	Antenna system DD-lacquered
N	Device Norsok lacquered

hi	Material / Seal / Process temperature
AA	PEEK / FKM (SHS FPM 70C3 GLT) / -40 ... +150 °C
AB	PEEK / FKM (SHS FPM 70C3 GLT) / -40 ... +200 °C
AC	PEEK / FFKM (Kalrez 6230) / -15 ... +150 °C
AD	PEEK / FFKM (Kalrez 6230) / -15 ... +250 °C
AE	PEEK / FFKM (Kalrez 6375) / -20 ... +150 °C
AF	PEEK / FFKM (Kalrez 6375) / -20 ... +250 °C
AG	PEEK / FFKM (Perlast G75B) / -15 ... +150 °C
AH	PEEK / FFKM (Perlast G75B) / -15 ... +250 °C
AJ	PEEK / FFKM (Perlast G74S) / -15 ... +150 °C
AK	PEEK / FFKM (Perlast G74S) / -15 ... +250 °C
AL	PEEK / EPDM (COG AP302) / -40 ... +150 °C (for lens antennas)
AL	PEEK / EPDM (A+P 70.10-02) / -55 ... +150 °C (for threaded version)
AT	PP / PP / -40 ... +80 °C
AU	PP / FKM (SHS FPM 70C3 GLT) / -40 ... +80 °C
AV	PP / EPDM (COG AP310) / -40 ... +80 °C
AW	PTFE / PTFE / -60 ... +150 °C
A4	PTFE / PTFE / -60 ... +200 °C
AX	PTFE / PTFE / -196 ... +200 °C
AY	PTFE (8 mm) / PTFE / -60 ... +150 °C

hi	Material / Seal / Process temperature
A5	PTFE (8 mm) / PTFE / -60 ... +200 °C
AZ	PTFE (8 mm) / PTFE / -196 ... +200 °C
A2	PFA (8 mm) / PFA / -60 ... +150 °C
A3	PFA (8 mm) / PFA / -60 ... +200 °C
AM	PVDF / FKM / -40 ... +8 °C
AN	Ceramic / graphite / -196 ... +450 °C
AP	Ceramic / FKM (PPE V71C) / -40 ... +150 °C
AQ	Ceramic / FFKM (Kalrez 6375) / -20 ... +250 °C
AR	Ceramic / FFKM (Perlast G75B) / -15 ... +250 °C
AS	Ceramic / EPDM / -40 ... +150 °C
A8	PEEK / PEEK / -40 ... +150 °C
A6	PEEK / FKM (COG Vi780) / -40 ... +150 °C
A7	PEEK / EPDM (Freudenberg 291) / -20 ... +150 °C
A1	PTFE / FFKM (Kalrez 6230) / -15 ... +150 °C
A9	PTFE / EPDM (Freudenberg 291) / -20 ... +150 °C

j	Housing / Protection
A	Aluminium single chamber / IP66/IP68 (0.2 bar)
H	Special colour Aluminium single chamber / IP66/IP68 (0.2 bar)
D	Aluminium double chamber / IP66/IP68 (0.2 bar)
S	Special colour Aluminium double chamber / IP66/IP68 (0.2 bar)
V	Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar)
W	Stainless steel double chamber / IP66/IP68 (0.2 bar)



k	Cable entry / Connection
D	M20 x 1.5 / Blind plug
1	M20 x 1.5 / without
N	½ NPT / Blind plug
Q	½ NPT / without
*	Other certified connection or cable gland suitable for the application






l	Display, adjustment or radio module
X	without display, adjustment or radio module, standard lid
A	Display and adjustment module PLICSCOM
F	without display, adjustment or radio module, lid with inspection window
B	Display/adjustment module PLICSCOM, laterally mounted
K	Display/adjustment module PLICSCOM, with Bluetooth
L	Display/adjustment module PLICSCOM, laterally mounted; with Bluetooth

m	Electronics
H	Two-wire 4 ... 20 mA/HART
A	Two-wire 4 ... 20 mA/HART with overvoltage arrester
9	Two-wire 4 ... 20 mA/HART with second current output 4 ... 20 mA
no	Explosion protection
*R	Dust ignition protection by enclosure
*J	Flameproof enclosure + Dust ignition protection by enclosure
p	Functional safety SIL (IEC 61508)
X	without
*	with
q	IT Security (IEC 62443-4-2)
X	without
*	with
r	Overfill protection
X	without
*	with
s	Food/pharmaceutical certificate
X	without
*	with
t	Ship approval
X	without
*	with
u	Secondary Line of Defense
X	without
S	with

