

Safety instructions

VEGAPULS 62, 63,66, 67, 68, SR68

Dust ignition protection by enclosure

HW \geq 2.0.0, SW \geq 4.0.0

IECEX BVS 05.0008 X

4 ... 20 mA/HART - two-wire

4 ... 20 mA/HART - four-wire

Profibus PA

Foundation Fieldbus



Document ID: 49673



VEGA

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Supplementary documentation:

- Operating Instructions VEGAPULS 62, 63, 66, 67, 68, SR68
- Certificate of Conformity IECEx BVS 05.0008 X, Issue 6 (Document ID: 55993)

1 Area of applicability

These safety instructions apply to the radar sensors VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, according to the Certificate of Conformity IECEx BVS 05.0008 X, Issue 6 (certificate number on the type label) and to all instruments with the number of the safety instruction (49673) on the type label.

2 General information

The level measuring instrument VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, is based on radar technology and is used to detect the distance between product surface and sensor (the antenna) 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 PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, consist of a metal housing, a process connection element and a sensor (the antenna). As an option the display and adjustment module can also be integrated.

The VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, are used for monitoring or control also in areas with combustible, dust-generating bulk solids requiring instruments of category EPL Da, EPL Da/Db or EPL Db.

If the VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, are installed and operated in hazardous areas, the general Ex installation regulations IEC 60079-14 as well as these safety instructions must be observed.

The operating instructions as well as the installation regulations or standards that apply for explosion protection of electrical systems must generally be observed.

The installation of explosion-endangered systems must always be carried out by qualified personnel.

The requirements of IEC 60079-14 (2008) e.g. with respect to dust and temperatures must be fulfilled.

EPL Da instrument

The electronics housing and the antennas with the mechanical fixing element are installed in explosion-endangered areas, in areas requiring EPL Da instruments.

EPL Da/Db or EPL Da/Dc instrument

The electronics housing is installed in hazardous areas requiring instruments of EPL Da/Db or EPL Da/Dc. The process connection element is installed in the separating wall, which separates areas requiring instruments of EPL Db, EPL Dc or EPL Da. The antenna system with the mechanical fixing element is installed in hazardous areas requiring instruments of EPL Da.

EPL Db instrument

The electronics housing and the antenna system with the mechanical fixing element are installed in explosion-endangered areas, in areas requiring instruments of EPL Db.

3 Technical data

Electrical data

VEGAPULS PS62/63.DK*D/H***, VEGAPULS PS66/68.DK***H***, VEGAPULS PSSR68.DK***H*****

Operating voltage: (terminals 1[+], 2[-] in "Ex-d" connection compartment) $U = 14 \dots 36 \text{ V DC}$
 $U_m = 253 \text{ V AC}$

VEGAPULS PS62/63.DK*K/L/P/F***, VEGAPULS PS66/68.DK***P/F***, VEGAPULS PSSR68.DK***P/F*****

Power supply and signal circuit: (terminal 1, 2 in the "Ex-d" connection compartment) $U = 16 \dots 32 \text{ V DC}$
 $U_m = 253 \text{ V AC}$

VEGAPULS PS62/63.RX*D/H/K/L/P/F***, VEGAPULS PS66/67/68.RX***H/P/F***, VEGAPULS PSSR68.RX***H/P/F*****

Operating voltage: (terminals 1[+], 2[-] in the electronics compartment, with double chamber housing version in the connection compartment) $U = 9.7 \dots 30 \text{ V DC}$
 $U_{\text{max.}} = 30 \text{ V DC}$

VEGAPULS PS62/63.RX/DK*G/M/B/I***, VEGAPULS PS66/68.RX/DK***B/I***, VEGAPULS PS67.RX**G/M/B/I***, VEGAPULS PSSR68.DK**B/I*****

Voltage supply: (terminals 1, 2 in the connection compartment) $U = 90 \dots 253 \text{ V AC}$ or $U = 9.6 \dots 48 \text{ V DC}$ or $U = 20 \dots 42 \text{ V AC}$

$$U_m = 253 \text{ V AC}$$

Active signal current output: (KI5[+], KI7[-] in the connection compartment) $I_{\text{out}} 4 \dots 20 \text{ mA}$ with superimposed HART signal
 $U_m = 60 \text{ V AC}$

