



Safety instructions

VEGAFLEX 81, 82, 83, 86

Dust ignition protection

Two-wire 4 ... 20 mA/HART

Two-wire 4 ... 20 mA/HART with SIL qualification

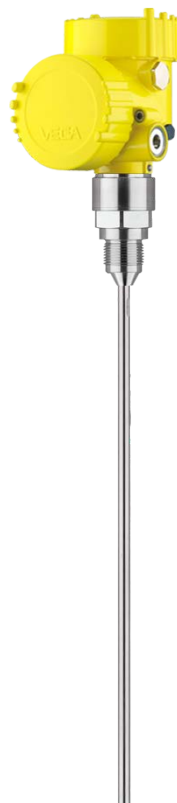
Four-wire 4 ... 20 mA/HART

Modbus

Profibus PA

Foundation Fieldbus

Additional current output 4 ... 20 mA



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VEGA

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Supplementary documentation:

- Operating instructions VEGAFLEX 81, 82, 83, 86
- Quick setup guide VEGAFLEX 81, 82, 83, 86
- Certificate of Compliance CSA2012CA2515397X (Document ID: 49453)

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1 Area of applicability

These safety instructions apply to the VEGAFLEX 81, 82, 83, 86 of type series:

- VEGAFLEX FX8*(*)C/VR****A/H/P/F/B/I/U/WX****
- VEGAFLEX FX8*(*)C/VR****A/HZ****

With the electronics versions:

- H - Two-wire 4 ... 20 mA/HART
- A - Two-wire 4 ... 20 mA/HART with SIL qualification
- B - Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz
- I - Four-wire 4 ... 20 mA/HART; 9,6 ... 48 V DC; 20 ... 42 V AC
- U - Four-wire Modbus (converter in second chamber)
- P - Two-wire Profibus PA
- F - Two-wire Foundation Fieldbus
- Z - Additional current output 4 ... 20 mA

According to Certificate of Compliance CSA2012CA2515397X (certificate number on the type label) and for all instruments with safety instruction 49452.

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

Type of protection marking:

- CL II Div 1, Groups E, F and G; Class III
- CL II Zone 20 AEx/Ex ta IIIC T* Da
- CL II Zone 20/21 AEx/Ex ta/tb IIIC T* Da/Db
- CL II Zone 20/22 AEx/Ex ta/tc IIIC T* Da/Dc
- CL II Zone 22 AEx/Ex Zone 21 tb IIIC T* Db

2 Important specification in the type code

VEGAFLEX FX81(a).bcdefghijklm

Position	Feature	Description
a		One or two-digit alphanumeric variable, for production control. Optional, not safety-relevant.
b	Scope	C cCSAus
		V Combination (Europe, world-wide, USA, CSA)
c	Approval	R CL II Div 1, Groups E, F and G; Class III; CL II Zone 20 AEx/Ex ta IIIC T* Da; CL II Zone 20/21 AEx/Ex ta/tb IIIC T* Da/Db; CL II Zone 20/22 AEx/Ex ta/tc IIIC T* Da/Dc; CL II Zone 22 AEx/Ex Zone 21 tb IIIC T* Db

Position		Feature	Description
d	Version / Material	3	exchangeable coated cable (ø 4 mm) with uncoated centering weight / PFA and 316
		6	exchangeable rod (ø 8 mm) / Duplex (1.4462)
		7	exchangeable cable (ø 2 mm) with gravity weight / Alloy C276 (2.4819)
		A	exchangeable cable (ø 4 mm) with gravity weight / 316
		B	exchangeable cable (ø 2 mm) with gravity weight / 316
		C	exchangeable cable (ø 4 mm) with centering weight / 316
		D	exchangeable cable (ø 2 mm) with centering weight / 316
		E	exchangeable rod (ø 8 mm) / 316L
		F	exchangeable rod (ø 12 mm) / 316L
		G	exchangeable rod (ø 8 mm) / 304L
		H	Coax (ø 21.3 mm) with single hole / 304L
		I	exchangeable cable (ø 4 mm) with gravity weight / Alloy C22 (2.4602)
		J	exchangeable cable (ø 4 mm) with centering weight / Alloy C22 (2.4602)
		K	Coax (ø 21.3 mm) with single hole / 316L
		L	Coax (ø 21.3 mm) with multiple hole / 316L
		N	Coax (ø 21.3 mm) with multiple hole / 304L
		O	exchangeable rod (ø 12 mm) / Alloy C22 (2.4602)
		P	Coax (ø 42.2 mm) with multiple hole / 316L
		Q	Coax (ø 21.3 mm) with multiple hole / Alloy C22 (2.4602)
		R	Coax (ø 42.2 mm) with multiple hole / Alloy C22 (2.4602)
S	exchangeable rod (ø 8 mm) / Alloy C22 (2.4602)		
U	exchangeable cable (ø 4 mm) without weight / 316		
V	exchangeable rod (ø 12 mm) / Alloy 400 (2.4360)		
W	exchangeable rod (ø 8 mm) / Alloy C276 (2.4819)		
*	further approved Versions / Materials		
ef	Process fitting / Material	**	Two-digit alphanumeric variables for process fittings according to industry standard
g	Seal / Second line of defense / Process temperature	A	FKM (SHS EPM 70C3 GLT) / without / -40 ... +80 °C
		D	FFKM (Kalrez 6375) / without / -20 ... +150 °C
		F	FKM (SHS FPM 70C3 GLT) / without / -40 ... +150 °C
		G	FKM (SHS FPM 70C3 GLT) / with / -40 ... +150 °C
		L	FFKM (Kalrez 6375) / with / -20 ... +200 °C
		M	EPDM (A+P 70.10-02) / with / -40 ... +150 °C
		N	Silicone FEP coated (A+P FEP-O-SEAL) / with / -40 ... +150 °C
		P	FFKM (Kalrez 6375) / with / -20 ... +150 °C