3 Application area

Overview of the different application areas:

VEGA Instrument	EPL Dc	EPL Db	EPL Da/Db	EPL Da
Ex Zone 22 				

VEGA Instrument	EPL Dc	EPL Db	EPL Da/Db	EPL Da
Ex Zone 21 				
Ex Zone 20 				

Application area of VEGAPULS 6X (electronics version H/9):

Type code	Explosion group	Type of protection marking
Electronics version "H/9" - Two-wire 4 ... 20 mA/HART		
PS6X(*).2*W*****H/9*R*****	IIIC	Ex ta, ta/tb IIIC T* Da, Da/Db IP66
PS6X(*).2*W*****H/9*J*****	IIA, IIB, IIC IIIA, IIIB, IIIC	Ex db IIC T6...T1 Ga/Gb, Gb Ex ta, ta/tb IIIC T* Da, Da/Db IP66

Application area of VEGAPULS 6X (electronics version A):

Type code	Explosion group	Type of protection marking
Electronics version "A" - Two-wire 4 ... 20 mA/HART with overvoltage arrester		
PS6X(*).2*W*****A*R*****	IIIC	Ex ta/tb, tb IIIC T* Da/Db, Db IP66
PS6X(*).2*W*****A*J*****	IIA, IIB, IIC IIIA, IIIB, IIIC	Ex db IIC T6...T1 Ga/Gb, Gb Ex ta/tb, tb IIIC T* Da/Db, Db IP66

VEGAPULS 6X without overvoltage arrester: PS6X(*).2*W*****H/9*****

The voltage resistance against ground is min. 500 V_{eff}.

VEGAPULS 6X with overvoltage arrester: PS6X(*).2*W*****A*****

The built-in overvoltage arrester type Bourns 2036-60 has the following characteristic values:

DC Sparkover = 600 V ± 20 % @ 100 V/s

Impulse Sparkover = 850 V @ 100 V/μs

Impulse Sparkover = 1100 V @ 1000 V/μs

Further characteristic data can be found in the data sheet of the Bourns 2036-60.

The voltage resistance against ground is min. 340 V_{eff}.

4 Specific conditions of use ("X" identification)

The following list describes the special operating conditions of VEGAPULS 6X.

- In the application the following applies to the radar sensors VEGAPULS 6X in the versions with Aluminium/Titanium:

- Installation must be carried out in such a way that the generation of sparks as a result of impact and friction processes between Aluminium/Titanium and steel is excluded. This excludes stainless steel without rust particles.
- Certain components of the radar sensor VEGAPULS 6X can charge electrostatically. These include: Plastic housings, non-grounded metal parts, plastic antennas. For details, refer to chapter "*Electrostatic charge (ESD)*" of these safety instructions.
- To avoid the risk of electrostatic charging of metal parts, the VEGAPULS 6X must be connected to the potential equalization (transition resistance $\leq 1 \text{ M}\Omega$).
- All parts of VEGAPULS 6X in contact with the medium must only be used in such a medium against which the materials are sufficiently resistant.
- VEGAPULS 6X with rinsing connection: It must be ensured that the IP67 degree of protection is provided at the connection to the reflux valve when used as EPL Da/Db instruments. After removing the reflux valve or the rinsing facility on the refölux valve, the opening must be closed with a suitable screw plug so that the IP67 degree of protection is maintained.
- VEGAPULS 6X with swivelling holder: It must be ensured that the IP67 degree of protection is maintained when operating as EPL Da/Db instrument after aligning the antenna using the swivelling holder and after screwing on the tension flange.
- Ambient temperature
 - You can find the details in chapter "*Thermal data*" of these safety instructions.

5 Installation

- The installation of the device must only be carried out by qualified personnel.
- The staff must be trained in explosion protection and familiar with the relevant valid regulations.
- Make sure when working on the instrument that there is no explosive atmosphere present. The supply circuits should be voltage-free, if possible.
- Install the instrument in accordance with the manufacturer specification and the applicable national regulations, e.g. planning and installation in accordance with IEC/EN 60079-14.
- The devices must be integrated into the local potential equalization.
- If grounding of the cable screening is necessary, this must be carried out acc. to the valid standards and regulations, e.g. acc. to IEC/EN 60079-14.
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label.