Passive signal current output: (KI6[+], KI7[-] in the connection compartment) $I_{\text{out}} 4 \dots 20 \text{ mA}$ with superimposed HART signal
 $U_m = 60 \text{ V AC}$

VEGAPULS PS62/63.CK*D/H***, VEGAPULS PS66/68.CK***H***, VEGAPULS PSSR68.CK***I*****

Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment; with double chamber housing version in connection compartment) Ignition protection type intrinsic safety Ex ia IIC
 For connection to a certified, intrinsically safe circuit.
 Maximum values:

- $U_i = 30 \text{ V}$
- $I_i = 131 \text{ mA}$
- $P_i = 983 \text{ mW}$

The effective internal capacitance C_i is negligible.

The effective internal inductance is $L_i \leq 5 \mu\text{H}$.

The intrinsically safe circuit is electrically isolated from parts which can be grounded. The metallic parts of VEGAPULS PS6*.CK***D/H***, VEGAPULS PSSR68.CK***D/H*** are electrically connected with the internal and external earth terminal.

VEGAPULS PS62/63.CK***K/L/P/F***, VEGAPULS PS66/68.CK***P/F***, VEGAPULS PSSR68.CK***P/F***

Power supply and signal circuit: (terminals 1[+], 2[-] in electronics compartment; with double chamber housing version in connection compartment)

Ignition protection type intrinsic safety Ex ia IIC/IIB or Ex ib IIC/IIB

For connection to a certified, intrinsically safe circuit.

Maximum values:

- $U_i = 17.5 \text{ V}$
- $I_i = 500 \text{ mA}$
- $P_i = 5.5 \text{ W}$

The instrument is suitable for connection to a Fieldbus system according to the FISCO model (IEC 60079-27), e.g. Profibus PA or Foundation Fieldbus.

or

- $U_i = 24 \text{ V}$
- $I_i = 250 \text{ mA}$
- $P_i = 1.2 \text{ W}$

The effective internal capacitance C_i is negligible.

The effective internal inductance is $L_i \leq 5 \mu\text{H}$.

The intrinsically safe circuit is electrically isolated from parts which can be grounded. The metallic parts of VEGAPULS PS6*.CK***K/L/P/F***, VEGAPULS PSSR68.CK***K/L/P/F*** are electrically connected with the internal and external earth terminal.

VEGAPULS PS62/63.RX/CK/DK***D/H/K/L/P/F***, VEGAPULS PS66/68.RX/CK/DK***H/P/F***, VEGAPULS PSSR68.RX/CK/DK***H/P/F***, VEGAPULS PS67.RX**H/P/F***

Display and adjustment circuit: (terminals 5, 6, 7, 8 in electronics compartment)

Ignition protection type intrinsic safety Ex ia IIC

Only for connection to an intrinsically safe circuit of the appropriate external display and adjustment unit VEGADIS 61 (BVS 05 ATEX E 023, PTB 02 ATEX 2136 X).

The rules for the interconnection of intrinsically safe circuits between VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, and the external display and adjustment unit VEGADIS 61 are fulfilled, provided that the total inductance and total capacitance of the connection cable between VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, and the external display unit VEGADIS 61 $L_{\text{cable}} = 310 \mu\text{H}$ and $C_{\text{cable}} = 2 \mu\text{F}$ are not exceeded.

A display and adjustment module mounted in VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, is taken into account.

Display and adjustment module circuit: (spring contacts in the electronics compartment, additionally in the connection compartment with double chamber housing version)

Ignition protection type intrinsic safety Ex ia IIC
For connection to the display and adjustment module or VEGACONNECT.

With the double chamber housing version, the display and adjustment module may be mounted either in the electronics compartment or in the connection compartment.

The intrinsically safe circuits of VEGAPULS PS6*/PSSR68.DK(*)***** are grounded.

