Safety instructions
VEGAMIP T61, R61, R62

Protection by enclosure
IECEx BVS 09.0054
Relay (DPDT)
Transistor (NPN/PNP)

Document ID: 41673

Contents

Supplementary documentation:

- Operating instructions VEGAMIP T61, R61, R62
- Certificate of Conformity IECEx BVS 09.0054, Issue No. 4 (Document ID: 41674)

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1 Area of applicability

These safety instructions apply to the microwave emitter/receiver for point level detection VEGAMIP of type series:

- VEGAMIP MPT61(*).GX/DK****T***
- VEGAMIP MPR61(*).GX/DK****R/T***
- VEGAMIP MPR62(*).GX****R/T*****

with the electronics versions

- R - Relay (DPDT)
- T - Transistor (NPN/PNP)

according to Certificate of Conformity IECEx BVS 09.0054, Issue No. 4 (certificate number on the type label) and for all instruments with safety instruction 41673.

The classification

Ex ta IIIC T.. Da IP66

Ex ta/tb IIIC T.. Da/Db IP66

Ex ta/tc IIIC T.. Da/Dc IP66

Ex tb IIIC T.. Db IP66

as well as the respective standards

IEC 60079-0: 2012 + A11: 2013

IEC 60079-31: 2014

can be taken from the Certificate of Conformity IECEx BVS 09.0054, Issue No. 4:

The above mentioned versions can have further approvals apart from ignition protection type "protection by enclosure t".

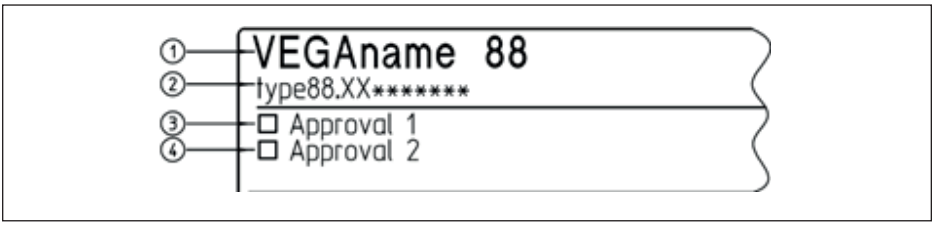
These further approvals are **not** subject of the assessment and evaluation acc. to the Certificate of Conformity IECEx BVS 09.0054.

	Approval	**Combination**		
VEGAMIP MP*6*.	**IECEx**	**Ex t**	**+ Ex ia**	**+ Ex d**
DK	x	x		x
GX	x	x		

In the following, all above mentioned versions are called VEGAMIP T61, R61, R62. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

2 Different ignition protection types

The VEGAMIP T61, R61 in version VEGAMIP MP*61(*).DK****R/T*** can be either used in hazardous dust atmospheres or in hazardous gas atmospheres. The operator must specify the selected ignition protection type before installation. The selected ignition protection type must be marked by scratching off on the identification mark of the type label.



1 VEGAMIP T61, R61, R62
2 Instrument version
3 Identificatiion label: Approval in dust ignition protection type e. g. „Ex t“
4 Identificatiion label: Approval in Gas ignition protection type e. g. „Ex i“, „Ex d“

If VEGAMIP T61, R61, R62 is installed in a gas atmosphere, then the safety instructions and the instructions in the respective certificates must be noted:

Installation	Approval	Certificate	Safety instruction
Gas	"DX"	IECEx BVS 11.0098	41795

3 Important specification in the type code

VEGAMIP MPT61(*).aabdef**, MPR61(*).aab**def****

Position		Feature	Description
a	Approval	DK	IECEx Ex d IIC Ga/Gb, Gb, Ex ta, ta/tb, ta/tc, tb IIIC T.. Da, Da/Db, Da/Dc, Db IP66
		GX	IECEx Ex ta, ta/tb, ta/tc, tb IIIC T.. Da, Da/Db, Da/Dc, Db IP66
b	Version / Material	A	Inside horn antenna (ø 1½") / 316L with PTFE cover
		B	with horn antenna (ø 40 mm) / 316L
		C	with horn antenna (ø 48 mm) / 316L
		D	with horn antenna (ø 75 mm) / 316L
		E	with horn antenna (ø 95 mm) / 316L
		F	Plastic horn antenna (ø 80 mm) / PP
		J	with horn antenna (ø 40 mm) / 1.4848
		X	For separate horn antenna
d	Seal / Process temperature	1	FKM (A+P FPM 70.16-06) / -40 … +80 °C
		2	FKM (SHS FPM 70C3 GLT) / -40 … +130 °C
		3	FFKM (Kalrez 6375) / -20 … +130 °C
		4	PP / -40 … +80 °C
		8	PTFE / -40 … +200 °C
		9	PTFE+Viton / -25 … +130 °C
e	Electronics	R	Relay (DPDT) 20 … 72 V DC/20 … 253 V AC (3 A) (only for MPR61)
		T	Transistor (NPN/PNP) 20 … 55 V DC