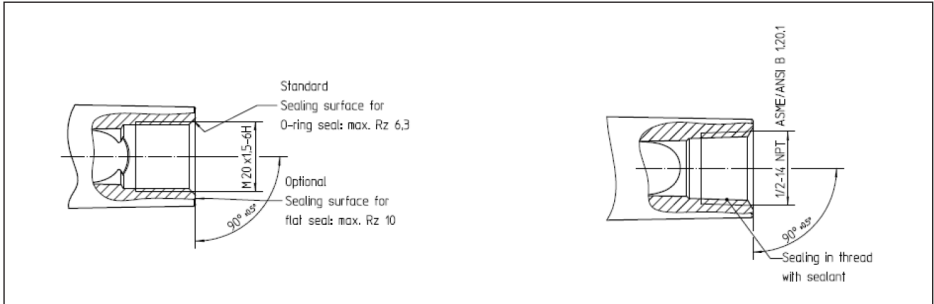
Cable glands, threaded openings

Type	Thread	Cable diameter [mm]	Torques [Nm]
Hummel EXIOS A2F 1.608.2003.50	M20 x 1.5	6 ... 12 mm	8
Hummel EXIOS A2F 1.608.1203.70	½ NPT	6 ... 12 mm	8
Hummel EXIOS MZ 1.6Z5.2000.51	M20 x 1.5	9 ... 13 mm	8
Hummel EXIOS MZ 1.6Z5.1200.70	½ NPT	9 ... 13 mm	8

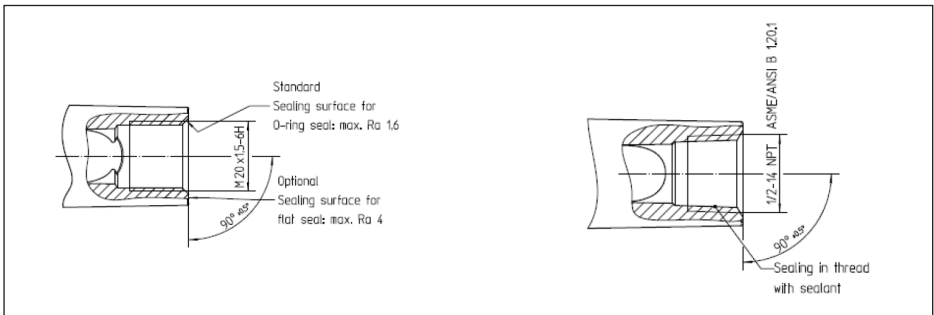
The specified torques are test torques and can only be regarded as reference values. The manufacturer's mounting instructions provided must be observed.

If suitable cable glands or cable insertion possibilities not included in the scope of supply are used, these must be compatible with the threaded openings.

