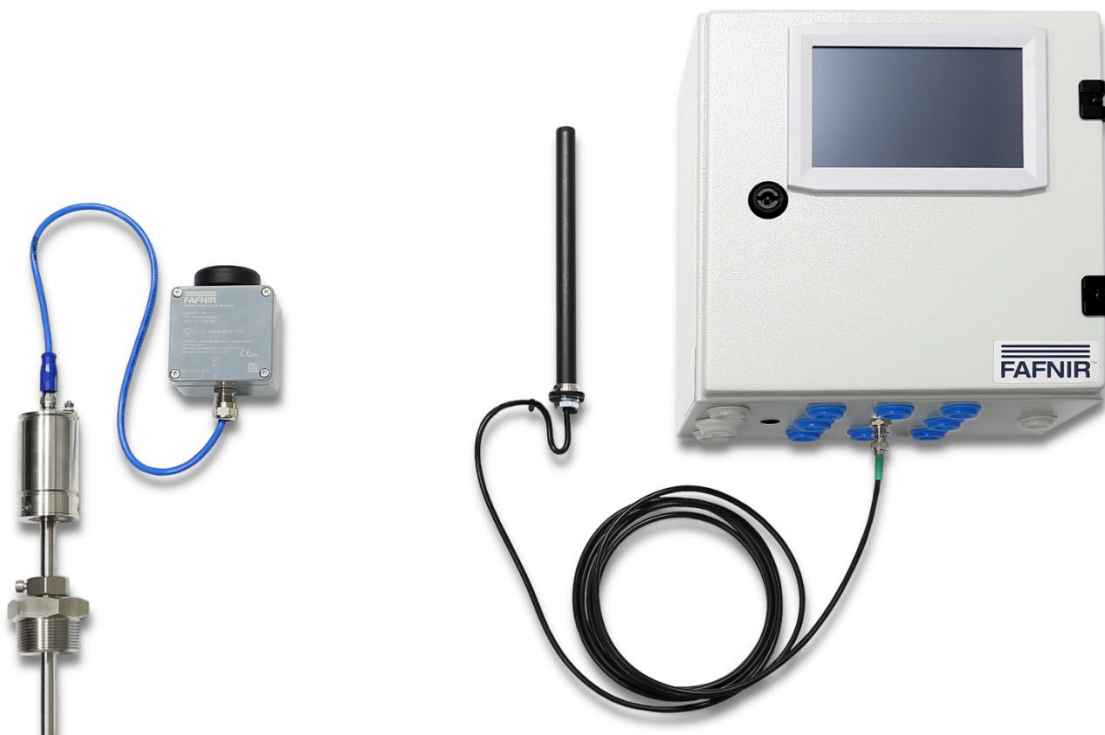


# VISY-X

## VISY-RF V4 Wireless System

(en)



Art. No.	Version	Edition
<b>350394</b>	<b>1</b>	<b>2025-01</b>

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# 1 Introduction

The **VISY-X system** is a data collection system for liquid storage tanks and environmental sensors. It consists of various sensors and the evaluation unit installed inside a building. The VISY-Command unit evaluates the measured data from the VISY-Sensors and transmits it to a higher-level system (e.g. POS) upon request.

In most cases, the VISY sensors are electrically connected to the VISY-Command evaluation unit via cables.

The **VISY-RF radio system** can be selected if there are no free cable ducts available between the sensors and the evaluation unit. For this purpose, the VISY sensors are connected to the VISY-RFT transmitters. The measured values from the sensors are then transmitted wirelessly to the VISY-Command RF evaluation unit. VISY-Command RF is a VISY-Command with VISY-RFR receiver.

## 1.1 In this manual ...

... you will be guided through the installation and commissioning of the VISY-RF V4 radio system. During installation, the VISY-Command RF evaluation unit is configured using a PC/notebook and the VISY-Setup software, see:



Technical documentation VISY-Setup V4, art. no. 207158

## 1.1 Replacement of an existing VISY-RF III system

Older VISY-RF III systems can be replaced with the VISY-RF V4 system without any loss of functionality, see:



Technical documentation VISY-RF V4 Upgrade, Art. No. 207216

## 1.2 Requirements for technicians

All parts of the VISY-RF wireless system should be installed only by trained service technicians.