Position		Feature	Description
h	Electronics	H	Two-wire 4 ... 20 mA/HART
		A	Two-wire 4 ... 20 mA/HART with SIL qualification
		B	Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz
		I	Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC
		W	Four-wire Modbus
		U	Four-wire Modbus (converter in second chamber)
		P	Two-wire Profibus PA
		F	Two-wire Foundation Fieldbus
i	Supplementary electronics	X	without
		Z	Additional current output 4 ... 20 mA
j	Housing / Protection	A	Aluminium single chamber / IP66/IP68 (0.2 bar)
		D	Aluminium double chamber / IP66/IP68 (0.2 bar)
		H	Special colour Aluminium single 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	1	M20 x 1.5 / without
		D	M20 x 1.5 / Blind plug
		N	½ NPT / Blind plug
		Q	½ NPT / without
		*	Respectively approved cable glands and blind plugs correspond to the ignition protection type
l	Display and adjustment module PLICSCOM	X	without
		A	mounted
		F	without; lid with inspection window
		B	Laterally mounted
		K	mounted; with Bluetooth, magnetic pen operation
		L	laterally mounted; with Bluetooth, magnetic pen operation
m	Certificates	M	Yes
		X	No

VEGAFLEX FX82(a).bcdefghijklm

Position		Feature	Description
a			One or two-digit alphanumeric variable, for production control. Optional, not safety-relevant.
b	Scope	C	cCSAus
		V	Combination (Europe, world-wide, USA, CSA)

Position		Feature	Description
c	Approval	R	CL II Div 1, Groups E, F and G; Class III; CL II Zone 20 AEx/Ex ta II-IC T* Da; CL II Zone 20/21 AEx/Ex ta/tb IIIC T* Da/Db; CL II Zone 20/22 AEx/Ex ta/tc IIIC T* Da/Dc; CL II Zone 22 AEx/Ex Zone 21 tb IIIC T* Db
d	Version / Material	A	exchangeable cable (ø 4 mm) / 316
		F	exchangeable rod (ø 6 mm) / 316
		E	exchangeable steel cable (ø 6 mm with gravity weight / PA coated
		G	exchangeable steel cable (ø 11 mm with gravity weight / PA coated
		H	exchangeable rod (ø 16 mm) / 316L
		T	exchangeable rod (ø 16 mm) / Alloy C22 (2.4602)
		*	further approved Versions / Materials
ef	Process fitting / Material	**	Two-digit alphanumeric variables for process fittings according to industry standard
g	Seal / Process temperature	A	FKM (SHS FPM 70C3 GLT) / -40 ... +80 °C
		B	EPDM (A+P 70.10-02) / -40 ... +80 °C
		F	FKM (SHS FPM 70C3 GLT) / -40 ... +150 °C
		H	EPDM (A+P 70.10-02) / -40 ... +150 °C
		K	FFKM (Kalrez 6375) / -20 ... +200 °C
h	Electronics	H	Two-wire 4 ... 20 mA/HART
		A	Two-wire 4 ... 20 mA/HART with SIL qualification
		B	Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz
		I	Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC
		W	Four-wire Modbus
		U	Four-wire Modbus (converter in second chamber)
		P	Two-wire Profibus PA
		F	Two-wire Foundation Fieldbus
i	Supplementary electronics	X	without
		Z	Additional current output 4 ... 20 mA
j	Housing / Protection	A	Aluminium single chamber / IP66/IP68 (0.2 bar)
		D	Aluminium double chamber / IP66/IP68 (0.2 bar)
		H	Special colour Aluminium single 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)

Position		Feature	Description
k	Cable entry / Connection	1	M20 x 1.5 / without
		D	M20 x 1.5 / Blind plug
		N	½ NPT / Blind plug
		Q	½ NPT / without
		*	Respectively approved cable glands and blind plugs correspond to the ignition protection type
l	Display and adjustment module PLICSCOM	X	without
		A	mounted
		F	without; lid with inspection window
		B	Laterally mounted
		K	mounted; with Bluetooth, magnetic pen operation
		L	laterally mounted; with Bluetooth, magnetic pen operation
m	Certificates	M	Yes
		X	No