Aluminium housing with M20 x 1.5 thread, 1/2 NPT thread



Stainless-steel housing (fine cast) with M20 x 1.5 thread, 1/2 NPT thread

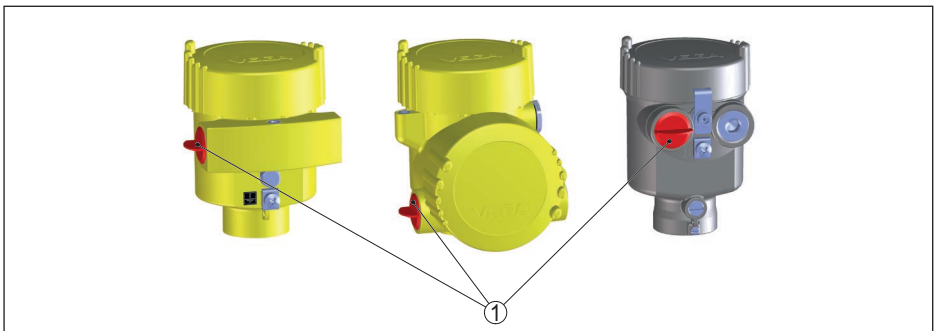


Maintenance

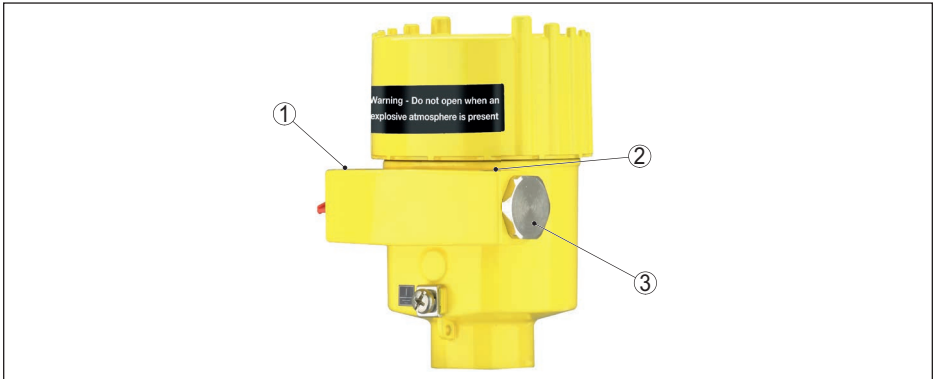
To ensure the functionality of the device, periodic visual inspection is recommended for:

- 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

The parts of the VEGAPULS 6X being in contact with flammable media during operation must be included in the periodic overpressure test of the plant.



1 Red threaded or dust protection cap



- 1 Label: Type and size of the thread ½-14 NPT or M20 x 1.5
- 2 Label: Type and size of the thread ½-14 NPT or M20 x 1.5
- 3 Screw plug

6 Operation

- Do not operate the device outside the electrical and thermal specifications given in this safety instruction
- Modifications on the instrument can influence the explosion protection and hence the safety
- Modifications must only be carried out by employees authorized by VEGA
- Note the relation between process temperature on the sensor/antenna and the permissible ambient temperature on the electronics housing. For permissible temperatures, see the respective temperature tables. See chapter "Thermal data".
- The information on mechanical wear in the operating instructions must be observed
- The continuous operating temperature of the connection cable must be suitable for the temperature range of the application
- Only original spare parts or spare parts approved for the purpose may be used for repairs
- The VEGAPULS 6X must be connected via suitable cable gland or conduit systems that are in conformity with the requirements of the standards and provided with a separate type approval certificate. When connecting the VEGAPULS 6X to conduit systems, the corresponding sealing facility must be connected directly to the housing. Keep the type and size of the threads in mind: The thread names are mentioned on the type label
- Unused openings must be covered according to the standards. 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.
- The connection cable of VEGAPULS 6X has to be wired fix and in such a way that damages can be excluded
- Lids must not be opened if there is a hazardous atmosphere. The housing lids are marked with the warning label:

WARNING - DO NOT OPEN WHEN AN
EXPLOSIVE ATMOSPHERE IS PRESENT

7 Electrostatic charging (ESD)

In case of instrument versions with electrostatically chargeable plastic parts, the danger of electro-

static charging and discharging must be taken into account!

The following parts can charge and discharge:

- Lacquered housing version or alternative special lacquering
- Plastic housing, plastic housing parts
- Plastic process fittings
- Plastic-coated process fittings and/or plastic-coated sensors
- Connection cable for separate versions
- Type label

Take note in case of danger of electrostatic charges:

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

The instruments must be 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:

WARNING - POTENTIAL ELECTROSTATIC
CHARGING HAZARD - SEE INSTRUCTIONS

8 Electrical data

For the VEGAPULS 6X in ignition protection type dust ignition protection by enclosure (IIIC) applies:

Electronics H/A

Supply and signal circuit: Terminals 1[+], 2[-]	Supply via a circuit with limited power (max. 100 W, see operating instructions), e.g. a class 2 power supply unit common in North America U = 12 ... 35 V DC
--	--

Display and adjustment circuit

Terminals 5, 6, 7, 8	For connection to the circuit of the associated external indicating unit VEGADIS 81.
Indication and adjustment circuit: (spring contacts)	For connection to the display and adjustment module PLICSCOM.