## 1.3 Recommended tools

- Notebook with VISY-Setup
- RS-232 communication cable

## 1.4 Safety Instructions



*Useful information in this guide you should observe, appear in italics and are identified by this symbol.*



*Not observing these safety instructions result in the risk of accident or damages to the system.*

Observe and follow all product safety instructions and operating instructions. The following safety precautions must be observed to reduce the risk of injury, electric shocks, fire or damage to the equipment:



*VISY-RF radio system should only be used together with FAFNIR components.*



*The VISY-RFT transmitter is approved for use in potentially explosive atmospheres.*



*Before commissioning the VISY-RF V4 radio system, set the radio frequency permitted in your country using the DIP switches on the VISY-RFR receiver.*



*To ensure explosion protection, only original FAFNIR batteries may be used for the VISY-RFT transmitters!*



*Make sure that the VISY-RFT transmitter inside a manhole is never submerged in water.*



*The VISY-Command (RF) must be installed outside potentially explosive areas, e. g. inside buildings.*



*After opening the housing door of the VISY-Command there is a risk of electric shock on touching conductive parts.*



*When installing the outdoor antenna, all applicable rules and regulations regarding lightning and surge voltage protection must be observed!*

## 2 Components

*Components of the VISY-RF V4 radio system:*

- VISY Probe/Sensors (VISY-Stick, VISY-Stick Sump, ...)
- VISY-RFT installation kit (Art. No. 910040)
- VISY-RFT V4 transmitter (art. no. 900258) including battery
- VISY-RFR V4 antenna with 3 m antenna cable (art. no. 900259)
- VISY-Command RF with built-in VISY-RFR V4 receiver

*Components for replacing a VISY-RF III radio system with the VISY-RF V4 system:*

- VISY-RFT V4 transmitter (art. no. 900258) including battery
- VISY-RFR V4 antenna with 3 m antenna cable (art. no. 900259)
- VISY-RFR V4 receiver (art. no. 908903)
- VISY-RFR V4 supply unit (art. no. 901411)

*Extensions for the VISY-RF radio system:*

- FAFNIR cable extension for VISY-RFT transmitters, 100 m (art. no. 904110)
- FAFNIR IP68 cable connector (art. no. 910035)
- FAFNIR antenna cable extension, low attenuation, 25m (art. no. 900260)

*Spare parts for the VISY-RF radio system:*

- Intrinsically safe battery (art. no. 900095)

The **VISY-RFT transmitter** is powered by an intrinsically safe battery.

The data from the VISY sensors is sent by the VISY-RFT transmitter to the **VISY-RFR receiver** and is forwarded to the Interface VI-... . The VISY-RFR receiver is powered by the VISY-Command RF.

For installation of the VISY sensors and the VISY Command RF see:



Technical Documentation VISY-Stick/Reed, art. no. 207194



Technical Documentation VISY-Command, art. no. 207184



Technical Documentation VISY-Setup, art. no. 207158

## 2.1 Structure of the VISY-RFT V4 transmitter



Figure 1: VISY-RFT V4 transmitter with cover removed



**The silica gel belongs to the VISY-RFT transmitter and must be placed back into the housing of the transmitter during assembly.**