VEGAFLEX FX83(a).bcdefghijklm

Position		Feature	Description
a			One or two-digit alphanumeric variable, for production control. Optional, not safety-relevant.
b	Scope	C	cCSAus
		V	Combination (Europe, world-wide, USA, CSA)
c	Approval	R	CL II Div 1, Groups E, F and G; Class III; CL II Zone 20 AEx/Ex ta II-IC T* Da; CL II Zone 20/21 AEx/Ex ta/tb IIIC T* Da/Db; CL II Zone 20/22 AEx/Ex ta/tc IIIC T* Da/Dc; CL II Zone 22 AEx/Ex Zone 21 tb IIIC T* Db
d	Version / Material	B	exchangeable cable (ø 4 mm) with gravity weight / PFA
		F	exchangeable rod (ø 8 mm) / 1.4435 (BN2), (Ra<0,76µm)
		G	exchangeable rod (ø 8 mm) / 1.4435 (BN2), can be autoclaved (Ra<0,76µm)
		E	Rod (ø 10 mm) / PFA
		H	exchangeable rod (ø 8 mm) / 1.4435 (BN2), electropolished (Ra<0,38µm)
		I	exchangeable rod (ø 8 mm) / 1.4435 (BN2), electropolished, can be autoclaved (Ra<0,38µm)
		*	further approved Versions / Materials
ef	Process fitting / Material	**	Two-digit alphanumeric variables for process fittings according to industry standard
g	Seal / Process temperature	X	without / -40 ... +150 °C
		E	FFKM (Kalrez 6221) / -20 ... +150 °C
		C	EPDM (Freudenberg 70, EPDM 291) / -20 ... +130 °C
		T	FEPM (Vi 602 Extreme-ETP, COG) / -10 ... +150 °C

Position		Feature	Description
h	Electronics	H	Two-wire 4 ... 20 mA/HART
		A	Two-wire 4 ... 20 mA/HART with SIL qualification
		B	Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz
		I	Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC
		W	Four-wire Modbus
		U	Four-wire Modbus (converter in second chamber)
		P	Two-wire Profibus PA
		F	Two-wire Foundation Fieldbus
i	Supplementary electronics	X	without
		Z	Additional current output 4 ... 20 mA
j	Housing / Protection	A	Aluminium single chamber / IP66/IP68 (0.2 bar)
		D	Aluminium double chamber / IP66/IP68 (0.2 bar)
		H	Special colour Aluminium single 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	1	M20 x 1.5 / without
		D	M20 x 1.5 / Blind plug
		N	½ NPT / Blind plug
		Q	½ NPT / without
		*	Respectively approved cable glands and blind plugs correspond to the ignition protection type
l	Display and adjustment module PLICSCOM	X	without
		A	mounted
		F	without; lid with inspection window
		B	Laterally mounted
		K	mounted; with Bluetooth, magnetic pen operation
		L	laterally mounted; with Bluetooth, magnetic pen operation
m	Certificates	M	Yes
		X	No

VEGAFLEX FX86(a).bcdefghijklm

Position		Feature	Description
a			One or two-digit alphanumeric variable, for production control. Optional, not safety-relevant.
b	Scope	C	cCSAus
		V	Combination (Europe, world-wide, USA, CSA)

Position		Feature	Description
c	Approval	R	CL II Div 1, Groups E, F and G; Class III; CL II Zone 20 AEx/Ex ta II-IC T* Da; CL II Zone 20/21 AEx/Ex ta/tb IIIC T* Da/Db; CL II Zone 20/22 AEx/Ex ta/tc IIIC T* Da/Dc; CL II Zone 22 AEx/Ex Zone 21 tb IIIC T* Db
d	Version / Material	4	Coax (ø 42.2 mm) with multiple hole and reference distance / 316L
		5	Coax (ø 42.2 mm) with multiple hole and reference distance / Alloy C22 (2.4602)
		6	exchangeable rod (ø 8 mm) / Duplex (1.4462)
		A	exchangeable cable (ø 4 mm) with gravity weight / 316
		B	exchangeable cable (ø 2 mm) with gravity weight / 316
		C	exchangeable cable (ø 4 mm) with centering weight / 316
		D	exchangeable cable (ø 2 mm) with centering weight / 316
		E	exchangeable rod (ø 8 mm) / 316L
		H	exchangeable rod (ø 16 mm) / 316L
		I	exchangeable cable (ø 4 mm) with gravity weight / Alloy C22 (2.4602)
		J	exchangeable cable (ø 4 mm) with centering weight / Alloy C22 (2.4602)
		L	Coax (ø 21.3 mm) with multiple hole / 316L
		P	Coax (ø 42.2 mm) with multiple hole / 316L
		R	Coax (ø 42.2 mm) with multiple hole / Alloy C22 (2.4602)
		T	exchangeable rod (ø 16 mm) / Alloy C22 (2.4602)
		W	exchangeable rod (ø 8 mm) / Alloy C276 (2.4819)
		*	further approved Versions / Materials
ef	Process fitting / Material	**	Two-digit alphanumeric variables for process fittings according to industry standard
g	Seal / Second line of defense / Process temperature	1	Ceramic-graphite / with / -196 ... +280 °C
		2	Ceramic-graphite / with / -196 ... +400 °C
		2	Ceramic-graphite / with / -196 ... +450 °C
		3	PEEK-FFKM (Kalrez 6375) / with / -20 ... +250 °C
h	Electronics	H	Two-wire 4 ... 20 mA/HART
		A	Two-wire 4 ... 20 mA/HART with SIL qualification
		B	Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz
		I	Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC
		W	Four-wire Modbus
		U	Four-wire Modbus (converter in second chamber)
		P	Two-wire Profibus PA
		F	Two-wire Foundation Fieldbus
i	Supplementary electronics	X	without
		Z	Additional current output 4 ... 20 mA

Position		Feature	Description
j	Housing / Protection	A	Aluminium single chamber / IP66/IP68 (0.2 bar)
		D	Aluminium double chamber / IP66/IP68 (0.2 bar)
		H	Special colour Aluminium single 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	1	M20 x 1.5 / without
		D	M20 x 1.5 / Blind plug
		N	½ NPT / Blind plug
		Q	½ NPT / without
		*	Respectively approved cable glands and blind plugs correspond to the ignition protection type
l	Display and adjustment module PLICSCOM	X	without
		A	mounted
		F	without; lid with inspection window
		B	Laterally mounted
		K	mounted; with Bluetooth, magnetic pen operation
		L	laterally mounted; with Bluetooth, magnetic pen operation
m	Certificates	M	Yes
		X	No

Multiple listed characteristics according to the dependencies of the device configuration.