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Position		Feature	Description
f	Housing / Protection	A	Aluminium single chamber / IP 66/IP 68 (0.2 bar)
		V	Stainless steel single chamber (precision casting) / IP 66/IP 68 (0.2 bar)
		H	Special colour Aluminium / IP 66/IP 68 (0.2 bar)

MPR62(*).aabdefg***

Position		Feature	Description
a	Approval	GX	IECEx Ex ta, ta/tb, ta/tc, tb IIIC T.. Da, Da/Db, Da/Dc, Db IP66
b	Version / Material	A	Inside horn antenna (ø 1½") / 316L with PTFE cover
		B	with horn antenna (ø 40 mm) / 316L
		C	with horn antenna (ø 48 mm) / 316L
		D	with horn antenna (ø 75 mm) / 316L
		E	with horn antenna (ø 95 mm) / 316L
		F	Plastic horn antenna (ø 80 mm) / PP
		J	with horn antenna (ø 40 mm) / 1.4848
		X	For separate horn antenna
d	Seal / Process temperature	1	FKM (A+P FPM 70.16-06) / -40 … +80 °C
		2	FKM (SHS FPM 70C3 GLT) / -40 … +130 °C
		3	FFKM (Kalrez 6375) / -20 … +130 °C
		4	PP / -40 … +80 °C
		8	PTFE / -40 … +200 °C
		9	PTFE+Viton / -25 … +130 °C
e	Electronics	R	Relay (DPDT) 20 … 72 V DC/20 … 253 V AC (3 A) (only for MPR61)
		T	Transistor (NPN/PNP) 20 … 55 V DC
f	Sensor housing / Protection	A	Aluminium single chamber / IP 66/IP 68 (0.2 bar)
		V	Stainless steel single chamber (precision casting) / IP 66/IP 68 (0.2 bar)
		H	Special colour Aluminium / IP 66/IP 68 (0.2 bar)
g	Housing / Protection	A	Aluminium single chamber / IP 66/IP 68 (0.2 bar)
		V	Stainless steel single chamber (precision casting) / IP 66/IP 68 (0.2 bar)
		H	Special colour Aluminium / IP 66/IP 68 (0.2 bar)

4 General information

The VEGAMIP are used for level detection of liquids and bulk solids.

The VEGAMIP consist of an electronics housing, the process fittings and a sensor or an antenna.

The VEGAMIP are suitable for use in areas with combustible, dust generating bulk solids of substance groups IIIA, IIIB and IIIC. These sensors are suitable for applications requiring category EPL Da, EPL Da/Db, EPL Da/Dc or EPL Db instruments.

5 Application area

EPL Da instrument
The electronics housing and the antennas with the mechanical fixing element are installed in explosion-endangered areas of zone 20 requiring EPL Da instruments.

EPL Da/Db instrument
The electronics housing is installed in hazardous areas of zone 21 requiring EPL Db instruments. The process connection element is installed in the separating wall, which separates areas requiring EPL Db or EPL Da instruments. The sensor with the mechanical fixing element is installed in hazardous areas of zone 20 requiring EPL Da instruments.

EPL Da/Dc instrument
The electronics housing is installed in hazardous areas of zone 22 requiring a EPL Dc instrument.

The process connection cables come from an area where the use of an EPL-Da instruments is required.

EPL Db instrument
The electronics housing and the sensor with the mechanical fixing element are installed in explosion-endangered areas of zone 21 requiring instruments of EPL Db.

VEGA Instrument	EPL Dc	EPL Db	EPL Da/Db	EPL Da
Ex Zone 22 				
Ex Zone 21 				
Ex Zone 20 				

VEGA Instrument	EPL Da/Dc
Ex Zone 22 	
Ex Zone 20 	

6 Special operating conditions

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

Impact and friction sparks
The VEGAMIP T61, R61, R62 in light metal versions (e.g. aluminium, titanium, zircon) must be mounted in such a way that sparks from impact and friction between light metals and steel (except stainless steel, if the presence of rust particles can be excluded) cannot occur.