## 2.2 Structure of the VISY-RFR V4 receiver

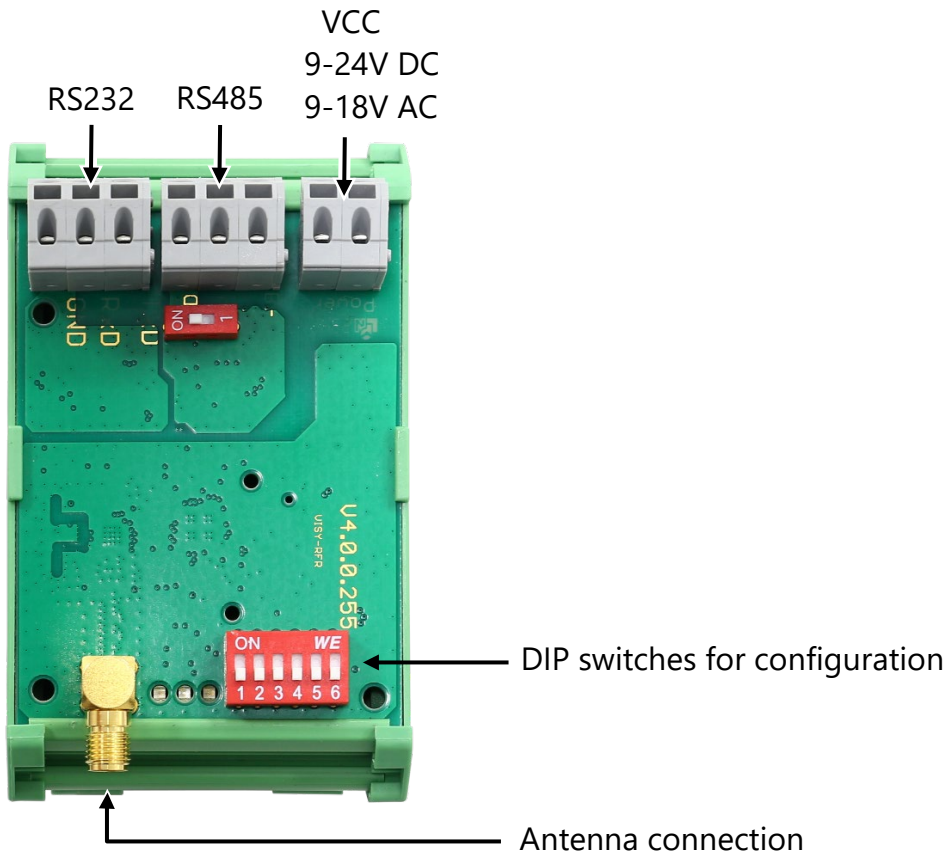


Figure 2: VISY-RFR V4 receiver

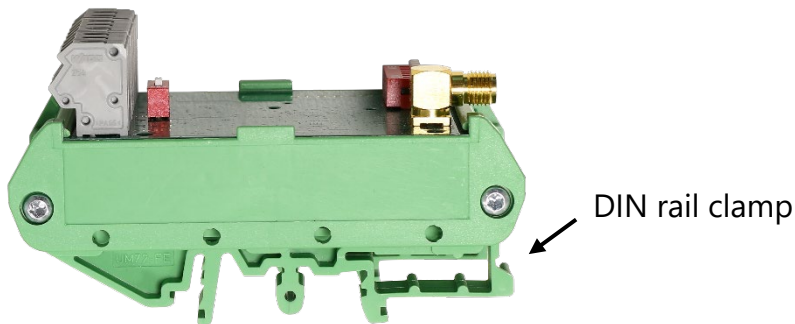


Figure 3: VISY-RFR V4 receiver, DIN mounting rail



## 2.1 Structure of the VISY-Command RF with VISY-RFR V4 receiver

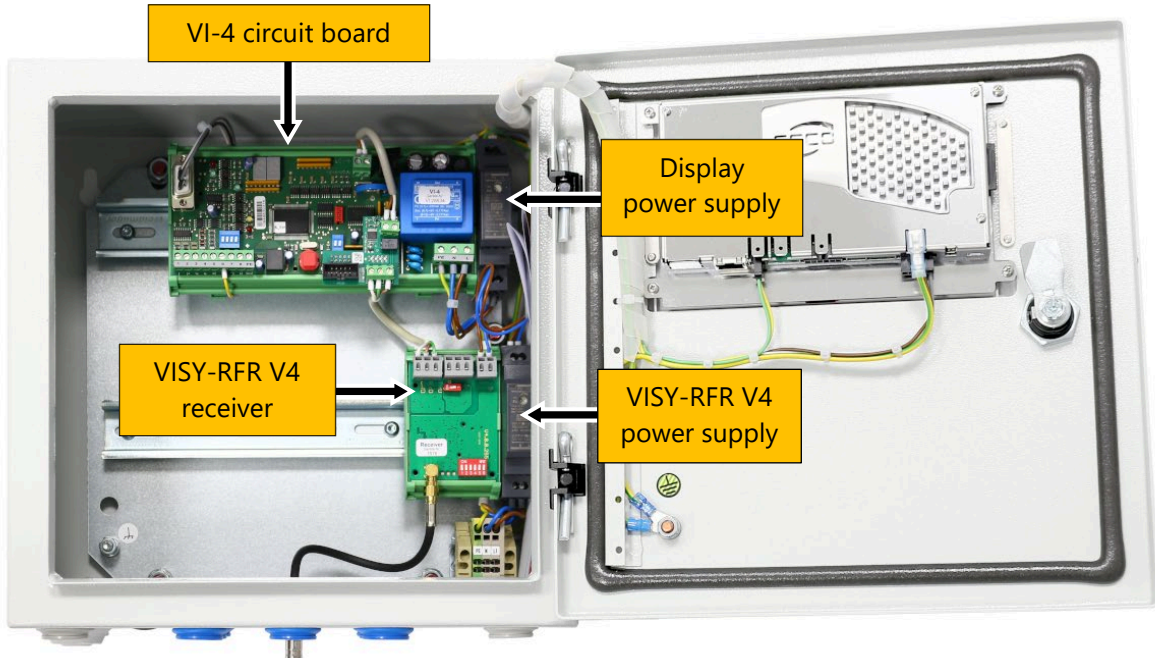


Figure 4: VISY-Command RF

### 3 Installation of the VISY-RF radio system

#### 3.1 General installation diagram

A typical VISY-RF installation is shown in the following figure.

The VISY-Stick sensor (1) is mounted in the manhole of the tank and is connected to the VISY-RFT transmitter (2). The transmitter generates radio