The circuits of VEGAPULS PS6*/PSSR68.RX/DK/CK(*)***** are electrically isolated from parts which can be grounded. The metallic parts of VEGAPULS PS6*/PSSR68.RX/DK/CK(*)***** are electrically connected with the internal and external earth terminal.

VEGAPULS PS62/63.RX/DK*G/M/B/I**, VEGAPULS PS66/68.RX/DK***B/I**, VEGAPULS PSSR68.RX/DK***B/I**, VEGAPULS PS67.RX**G/M/B/I****

Display and adjustment module circuit: (spring contacts in the electronics compartment, additionally in the connection compartment with double chamber housing version)

Ignition protection type intrinsic safety Ex ia IIC
Only for connection to the display and adjustment module PLICSCOM or VEGACONNECT (PTB 07 ATEX 2013 X).

The intrinsically safe circuits of VEGAPULS PS6*/PSSR68.DK(*)***** are grounded.

The circuits of VEGAPULS PS6*/PSSR68.RX(*)***** are electrically isolated from parts which can be grounded. The metallic parts of VEGAPULS PS6*/PSSR68.RX(*)***** are electrically connected with the internal and external earth terminal.

4 Application conditions

Permissible ambient temperatures

On the sensor (antenna), EPL Da or EPL Db			
VEGAPULS PS62(*)..*****X****	X:	2	FKM (SHS FPM 70C3 GLT) and PTFE / -40 ... +130 °C
		3	FFKM (Kalrez 6375) and PTFE / -20 ... +130 °C
		6	FFKM (Kalrez 2035) and PTFE / -15 ... +130 °C
		7	FFKM (Kalrez 6230) and PTFE / -15 ... +130 °C
		A	FKM (SHS FPM 70C3 GLT) and PEEK / -15 ... +200 °C
		C	FFKM (Kalrez 2035) and PEEK / -15 ... +210 °C
		E	FFKM (Kalrez 6230) and PEEK / -15 ... +250 °C
		F	FFKM (Kalrez 6375) and PEEK / -20 ... +250 °C
		H	Graphite and ceramic / -196 ... +450 °C

On the sensor (antenna), EPL Da or EPL Db			
VEGAPULS PS63(*)**X****	X:	N	Aseptically encapsulated horn antenna / TFM-PTFE / -40 ... +200 °C
		J	Aseptically encapsulated horn antenna / TFM-PTFE / -196 ... +200 °C
		R	Aseptically encapsulated horn antenna / PTFE (8 mm) / -40 ... +200 °C
		L	Aseptically encapsulated horn antenna / PFA / -40 ... +200 °C
		M	Aseptically encapsulated horn antenna / PFA (8 mm) / -40 ... +200 °C
		V	aseptically encapsulated horn antenna / TFM-PTFE + FKM / -20 ... +130 °C
		E	aseptically encapsulated horn antenna / TFM-PTFE + EPDM / -40 ... +130 °C
		U	aseptically encapsulated horn antenna / PTFE (8 mm) / -196 ... +200 °C
		*	several suitable horn antennas
VEGAPULS PS66(*)*****X****	X:	2	FKM (A+P GLT FPM 70.16-06) / -40 ... +150 °C
		3	FFKM (Kalrez 6375) / -20 ... +150 °C
		5	EPDM (A+P 75.5/KW75F) / -40 ... +150 °C
		G	Graphite and ceramic / -60 ... +250 °C with temperature adapter
		H	Graphite and ceramic / -60 ... +400 °C with temperature adapter
VEGAPULS PS67(*)**X*****	X:	B	PP / -40 ... +80 °C
		*	several suitable versions
VEGAPULS PS68(*)*****X****	X:	2	FKM (SHS FPM 70C3 GLT) and PTFE / -40 ... +130 °C
		3	FFKM (Kalrez 6375) and PTFE / -20 ... +130 °C
		7	FFKM (Kalrez 6230) and PTFE (FDA) / -15 ... +130 °C
		A	FKM (SHS FPM 70C3 GLT) and PEEK / -15 ... +200 °C
		C	FFKM (Kalrez 2035) and PEEK / -15 ... +210 °C
		E	FFKM (Kalrez 6230) and PEEK / -15 ... +250 °C
		F	FFKM (Kalrez 6375) and PEEK / -20 ... +250 °C
		H	Graphite and ceramic / -196 ... +450 °C