In the following, all above mentioned versions are called VEGAFLEX 81, 82, 83, 86. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

3 General information

The level measuring instruments VEGAFLEX 81, 82, 83, 86 as guided radar sensors are used to detect 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 VEGAFLEX 81, 82, 83, 86 consist of an electronics housing, a process connection element and a sensor, i.e. a measuring cable or a measuring rod. As an option, the display and adjustment module can also be installed in the instrument.

4 Application area

The VEGAFLEX 81, 82, 83, 86 are suitable for use in potentially explosive atmospheres of class II, DIV1, where combustible dusts of group E, F, G may be present.

The VEGAFLEX 81, 82, 83, 86 are suitable for applications in class III.

VEGAFLEX FX8*(*) .C/VR****A/H/F/P/U/W***** and FX*(*) .C/VR****A/HZ***** are used for monitoring or control in areas with flammable, dust-generating bulk solids that require instruments with (DIP) approval.

5 Special operating conditions

The following overview is listing all special properties of VEGAFLEX 81, 82, 83, 86, 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.

Non-grounded, metallic parts

The resistance between aluminium housing to metal measuring point identification plate is $> 10^9$ Ohm.

The capacitance of the metal measuring point identification plate was measured as follows:

Measurement loop identification label	Capacitance
45 x 23 mm (standard)	21 pF
100 x 30 mm	52 pF
73 x 47 mm	61 pF

6 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 relevant valid regulations which are necessary for the safe installation and operation of the device.
- 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, National Electrical Code 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
- Components for installation and connection not included in the approval documents are only permitted if these correspond technically to the latest standard mentioned on the cover sheet. They must be suitable for the application conditions and have a separate certificate. The special conditions of the components must be noted and if necessary, the components must be integrated in the type test. This applies also to the components already mentioned in the technical description.
- Vessel installations and probable flow must be taken into account

Cable and wire entries

- The VEGAFLEX 81, 82, 83, 86 must be connected via suitable cable gland or conduit systems that are in conformity with the requirements of the type of protection and the IP protection or NEMA rating and provided with a separate type approval certificate. When connecting VEGAFLEX 81, 82, 83, 86 to conduit systems, the corresponding sealing facility must be connected directly to the housing.

- 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 approved cable entries or closing screws suitable for the respective ignition protection type and IP protection or NEMA rating.
- Note type and size of the thread: A label with the respective thread name is in the area of the respective thread
- Threads must have no damages
- Cable entries and closing screws should be mounted correctly and according to the safety instructions of the manufacturer to ensure the specified ignition protection type and IP protection rating or NEMA rating. When using certified or suitable cable glands, closing screws or plug connections, it is absolutely necessary to note the corresponding certificates/documents. Supplied cable entries or closing screws meet these requirements.
- Unused openings must be closed with plugs suitable for the ignition protection type and IP protection or NEMA rating. Supplied plugs meet these requirements.
- Cable or wire entries resp. the closing screws must be tightly screwed into the housing
- The connection cables resp. pipeline sealing facilities must be suitable for the application conditions (e.g. temperature range) of the application
- With surface temperatures > 70 °C, the cables must be suitable for the higher application conditions
- The connection cable of VEGAFLEX 81, 82, 83, 86 has to be wired fix and in such a way that damages can be excluded.

Single chamber housing



- 1 Lid, optionally with inspection window
- 2 Electronics compartment
- 3 Label: Thread type
- 4 Screw plug
- 5 External ground terminal
- 6 Red threaded or dust protection cap
Transport protection, replace with installation
- 7 Locking screws of the lid for lid locking

Double chamber housing



- 1 Lid, optionally with inspection window
- 2 Electronics compartment
- 3 Screw plug
- 4 Connection compartment
- 5 Transport protection, replace with installation
Red threaded or dust protection cap
- 6 Label: Thread type
- 7 Locking screws of the lid for lid locking
- 8 Lid, optionally with inspection window
- 9 Locking screws of the lid for lid locking

Mounting

When installing the device, observe the following:

- The instrument must be connected to the grounding system (via the process fitting or an external grounding clamp)
- Mechanical damage on the instrument must be avoided
- Impact and friction sparks are to be avoided

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 VEGAFLEX 81, 82, 83, 86 being in contact with flammable media during operation must be included in the periodic overpressure test of the plant.