signals, represented in the figures as semicircles. These radio signals are received by the antenna (3) and transmitted to the VISY-Command RF (5) via the antenna cable (4).

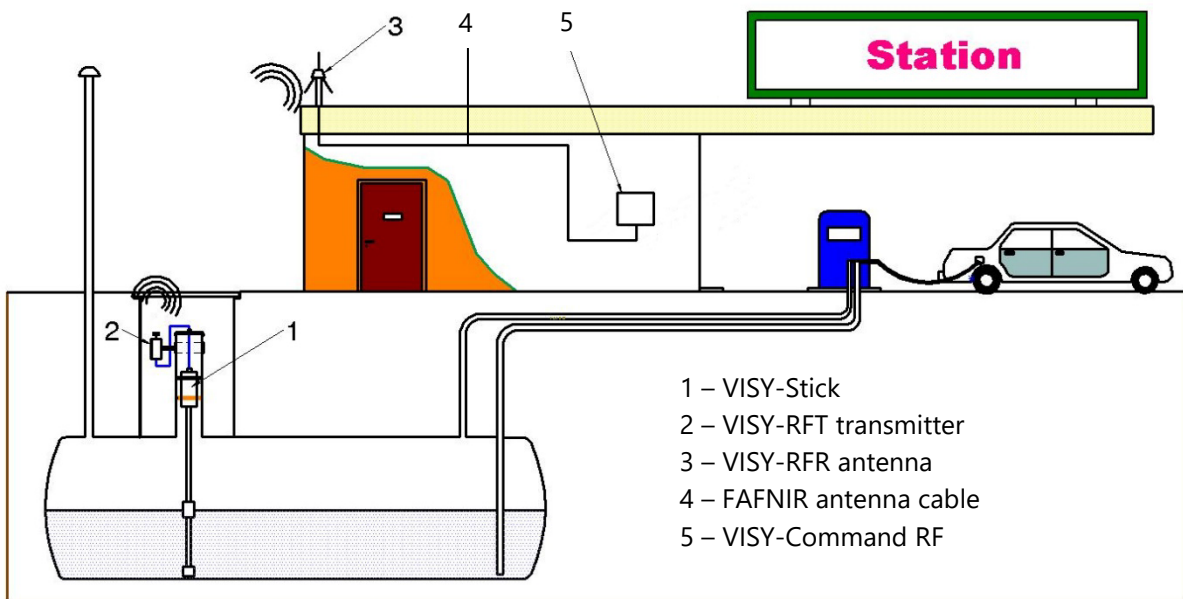


Figure 5: Typical installation of a VISY-RF radio system



*For installation, the best position of the transmitting and receiving antennas with the highest possible reception field strength should be determined!*

## 3.2 Installation of the VISY-RFR V4 receiving antenna



Figure 6: VISY-RFR V4 receiving antenna (rod antenna)

The VISY-RFR V4 receiving antenna (art. no. 900259) is supplied with a mounting bracket and a 3 m long antenna cable.