On the electronics housing, EPL Db	
VEGAPULS PS6* .***** VEGAPULS PSSR68.*****	-40 ... +60 °C

Max. surface temperature

On the sensor (antenna), EPL Da or EPL Db	
VEGAPULS PS6* .***** VEGAPULS PSSR68.*****	Process temperature +2 K

On the electronics housing, EPL Da, EPL Db, EPL Dc	Zone 20	Zone 21/22
VEGAPULS PS62/63(*) .RX****H/ D****	Ambient temperature +86 K	Ambient temperature +36 K
VEGAPULS PS62/63(*) .RX****P/ K/F/L****	Ambient temperature +22 K	Ambient temperature +22 K

On the electronics housing, EPL Da, EPL Db, EPL Dc	Zone 20	Zone 21/22
VEGAPULS PS62/63(*).CK****H/D****	Ambient temperature +43 K	Ambient temperature +43 K
VEGAPULS PS62/63(*).CK****P/K/F/L****	Ambient temperature +22 K	Ambient temperature +22 K
VEGAPULS PS66(*).RX****H****	Ambient temperature +86 K	Ambient temperature +36 K
VEGAPULS PS66(*).RX****P/F****	Ambient temperature +22 K	Ambient temperature +22 K
VEGAPULS PS66(*).CK****H****	Ambient temperature +86 K	Ambient temperature +36 K
VEGAPULS PS66(*).CK****P/F****	Ambient temperature +22 K	Ambient temperature +22 K
VEGAPULS PS67(*).RX****H****	Ambient temperature +86 K	Ambient temperature +36 K
VEGAPULS PS67(*).RX****P/F****	Ambient temperature +22 K	Ambient temperature +22 K
VEGAPULS PS68/SR68(*).RX****H****	Ambient temperature +86 K	Ambient temperature +36 K
VEGAPULS PS68/SR68(*).RX****P/F****	Ambient temperature +22 K	Ambient temperature +22 K
VEGAPULS PS62/63(*).RX****G/M****	Limited to +102 °C by the thermal link	
VEGAPULS PS62/63/66(*).RX****B/I****		
VEGAPULS PS62/63(*).DK****G/M****		
VEGAPULS PS62/63/66(*).DK****B/I****		
VEGAPULS PS67(*).RX****B/I****		
VEGAPULS PS68/SR68(*).RX****B/I****		
VEGAPULS PS68/SR68(*).DK****B/I****		

The max. surface temperature of the instrument with which the hazardous dust atmosphere can come into contact, **is the higher** of the two specified surface temperatures on the electronics housing or the sensor/antenna.

Protection rating

Housing protection classification, EPL Da or EPL Db: IP 66

Sensor (antenna), EPL Da or EPL Db: IP 68

5 Installation/construction

The VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX***** must be mounted in such a way that the antenna or tube extensions cannot bend or touch the vessel wall due to the influence of vessel installations and moving bulk solids. This applies especially to lengths over 3 m.

6 Material resistance

The VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX***** must only be used in media against which the materials of the wetted parts are sufficiently resistant.

7 Grounding

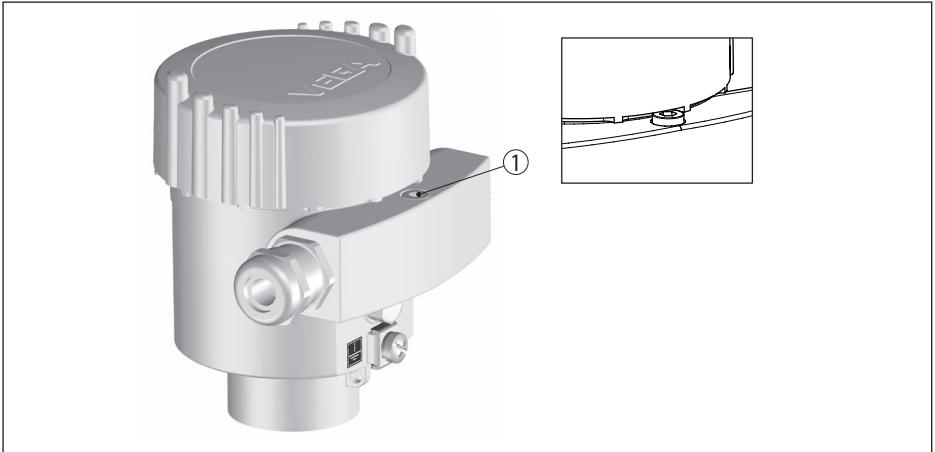
The VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, must be grounded.