Dust ignition protection

- The terminals for connecting the operating voltage or signal circuits are integrated in the connection compartment with type of protection dust explosion protection by housing "t"
- Cable, wire entries and the closing screws must be certified acc. to ignition protection type dust ignition protection by enclosure (DIP)
- All field wiring entries must be sealed during installation with appropriately approved products using a profile that meets the requirements of the type of protection

- Separately certified cable and wire entries can determine the permissible ambient temperature range or the temperature classes

Version with exchangeable cable or rod probe

Only original VEGA cable or rod probes must be mounted to VEGAFLEX 81, 82, 83, 86. When mounting cable or rod probes, the torques specified in the respective operating instruction manuals must be maintained. The mechanical connection must be ensured.

7 Safe operating mode

General operating conditions

- Do not operate the instrument outside the electrical, thermal and mechanical specifications of the manufacturer
- Use the instrument only in media against which the wetted parts are sufficiently resistant
- To assess and reduce the explosion risk, the National Electrical Code applicable regulations, rules and standards must be taken into account
- 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
- 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*".
- If necessary, a suitable overvoltage arrester can be connected in front of the VEGAFLEX 81, 82, 83, 86
- 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

AVERTISSEMENT -- NE PAS OUVRIR SI UNE ATMOSPHÈRE EXPLOSIVE PEUT ÊTRE PRÉSENTE

8 Potential equalization/Grounding

- Integrate the instruments into the local potential equalisation, e.g. via the internal or external earth terminal
- The potential equalization terminal must be secured against loosening and twisting
- If grounding of the cable screening is necessary, this must be carried out acc. to the valid standards and regulations

9 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:

- 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

AVERTISSEMENT -- DANGER POTENTIEL DE CHARGES
ÉLECTROSTATIQUES -- VOIR INSTRUCTIONS

10 Electrical data

For the electronic versions A/H/P/F/U/W it must be observed, that when installed in DIV1, the maximum power at the sensor must be limited to the $P_{max} \leq 2 \text{ W}$.

VEGAFLEX FX8*(*)C/VR****A/HX****

Supply and signal circuit in the electronics and connection compartment, single chamber housing:	
Terminals 1[+], 2[-]	$U = 9.6 \dots 35 \text{ V DC}$ $U_m = 253 \text{ V AC/DC}$ $I \leq 3.5 \dots 22.5 \text{ mA}$ (with superimposed HART signal)

VEGAFLEX FX8*(*)C/VR****A/HX****

Supply and signal circuit in the connection compartment, double chamber housing:	
Terminals 1[+], 2[-]	$U = 9.6 \dots 35 \text{ V DC}$ $U_m = 253 \text{ V AC/DC}$ $I \leq 3.5 \dots 22.5 \text{ mA}$ (with superimposed HART signal)

VEGAFLEX FX8*(*)C/VR****A/HZ****

Supply and signal circuit in the connection compartment, double chamber housing:	
Terminals 1[+], 2[-]	$U = 9.6 \dots 35 \text{ V DC}$ $U_m = 253 \text{ V AC/DC}$ $I \leq 3.5 \dots 22.5 \text{ mA}$ (with superimposed HART signal)
Terminals 7[+], 8[-]	$U = 9.6 \dots 35 \text{ V DC}$ $U_m = 253 \text{ V AC/DC}$ $I \leq 3.5 \dots 22.5 \text{ mA}$ (with superimposed HART signal)

VEGAFLEX FX8*(*).C/VR/H/I/J**BX******

Supply circuit in the connection compartment of the double chamber housing:	
Terminals 1[+], 2[-]	U = 90 ... 253 V AC U _m = 253 V AC/DC
Active 4 ... 20 mA signal circuit in the connection compartment, double chamber housing:	
Terminals 5[+], 7[-]	U _m = 60 V AC/DC I ≤ 3.5 ... 22.5 mA (with superimposed HART signal)
Passive 4 ... 20 mA signal circuit in the connection compartment, double chamber housing:	
Terminals 6[+], 7[-]	U _m = 60 V AC/DC I ≤ 3.5 ... 22.5 mA (with superimposed HART signal)

VEGAFLEX FX8*(*).C/VR/H/I/J**IX******

Supply circuit in the connection compartment of the double chamber housing:	
Terminals 1[+], 2[-]	U = 9.6 ... 48 V DC; 42 V AC U _m = 253 V AC
Active 4 ... 20 mA signal circuit in the connection compartment, double chamber housing:	
Terminals 5[+], 7[-]	U _m = 60 V AC/DC I ≤ 3.5 ... 22.5 mA (with superimposed HART signal)
Passive 4 ... 20 mA signal circuit in the connection compartment, double chamber housing:	
Terminals 6[+], 7[-]	U _m = 60 V AC/DC I ≤ 3.5 ... 22.5 mA (with superimposed HART signal)

VEGAFLEX FX8*(*).C/VR**WX******

Supply and signal circuit in the connection compartment, single chamber housing:	
Terminals 1[+], 2[-] for single chamber housing in the electronics and connection compartment	U = 8 ... 30 V DC
Signal circuit Modbus:	
Terminals 3[D0(+)], 4[D1(-)]	for single chamber housing in the electronics and connection compartment
Function ground:	
Terminals 5	for single chamber housing in the electronics and connection compartment

VEGAFLEX FX8*(*).C/VR**UX******

Supply circuit in the connection compartment of the double chamber housing:	
Terminals 1[+], 2[-]	U = 8 ... 32 V DC

Signal circuit in the connection compartment of the double chamber housing:	
Terminals MB[+], MB[-]	U = 5 V with Modbus signal (telegram)
USB connection: (6-pole mini USB socket)	U _{max} = 5 V with USB signal (USB protocol)

VEGAFLEX FX8*(*)C/VR****P/FX****

Supply and signal circuit in the electronics and connection compartment, single chamber housing:
Supply and signal circuit in the connection compartment, double chamber housing:

Terminals 1[+], 2[-]	U = 9 ... 32 V DC U _m = 253 V AC/DC
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Display and adjustment circuit:	
Terminals 5, 6, 7, 8	For connection to the circuit of the passive indicating unit VEGADIS 81 in ignition protection type DIP.