- ➔ Connect the receiving antenna to the VISY-Command
- ➔ The installation of the receiving antenna should be done after determining the best reception

To extend the antenna cable, only the antenna cable extension available from FAFNIR should be used (item no. 900260).

If the reception is good enough, the VISY-RFR V4 receiving antenna can be mounted near the VISY-Command RF (see Figure 8).



*Observe local installation regulations for outdoor antennas!*



*The receiving antenna must be positioned so that **all** transmitters can be received as optimally as possible. For this purpose, the radio signal quality can be checked, see chapter 3.8 Checking the radio signal quality.*



*Reception quality can be significantly reduced if the line of sight between manholes and receiving antenna is blocked (e.g. by vehicles) or if the manholes are covered.*

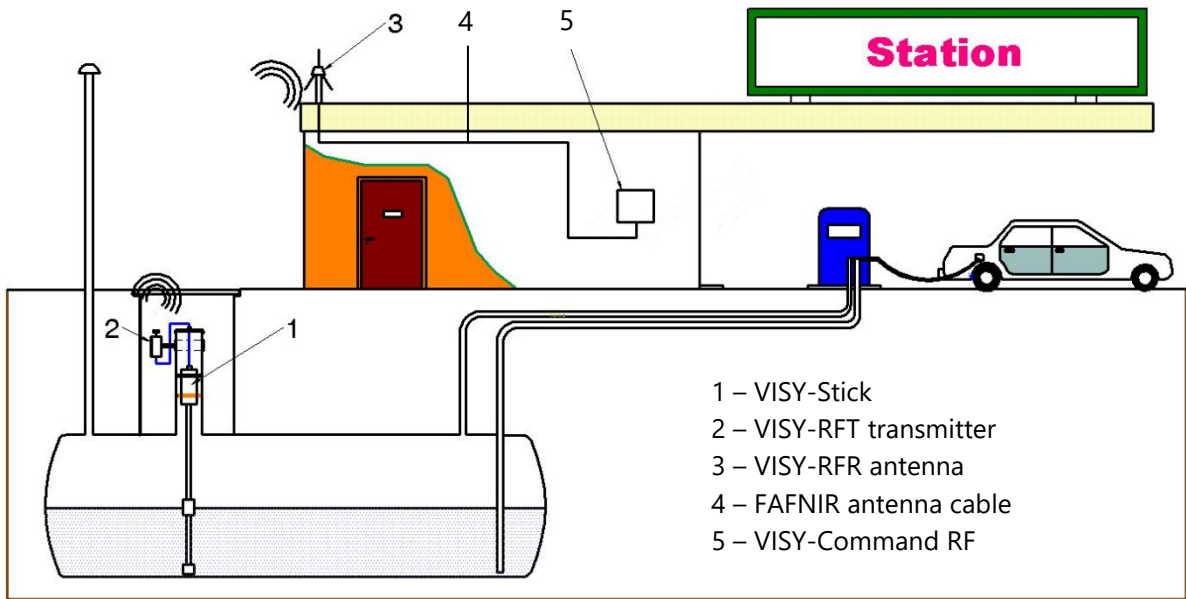