8 Locking mechanism of housing cover

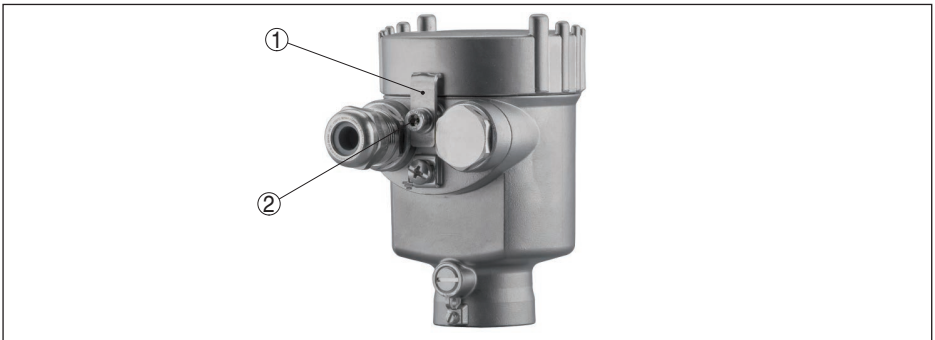
With single-chamber housing versions of VEGAPULS PS6*.CK/RX*****, VEGAPULS PSSR68.CK/RX*****, the lid must be screwed in to the stop and secured with the locking device **before** setup and use in hazardous atmospheres.

With double-chamber housing versions, the lid of the connection compartment and the lid of the electronics compartment must be screwed in to the stop and secured with the corresponding locking device **before** setup and use of VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX*****, in hazardous atmospheres.

Single chamber housing



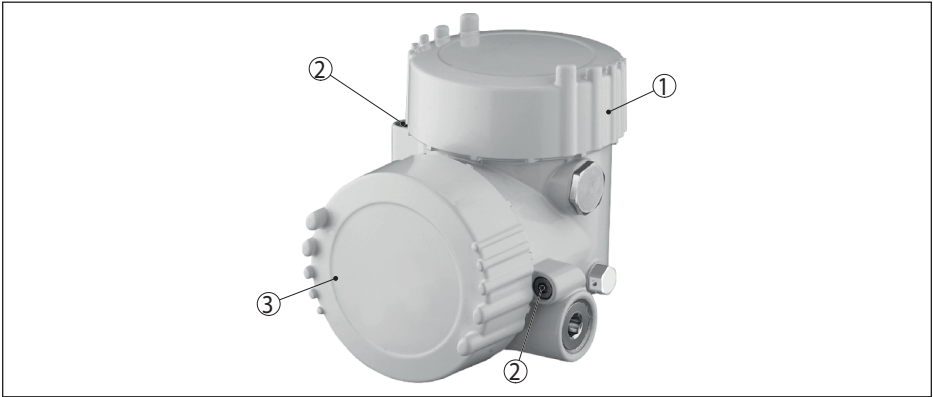
1 Locking screw of the lid



1 Bracket

2 Locking screw of the lid

Double chamber housing with "Ex-d" connection compartment



- 1 "Ex-i" connection compartment with electronics module
- 2 Locking screw of the lid
- 3 "Ex d" connection compartment with integrated barrier

9 Type and size of the threads for the cable entries

The VEGAPULS PS6*(*) .CK/DK/RX**...***M*** are designed with an M20 x 1.5 thread for the cable entries, sealing screw(s) or plug connection(s).