Display and adjustment circuit:	
Spring contacts in the connection compartment	Only for connection to the display and adjustment module PLICSCOM or for service purposes the interface adapter VEGACONNECT, if it is ensured that no explosive atmosphere is present.

The circuits of VEGAFLEX FX8*(*)C/VR****A/H/P/F/U/W***** are galvanically separated from ground.

The metallic parts of VEGAFLEX 81, 82, 83, 86 are electrically connected with the earth terminals.

11 Mechanical data

The following mechanical data are valid for all housing and electronics versions.

Mechanical data	
Ground terminal (connection cross-section)	≥ 4 mm ²
Housing protection rating	IP66/4X/6P
<ul style="list-style-type: none"> ● Materials ● Max. tensile load on the cable or rod probe ● Potential connections and electrical separating measures in the instrument ● Electromechanical data ● Electrical protective measures 	Are described in the operating instructions VEGAFLEX 81, 82, 83, 86 in chapter "Technical data".

12 Thermal data

The following ambient temperature ranges and surface temperatures apply to applications requiring instruments suitable for use in Class II, DIV1 and Class III hazardous areas:

On the sensor, limited by seal

Permissible process temperature on the sensor:	
VEGAFLEX FX81(*)..****AA/H/B/I/U/P/F****	-40 ... +80 °C
VEGAFLEX FX81(*)..****AA/HZ****	-40 ... +80 °C
VEGAFLEX FX81(*)..****D/F/PA/H/B/I/U/P/F****	-20 ... +150 °C
VEGAFLEX FX81(*)..****D/F/PA/HZ****	-20 ... +150 °C
VEGAFLEX FX81(*)..****G/M/NA/H/B/I/U/P/F****	-40 ... +150 °C
VEGAFLEX FX81(*)..****G/M/NA/HZ****	-40 ... +150 °C
VEGAFLEX FX81(*)..****LA/H/B/I/U/P/F****	-20 ... +200 °C
VEGAFLEX FX81(*)..****LA/HZ****	-20 ... +200 °C
VEGAFLEX FX82(*)..****A/BA/H/B/I/U/P/F****	-40 ... +80 °C
VEGAFLEX FX82(*)..****A/BA/HZ****	-40 ... +80 °C
VEGAFLEX FX82(*)..****F/HA/HZ****	-40 ... +150 °C
VEGAFLEX FX82(*)..****F/HA/H/B/I/U/P/F****	-40 ... +150 °C
VEGAFLEX FX82(*)..****KA/H/B/I/U/P/F****	-20 ... +200 °C
VEGAFLEX FX82(*)..****KA/HZ****	-20 ... +200 °C
VEGAFLEX FX83(*)..****XA/H/B/I/U/P/F****	-40 ... +150 °C
VEGAFLEX FX83(*)..****XA/HZ****	-40 ... +150 °C
VEGAFLEX FX83(*)..****CA/H/B/I/U/P/F****	-20 ... +130 °C
VEGAFLEX FX83(*)..****CA/HZ****	-20 ... +130 °C
VEGAFLEX FX83(*)..****EA/H/B/I/U/P/F****	-20 ... +150 °C
VEGAFLEX FX83(*)..****EA/HZ****	-20 ... +150 °C
VEGAFLEX FX83(*)..****TA/H/B/I/U/P/F****	-10 ... +150 °C
VEGAFLEX FX83(*)..****TA/HZ****	-10 ... +150 °C
VEGAFLEX FX86(*)..****1A/H/B/I/U/P/F****	-196 ... +280 °C
VEGAFLEX FX86(*)..****1A/HZ****	-196 ... +280 °C
VEGAFLEX FX86(*)..****2A/H/B/I/U/P/F****	-196 ... +450 °C (+400 °C)
VEGAFLEX FX86(*)..****2A/HZ****	-196 ... +450 °C (+400 °C)
VEGAFLEX FX86(*)..****3A/H/B/I/U/P/F****	-20 ... +250 °C
VEGAFLEX FX86(*)..****3A/HZ****	-20 ... +250 °C
Permissible ambient temperature on the electronics housing:	
	-40 °C ≤ Ta ≤ +60 °C

Surface temperature increases

VEGAFLEX 8* Installation in DIV1:

FX8(*)..*/VR/H/I/J****A/HX****, P _{max} < 2 W	Process/ambient temperature +86 K
FX8(*)..*/VR/H/I/J****A/HZ****, P _{max} < 2 W	Process/ambient temperature +86 K
FX8(*)..*/VR/H/I/J****P/FX****, P _{max} < 2 W	Process/ambient temperature +86 K
FX8(*)..*/VR/H/I/J****U/WX****, P _{max} < 2 W	Process/ambient temperature +86 K