Electronics 9

Power supply and signal circuit 1: terminals 1[+], 2[-]	U = 12 ... 35 V DC P _{max} < 2 W
Power supply and signal circuit 2: terminals 7[+], 8[-] Terminal 1, 2, 7, 8 in connection compartment of the double chamber housing	U = 12 ... 35 V DC P _{max} < 2 W

The max. power of the voltage supply of VEGAPULS PS6X(*).2*W*****9*R/J***** installed in Zone 20 must not exceed 2 x 2 W.

9 Thermal data

9.1 Thermal data - General regulations

The approval is valid under the following conditions:

- Compliance with the temperature ranges for the various versions as indicated in the tables below.
- Pressure: 80 kPa (0.8 bar) to 110 kPa (1.1 bar), and
- Air with an oxygen content of 21 % (v/v)

Additional measures are required for operation of the VEGAPULS 6X outside these conditions.

The operation of the VEGAPULS 6X outside the above conditions is the sole responsibility of the operator.

The thermal measurements for determining the following temperature tables were carried out for process temperatures above +150 °C with insulation. Thermal measurements up to +150 °C were carried out without insulation.

Data sheets of the insulation used:

		SiBa 20/150a/ALU50	SiBa/-a
Data sheet extract insulation		Aluminium foil embossed Basalt/silica compound fleece	Basalt/silica compound fleece
General technical data		SiBa 20/150a/ALU50 is a mechanically bonded needlefelt based on a mixture of endless drawn basalt fibres and silica fibres, laminated with an aluminium foil (thickness approx. 50 µm).	It is a mechanically bonded needlefelt based on a mixture of continuously drawn basalt fibres (approx. 70 %) and silica fibres (approx. 30 %).
Thickness	[mm]	approx. 20	approx. 20
Grammage	[kg/m ²]	approx. 3	approx. 3
Bulk density	[kg/m ³]	approx. 150	approx. 150
Heat resistance in the long term	[°C]	up to 700 Radiant heat on aluminium max. 250	up to 700
Heat resistance in the short term	[°C]	up to 700	up to 700
Cold resistance	[°C]	up to -40	up to -40
Heat conductivity	[W/mK]	0.05 (at 200 °C) 0.15 (at 600 °C)	0.05 (at 200 °C) 0.15 (at 600 °C)
Vibration behaviour		Resistant	Resistant
Physiological behaviour		Harmless	Harmless
Toxicological behaviour		Not dangerous	Not dangerous
Filament diameter	[µm]	> 6	> 6
Flammability		Fire-proof	Fire-proof

For measurements with insulation, a layer thickness of 8 cm SiBa 20/150a was applied. Looking from the surface of the tank, a 6 cm layer of SiBa 20/150a was first applied. A 2 cm layer of SiBa 20/150a/ALU50 was then finally applied on top of this layer.

9.2 Thermal data - Dust

Max. surface temperature T_{sur} of VEGAPULS 6X when used in explosive atmospheres:

EPL Da instrument - Complete device (antenna and housing) installed in Zone 20 (surrounded by 200 mm dust):

Max. permissible ambient/process temperature:	+65 °C
Surface temperature:	Ambient/Process temperature +35 K
Max. surface temperature:	= 65 °C + 35 K = 100 °C

EPL Db instrument - Complete device (antenna and housing) installed in Zone 21 (without dust layer):

Max. permissible ambient/process temperature:	+65 °C
Surface temperature:	Ambient/Process temperature +35 K
Max. surface temperature:	= 65 °C + 35 K = +100 °C

EPL Da/Db instrument - Housing installed in Zone 21 without dust layer, antenna installed in Zone 20:

VEGAPULS 6X with plastic horn antenna

PS6X(*) .2*WB*AT/AU/AV*******

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-40 ... +76 °C	-40 ... +65 °C	Ambient temperature +35 K	+100 °C
Stainless steel V, W	-40 ... +76 °C	-40 ... +65 °C	Ambient temperature +35 K	+100 °C

VEGAPULS 6X with G1½, 1½ NPT, PVDF antenna

PS6X(*) .2*WT*AM*******

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-40 ... +76 °C	-40 ... +65 °C	Ambient temperature +35 K	+100 °C
Stainless steel V, W	-40 ... +76 °C	-40 ... +65 °C	Ambient temperature +35 K	+100 °C

VEGAPULS 6X with flange with plastic plating or with integrated antenna system (threaded connection) for process temperatures up to max. +150 °C