The VEGAPULS PS6*(*) .CK/DK/RX**...***N*** are designed with a 1/2-14 NPT thread for the cable entries, sealing screw(s), plug connection(s) or conduit system.

In the version with the two-chamber housing, the electronics housing in the VEGAPULS PS6*(*) .CK**...***M*** version additionally has an M16 x 1.5 thread and in the VEGAPULS PS6*(*) .CK**...***N*** version a 3/8-18 NPT thread for installation of a cable entry, sealing screw or plug connection.

Depending on the selected feature in the selection "cable entry/connection" in the type key of the VEGAPULS PS6*(*) .CK/DK/RX**...*_* ("_" = position selection feature) the housing openings in the as-delivered state are sealed by a suitable cable gland, sealing plug, plug connection or red threaded/dust protection cap accordingly. The feature "1/Q" resp. "M/N" in the type key is then replaced by the appropriate feature of the connection possibility.

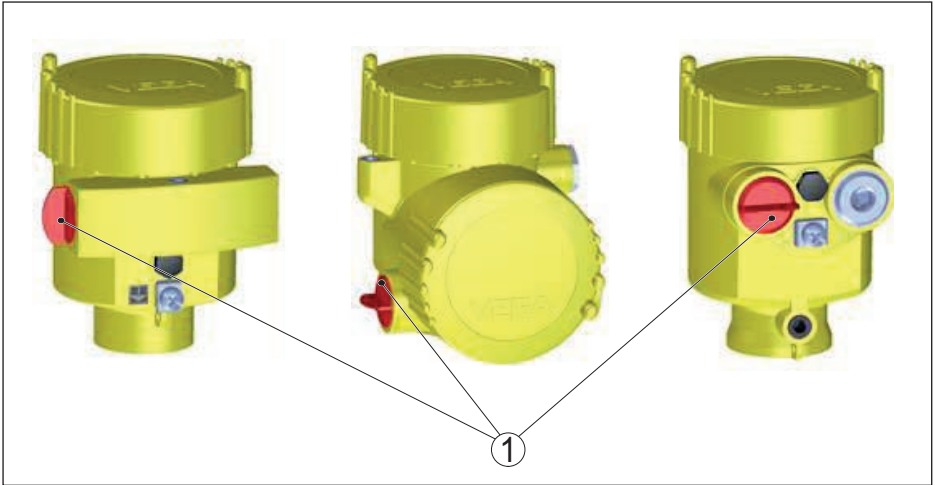
There is an information plate bearing the thread designation on the housing next to all threads.

10 Removing and replacing the red threaded/dust cover

When the VEGAPULS PS6* .CK/DK/RX***** , VEGAPULS PSSR68.CK/DK/RX***** are delivered, depending on the version, the red threaded or dust protection caps must be removed before installing the device and the openings must be sealed according to the requirements of the type of protection and the IP protection type specified on the type label.

When using certified i.e. suitable cable glands, sealing plugs or plug connectors, they must be mounted correctly and the respective certificates/documents must be observed.

The sealing plugs included in the delivery by VEGA meet the necessary requirements.



1 Red threaded or dust protection cap

11 Installation with swivelling holder

The VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX***** in the version with swivelling holder must be mounted so that, after the antenna has been aligned by means of the swivelling holder and the clamping flange has been screwed down, protection class IP 66 is maintained between zone 20 and 21.

12 Versions with rinsing connection

For the VEGAPULS PS6*.CK/DK/RX*****, VEGAPULS PSSR68.CK/DK/RX***** in the version with rinsing connection, please make sure that protection IP 66 is ensured at the connection to the reflux valve. After removal of the reflux valve or the rinsing connection on the reflux valve, the opening must be closed with a suitable plug screw in order to maintain protection IP 66.

Please make sure that there is no explosive atmosphere present during rinsing processes in the antenna or sensor cleaning.