VEGAFLEX 8* Installation in DIV2:

FX8(*)..*/VR/H/I/J****A/HX****	Ambient temperature +38 K (38 K = (41.1 K/W x 828 mW) + 4 K)
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FX8*(*)*/VR/H//J****A/HZ****	Ambient temperature +38 K (38 K = (41.1 K/W x 828 mW) + 4 K)
FX8*(*)*/VR/H//J****P/FX****	Ambient temperature +20 K (20 K = (41.1 K/W x 401 mW) + 4 K)
FX8*(*)*/VR/H//J****U/WX****	Ambient temperature +24 K (24 K = (41.1 K/W x 500 mW) + 4 K)

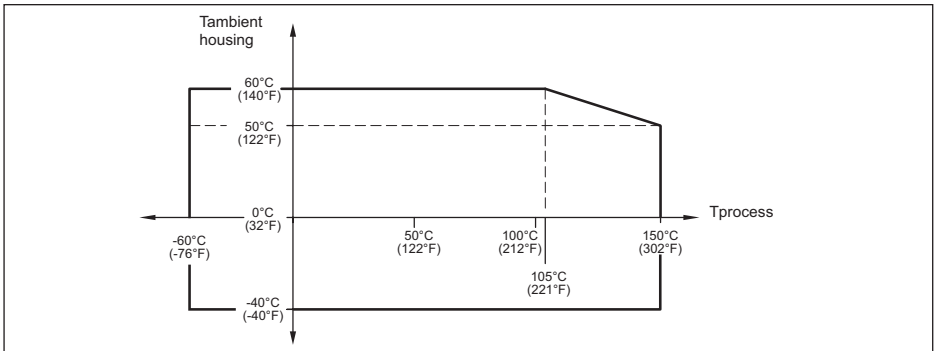
The sensors may only be operated in areas for DIV1 and DIV2 applications if atmospheric conditions are present.

If there is no explosive atmosphere, the permissible operating temperatures and pressures must be taken from the manufacturer specifications (operating instructions).

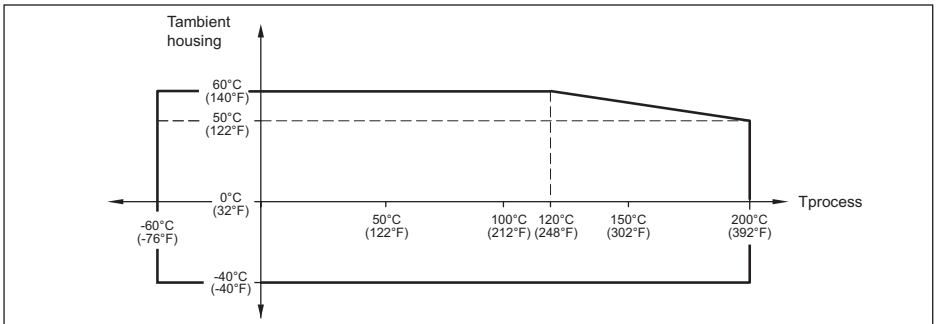
If the sensors (measuring cable, measuring rod) are operated at temperatures higher than those listed in the table above, measures must be taken to prevent the risk of ignition from hot surfaces.

Temperature derating for process temperatures up to +150 °C, +200 °C, +250 °C, +280 °C and +450 °C

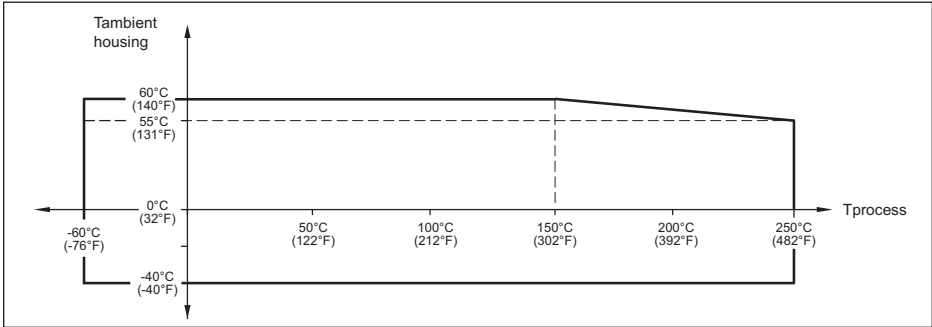
Versions for process temperatures up to +150 °C



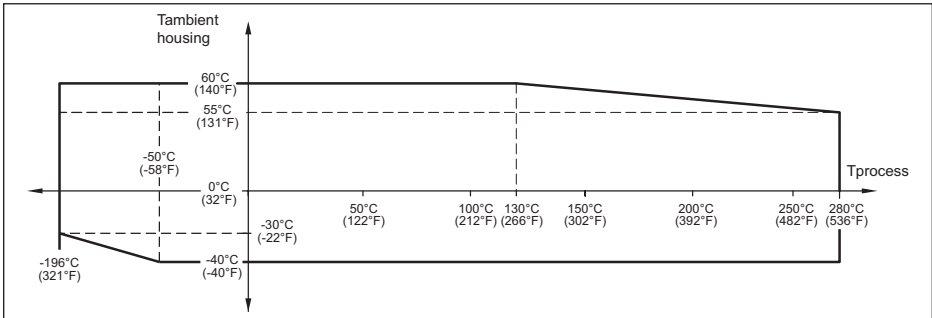
Versions for process temperatures up to +200 °C