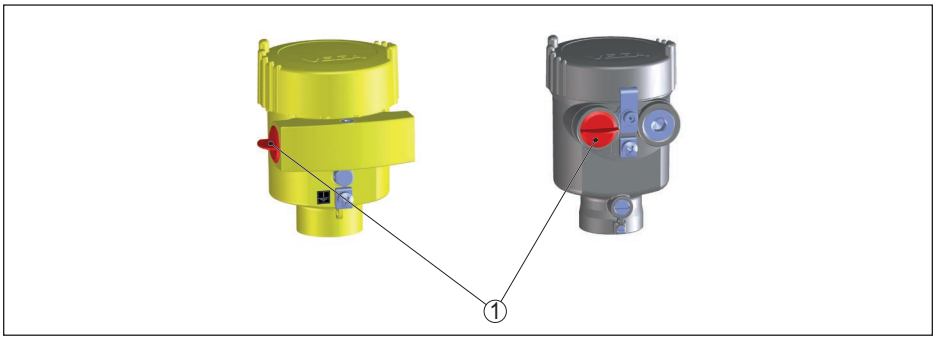
When used as Da/Db or Da/Dc instrument
For versions with standard process fittings, the installation must be made in such a way that at least protection rating IP 67 acc. to IEC/EN 60529 is reached on the process fittings.

7 Important information for mounting and maintenance

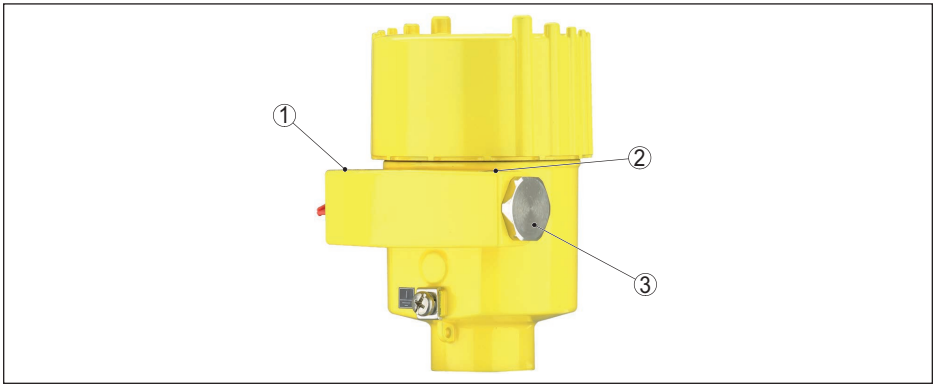
General instructions
The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:

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

Cable and wire entries
- 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.
- 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. 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. 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 VEGAMIP T61, R61, R62 has to be wired fix and in such a way that damages can be excluded



1 *Red threaded or dust protection cap*

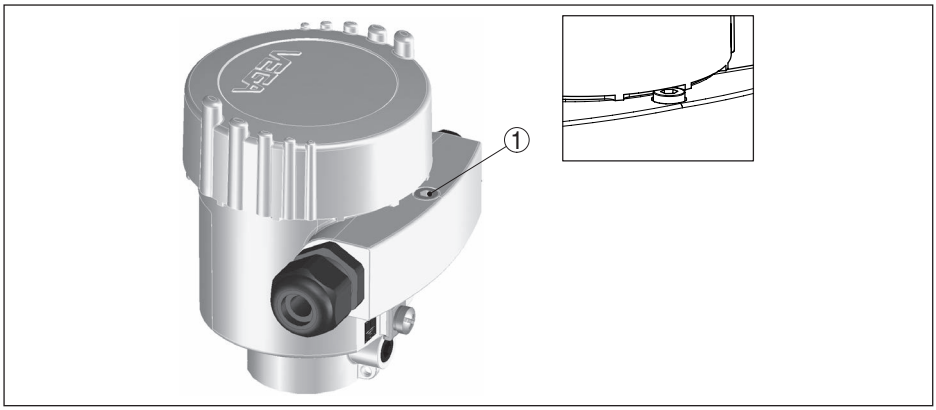


1 *Label: Type and size of the thread ½-14 NPT or M20 x 1.5*
2 *Label: Type and size of the thread ½-14 NPT or M20 x 1.5*
3 *Screw plug*

Mounting

Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided
- Vessel installations and probable flow must be taken into account
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label
- Protect the lid against unauthorized opening by unscrewing the locking screw up to the stop.