13 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
- Metal housing with inspection window
- Plastic process fittings
- Plastic-coated process fittings and/or plastic-coated sensors
- Connection cable for separate versions
- Type label
- Isolated metallic labels (measuring point identification plate)

Take note in case of danger of electrostatic charges:

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

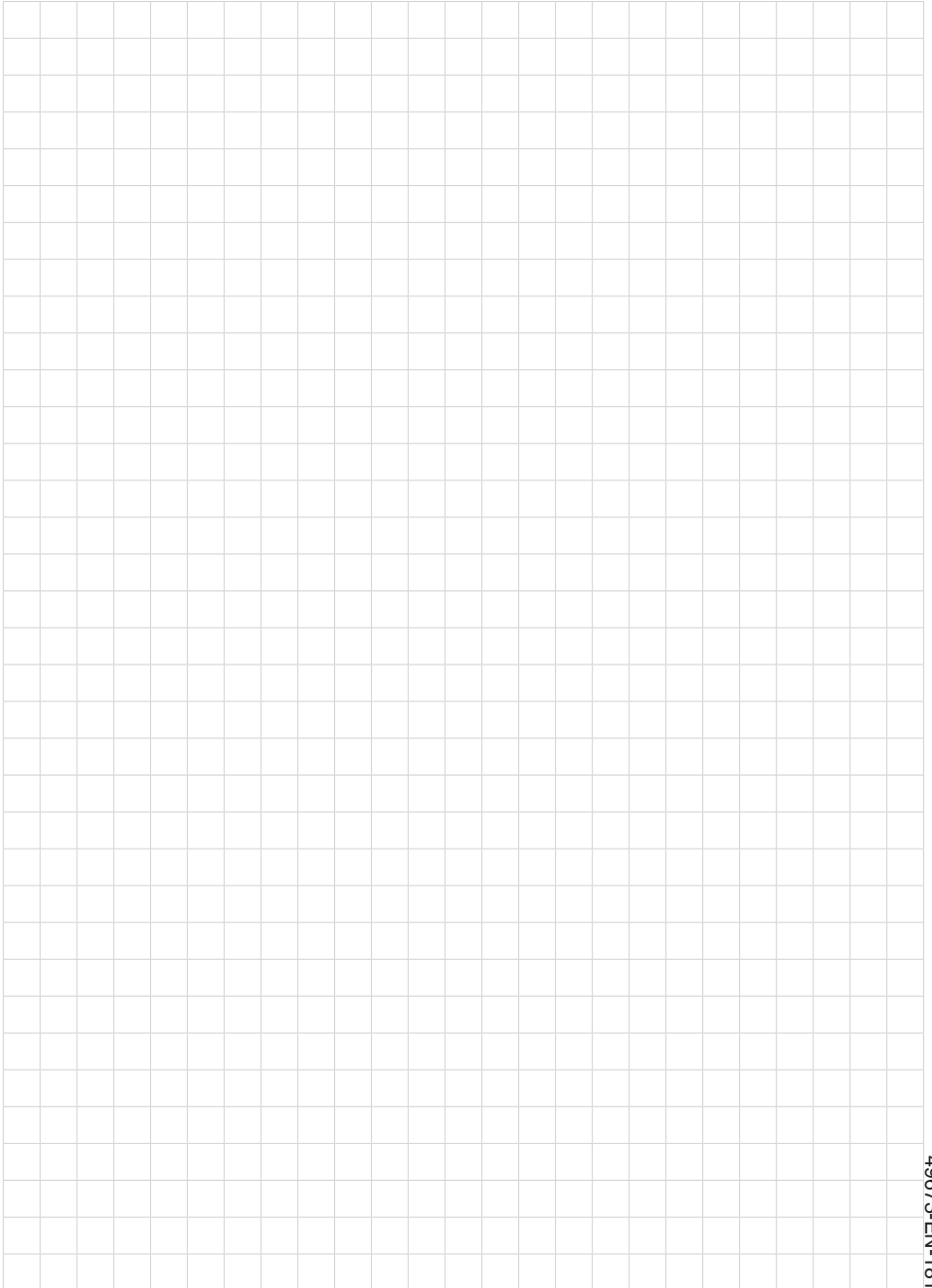
The instruments must be mounted/installed in such a way that the following can be ruled out:

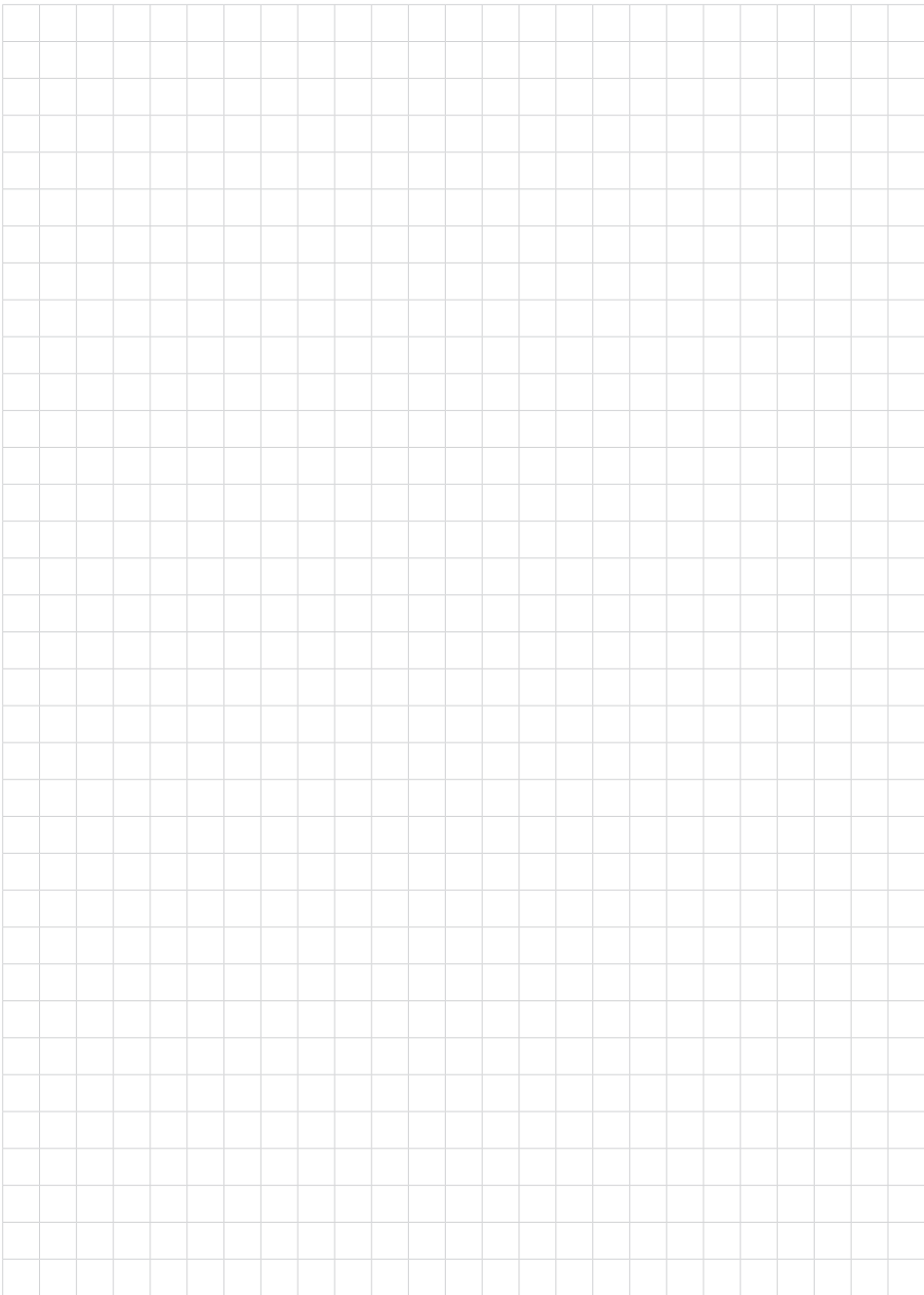
- in the case of extremely flammable dusts with a minimum ignition energy (MIE) of less than 3 mJ, the device must not be used in areas where intensive electrostatic charging processes can be expected
- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing past

The warning label indicates danger:

WARNING- POTENTIAL ELECTROSTATIC
CHARGING HAZARD - SEE INSTRUCTIONS







Printing date:

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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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