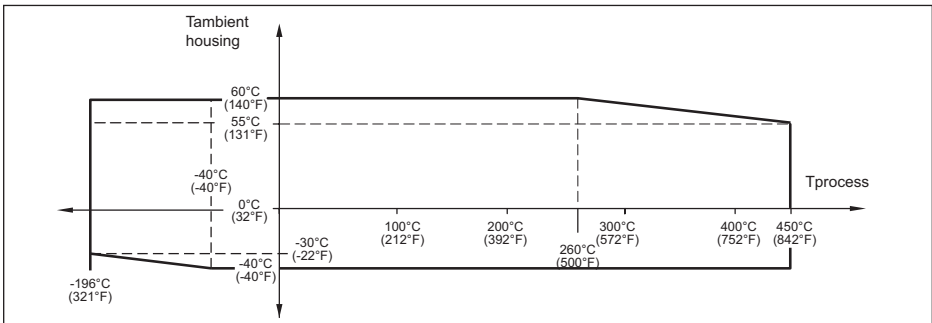
Versions for process temperatures up to +250 °C



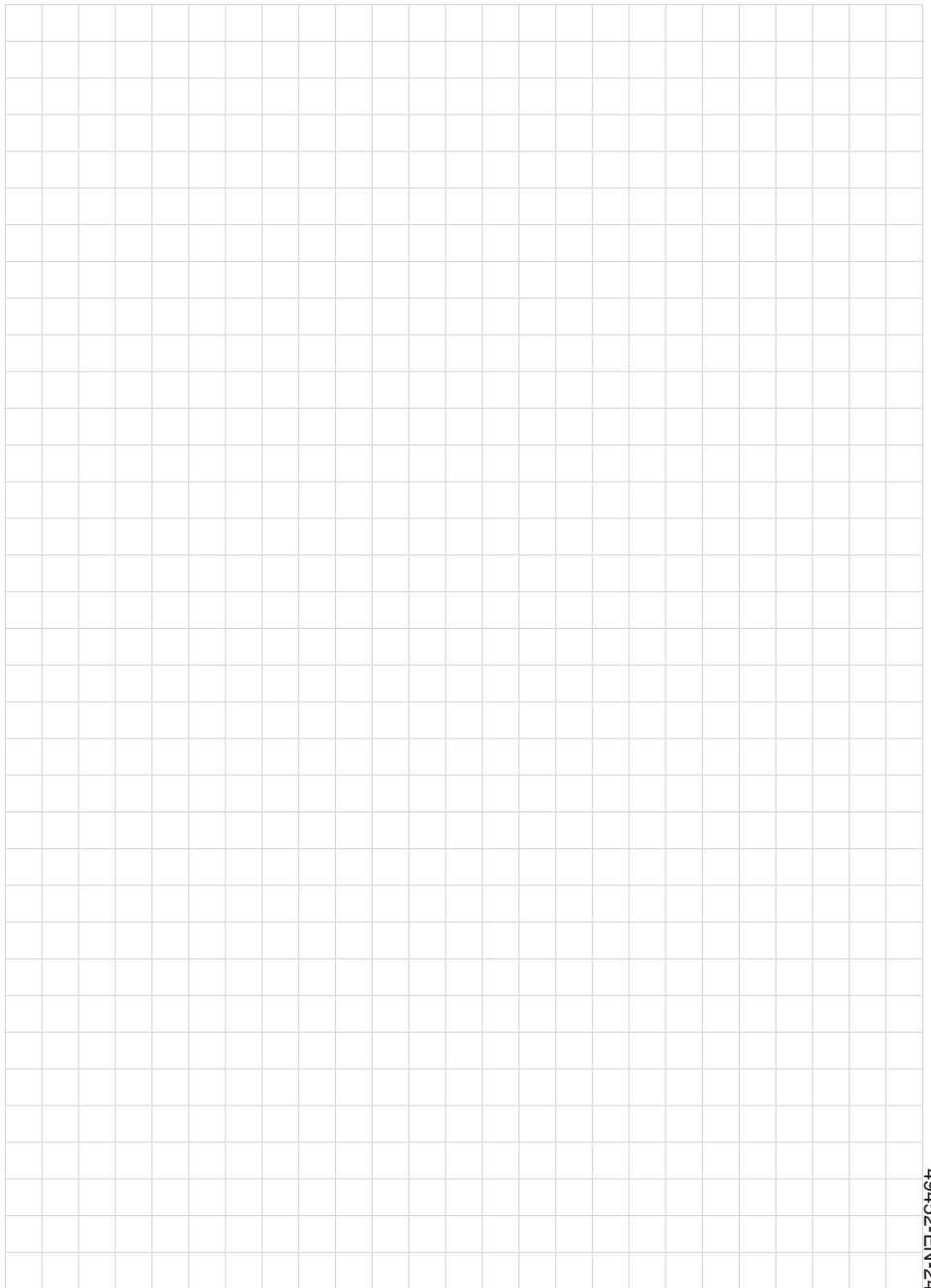
Versions for process temperatures up to +280 °C



Versions for process temperatures up to +450 °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.

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