1 Locking screw of the lid

- 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

8 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
- 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 VEGAMIP T61, R61, R62
- Version with swivelling holder:
  – When using as instrument with EPL Ga/Gb in the versions with swivelling holder, keep in mind that the protection class IP 67 is ensured when orientating the antenna by swivelling or after screwing the flange on.
- Version with rinsing connection:
  – For the VEGAMIP T61, R61, R62 in the version with rinsing connection, please make sure when using as instrument with EPL Ga/Gb that protection IP 67 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 67.
- The VEGAMIP T61, R61, R62 must be installed in such a way that sensor (antenna) does not touch the vessel wall. Especially the inner tank structure, the flow conditions in the tank and the antenna length must be taken into account.
- 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

9 Instructions for zone 20 applications

In hazardous areas, the instrument should only operated under atmospheric conditions:

- Temperature: -20 … +60 °C.
- Pressure: 80 … 110 kPa (0.8 … 1.1 bar)
- Air with normal oxygen content, normally 21 %

If there are no explosive mixtures or supplementary measures, e.g. according to ISO/EN 1127-1, then the instruments can be also operated according to the manufacturer specifications outside atmospheric conditions.

Process fittings between an area requiring EPL Da and less endangered areas must show a tightness in accordance with protection rating IP 67 acc. to IEC/EN 60529.

The operator must ensure that the medium temperature in the EPL Da range within the process vessel is not higher than 80 % of the self-ignition temperature of the concerned medium (in °C) and does not exceed the max. permissible flange temperature depending on the temperature class. The parts of the capacitive probe which during operation are in contact with flammable products, must be integrated in the periodic overpressure test of the plant.

When used as EPL Da/Db instrument, a suitable overvoltage arrester must be provided acc. to IEC/EN 60079-14 as protection against overvoltages.

10 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, e.g. acc. to IEC/EN 60079-14
- The intrinsically safe input and the intrinsically safe output circuits are ground-free. The voltage resistance against ground is min. 500 Veff.

11 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
- 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 (measurement loop identification 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 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

12 Electrical data

VEGAMIP MPT61(*).GX/DK****T*** Voltage supply: (terminals 1, 2) Power consumption Load current	U = 20 … 253 V AC, 50/60 Hz or U = 20 … 72 V DC 1.8 VA (AC), approx. 1.3 W (DC)
VEGAMIP MPR61(*).GX/DK****R***, MPR62(*).GX****R**** Voltage supply: (terminals 1, 2) Power consumption Relay circuit: Terminals 3, 4, 5 Terminals 6, 7, 8	U = 20 … 253 V AC, 50/60 Hz U = 20 … 72 V DC 1.8 VA (AC), approx. 1.3 W (DC) 253 V AC, 5 A 4 A, 30 V DC 0.2 A, 125 V DC
VEGAMIP MPT61(*).GX/DK****T***, MPT62(*).GX****T**** Voltage supply: (terminals 1, 2) Power consumption Transistor output: Terminals 4, 5	U = 20 … 55 V DC max. 1 W U_{Load} = 20 … 55 V DC I_{Load} ≤ 400 mA AC
Emitting/Receiver frequency Radiation power (normal operation) Radiation power (2-error analysis)	 P_{EIRP} = 0.1 DC P_{EIRP} = 2.7 DC

13 Thermal data

The following temperature tables are valid for all housing and electronics versions.

Permissible ambient temperatures

On the sensor: Device protection level (EPL) Da, Db	VEGAMIP MPT61(*).GX****T*** VEGAMIP MPR61(*).GX****R/T*** VEGAMIP MPR62(*).GX****R/T***	-40 … +130 °C
	VEGAMIP MPT61(*).GX/DKA***T*** VEGAMIP MPR61(*).GX/DKA***R/T*** VEGAMIP MPR62(*).GXA***R/T***	-40 … +80 °C
	VEGAMIP MPT61(*).GXF***T*** VEGAMIP MPR61(*).GXF***R/T*** VEGAMIP MPR62(*).GXF***R/T***	-40 … +80 °C
	High temperature version VEGAMIP MPT61(*).GX****T*** VEGAMIP MPR61(*).GX****R/T*** VEGAMIP MPR62(*).GX****R/T***	-170 … +250 °C
	Ceramic version VEGAMIP MPT61(*).GX****T*** VEGAMIP MPR61(*).GX****R/T*** VEGAMIP MPR62(*).GX****R/T***	-170 … +450 °C

Surface temperature increase

On the sensor: Device protection level (EPL) Da, Db	VEGAMIP MPT61(*).GX/DK****T*** VEGAMIP MPR61(*).GX/DK****R/T*** VEGAMIP MPR62(*).GX****R/T***	Process temperature +3 K
On the electronics housing: Device protection level (EPL) Da, Db, Dc	VEGAMIP MPT61(*).GX/DKA***T*** VEGAMIP MPR61(*).GX/DKA***R/T*** VEGAMIP MPR62(*).GXA***R/T***	Limited to +102 °C by temperature link

Max. surface temperature on the sensor/antenna

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.

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