PS6X(*) .2*WF*AW/AY/A2*******

PS6X(*) .2*WT*AA/AC/AE/AG/AJ/AL*******

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +47 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +57 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +48 °C	Ambient temperature +35 K	+152 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +45 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +47 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +34 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AA** PEEK / FKM (SHS FPM 70C3-GLT) / **-40 ... +150 °C**
- **AC** PEEK / FFKM (Kalrez 6230) / **-15 ... +150 °C**
- **AE** PEEK / FFKM (Kalrez 6375) / **-20 ... +150 °C**
- **AG** PEEK / FFKM (Perlast G75B) / **-15 ... +150 °C**
- **AJ** PEEK / FFKM (Perlast G74S) / **-15 ... +150 °C**
- **AL** PEEK / EPDM (A+P 70.10-02) / **-55 ... +150 °C**
- **AW** PTFE / PTFE / **-60 ... +150 °C**
- **AY** PTFE (8 mm) / PTFE / **-60 ... +150 °C**
- **A2** PFA (8 mm) / PFA / **-60 ... +150 °C**

VEGAPULS 6X with flange with plastic plating or with integrated antenna system (threaded connection) or with lens antenna for process temperatures up to max. +195 °C

PS6X(*).2*W**F*AX/AZ/A3/A4/A5*****

PS6X(*).2*W**T*AB*****

PS6X(*).2*W**C*AB*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +56 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +72 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +62 °C	Ambient temperature +35 K	+197 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +55 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +66 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +49 °C	Ambient temperature +35 K	+197 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AB** PEEK / FKM (SHS FPM 70C3-GLT) / -40 ... +200 °C
- **A4** PTFE / PTFE / -60 ... +200 °C
- **A5** PTFE (8 mm) / PTFE / -60 ... +200 °C
- **A3** PFA (8 mm) / PFA / -60 ... +200 °C

VEGAPULS 6X with lens antenna for process temperatures up to max. +150 °C

PS6X(*).2*W**C*AA/AC/AE/AG/AJ/AL*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +51 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +65 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +58 °C	Ambient temperature +35 K	+152 °C

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Stainless steel V, W	-xx ... +95 °C	-40 ... +50 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +57 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +48 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AA** PEEK / FKM (SHS FPM 70C3-GLT) / **-40 ... +150 °C**
- **AC** PEEK / FFKM (Kalrez 6230) / **-15 ... +150 °C**
- **AE** PEEK / FFKM (Kalrez 6375) / **-20 ... +150 °C**
- **AG** PEEK / FFKM (Perlast G75B) / **-15 ... +150 °C**
- **AJ** PEEK / FFKM (Perlast G74S) / **-15 ... +150 °C**
- **AL** PEEK / EPDM (A+P 70.10-02) / **-40 ... +150 °C**

VEGAPULS 6X with integrated antenna system (threaded connection) or with lens antenna for process temperatures up to max. +250 °C

PS6X(*).2*WC*AD/AF/AH/AK*******

PS6X(*).2*WT*AD/AF/AH/AK*******

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +54 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +69 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +63 °C	Ambient temperature +35 K	+197 °C
	-xx ... +250 °C	-40 ... +55 °C	Ambient temperature +35 K	+252 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +53 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +65 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +56 °C	Ambient temperature +35 K	+197 °C
	-xx ... +250 °C	-40 ... +45 °C	Ambient temperature +35 K	+252 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AD** PEEK / FFKM (Kalrez 6230) / **-15 ... +250 °C**

- **AF** PEEK / FFKM (Kalrez 6375) / -20 ... +250 °C
- **AH** PEEK / FFKM (Perlast G75B) / -15 ... +250 °C
- **AK** PEEK / FFKM (Perlast G74S) / -15 ... +250 °C

VEGAPULS 6X flange with horn antenna for process temperatures up to max. +150 °C

PS6X(*).2*W**G/K/L/N/D*AP/AS*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +46 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +60 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +52 °C	Ambient temperature +35 K	+152 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +46 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +50 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +38 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AP** Ceramic / FKM (PPE V71C) / -40 ... +150 °C
- **AS** Ceramic / EPDM / -40 ... +150 °C

VEGAPULS 6X with hygiene for process temperatures up to max. +150 °C

PS6X(*).2*WXM/XN/XOT*AC/AJ/A6/A7*****

PS6X(*).2*W**H*AC/AJ/A6/A7*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +49 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +63 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +56 °C	Ambient temperature +35 K	+152 °C

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Stainless steel V, W	-xx ... +95 °C	-40 ... +47 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +57 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +48 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AC** PEEK / FFKM (Kalrez 6230) / -15 ... +150 °C
- **AJ** PEEK / FFKM (Perlast G74S) / -15 ... +150 °C
- **A6** PEEK / FKM (PPE V70SW) / -10 ... +150 °C
- **A7** PEEK / EPDM (Freudenberg 291) / -20 ... +150 °C

VEGAPULS 6X with hygiene LA, LB for process temperatures up to max. +150 °C

PS6X(*).2*WLAH*A1/A9*****

PS6X(*).2*WLBH*A1/A9*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +47 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +57 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +48 °C	Ambient temperature +35 K	+152 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +46 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +48 °C	Ambient temperature +35 K	+132 °C
	-xx ... +150 °C	-40 ... +35 °C	Ambient temperature +35 K	+152 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **A1** PTFE / FFKM (Kalrez 6230) / -15 ... +150 °C
- **A9** PTFE / EPDM (Freudenberg 291) / -20 ... +150 °C

VEGAPULS 6X flange with horn antenna for process temperatures up to max. +250 °C

PS6X(*)2*W**G/K/L/N/D*AQ/AR*****

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-xx ... +95 °C	-40 ... +51 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +65 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +59 °C	Ambient temperature +35 K	+197 °C
	-xx ... +250 °C	-40 ... +50 °C	Ambient temperature +35 K	+252 °C
Stainless steel V, W	-xx ... +95 °C	-40 ... +49 °C	Ambient temperature +35 K	+97 °C
	-xx ... +130 °C	-40 ... +59 °C	Ambient temperature +35 K	+132 °C
	-xx ... +195 °C	-40 ... +56 °C	Ambient temperature +35 K	+197 °C
	-xx ... +250 °C	-40 ... +47 °C	Ambient temperature +35 K	+252 °C

xx °C lower temperature in the process, limited by the sealing type with xx:

- **AQ** Ceramic / FFKM (Kalrez 6375) / **-20** ... +250 °C
- **AR** Ceramic / FFKM (Perlast G75B) / **-15** ... +250 °C

VEGAPULS 6X flange with horn antenna for process temperatures up to max. +440 °C

PS6X(*)2*W**L/N/D*AN*****

Important note on the use of the following tables:

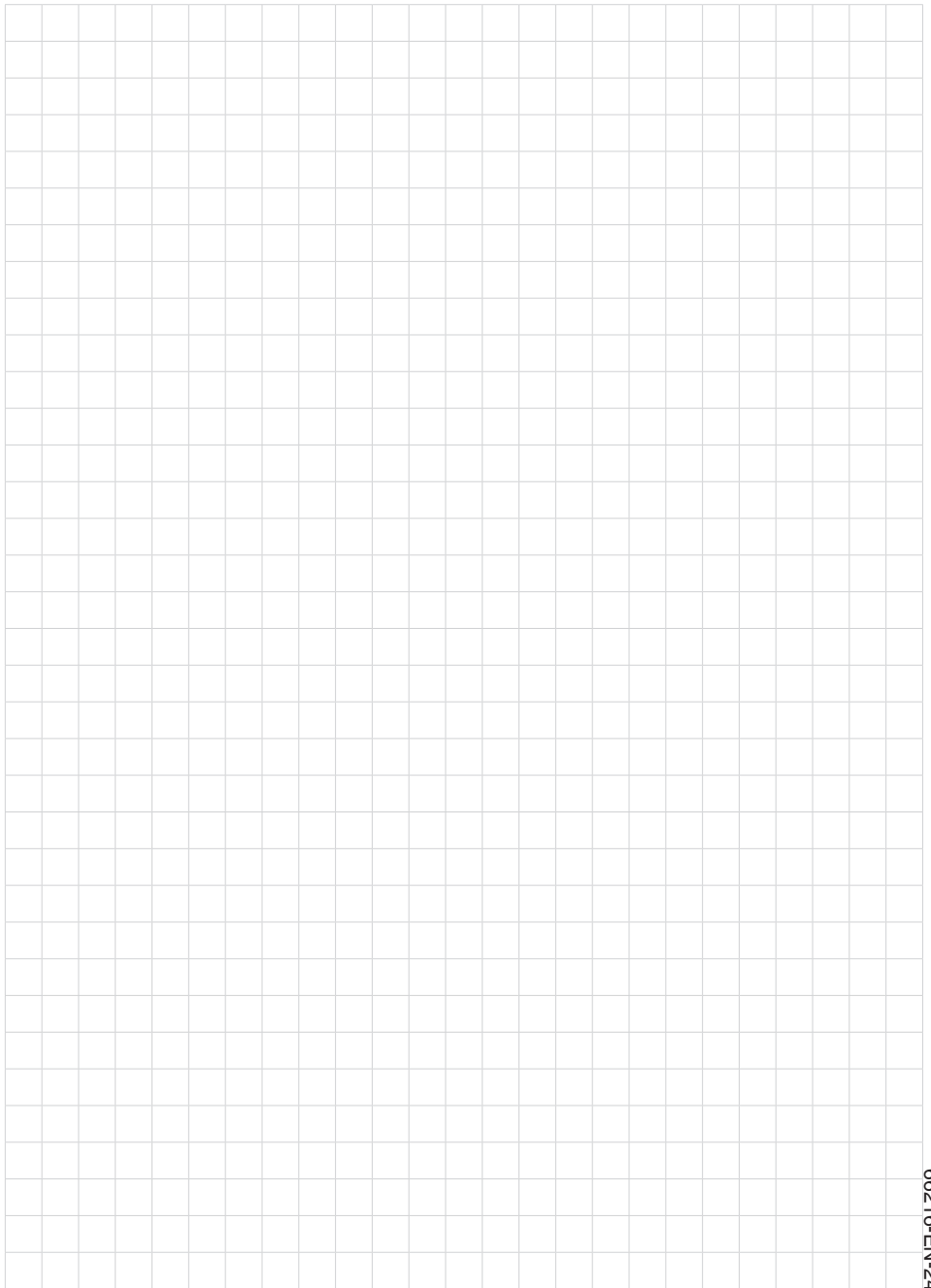
With a minimum process temperature of -196 °C, a minimum ambient temperature of -10 °C is still permissible.

With a minimum process temperature of -60 °C, a minimum ambient temperature of -35 °C is still permissible.

With a minimum process temperature of -40 °C, a minimum ambient temperature of -40 °C is still permissible.

Housing (electronics)	Permissible process temperature range on the antenna in zone 20	Permissible ambient temperature range in Zone 21 on the electronics housing	Surface temperature of the electronics housing	Max. surface temperature
Aluminium A, D, H, S	-196 / -60 / -40 ... +95 °C	-10 / -35 / -40 ... +54 °C	Ambient temperature +35 K	+97 °C
	-196 / -60 / -40 ... +130 °C	-10 / -35 / -40 ... +72 °C	Ambient temperature +35 K	+132 °C
	-196 / -60 / -40 ... +195 °C	-10 / -35 / -40 ... +73 °C	Ambient temperature +35 K	+197 °C
	-196 / -60 / -40 ... +290 °C	-10 / -35 / -40 ... +69 °C	Ambient temperature +35 K	+292 °C
	-196 / -60 / -40 ... +440 °C	-10 / -35 / -40 ... +56 °C	Ambient temperature +35 K	+442 °C
Stainless steel V, W	-196 / -60 / -40 ... +95 °C	-10 / -35 / -40 ... +52 °C	Ambient temperature +35 K	+97 °C
	-196 / -60 / -40 ... +130 °C	-10 / -35 / -40 ... +68 °C	Ambient temperature +35 K	+132 °C
	-196 / -60 / -40 ... +195 °C	-10 / -35 / -40 ... +71 °C	Ambient temperature +35 K	+197 °C
	-196 / -60 / -40 ... +290 °C	-10 / -35 / -40 ... +66 °C	Ambient temperature +35 K	+292 °C
	-196 / -60 / -40 ... +440 °C	-10 / -35 / -40 ... +51 °C	Ambient temperature +35 K	+442 °C







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