Figure 7: Receiving antenna with FAFNIR antenna cable extension

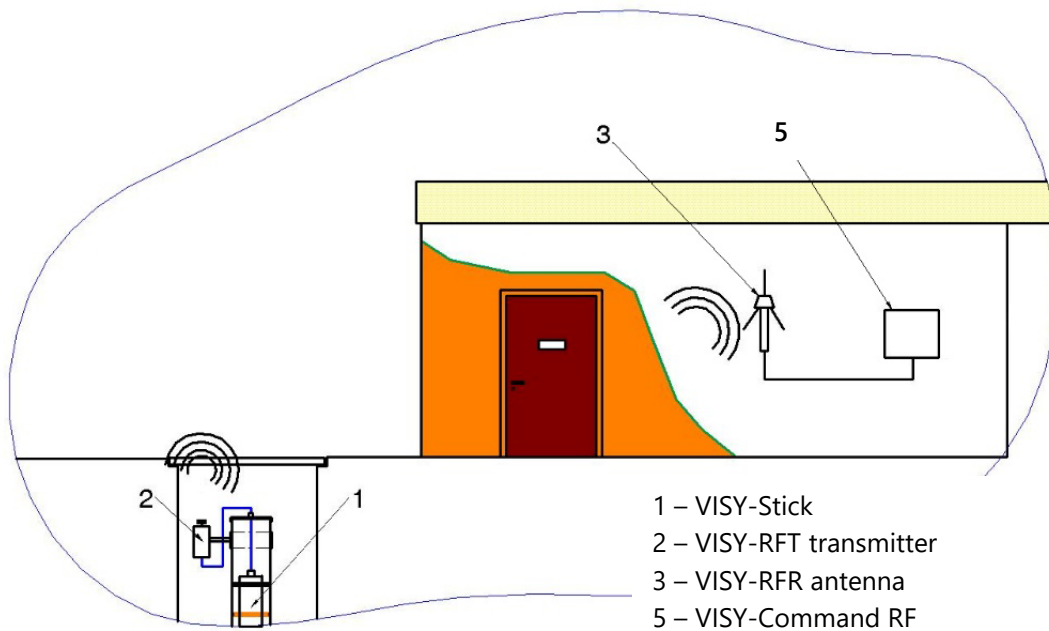


Figure 8: Receiving antenna with standard cable

If the reception is not sufficient, the antenna should be mounted as close as possible to the VISY-RFT transmitters, as shown in the following figure.

To extend the antenna cable (4), only the antenna cable extension available from FAFNIR (Art. No. 900260) must be used.

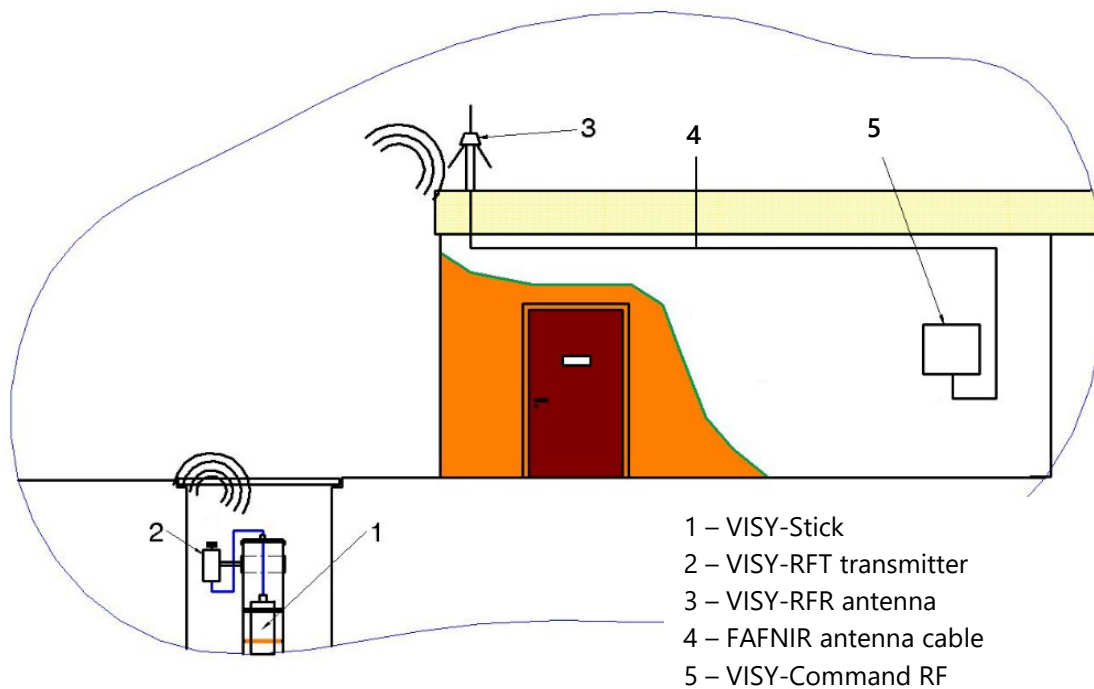


Figure 9: Receiving antenna with FAFNIR antenna cable extension

### 3.3 Configuring the VISY-Command RF




- ➔ Connect the VISY-Command to the PC/notebook via the RS232 interface of the VI-4 board
- ➔ Start the VISY-Setup software on the PC/notebook to configure the VISY-Command
- ➔ For radio transmission, select the data protocol for VISY-Stick communication "Multi Probe 1200 bps" in the menu "Control Unit -> Advanced settings"

For details on the configuration see:

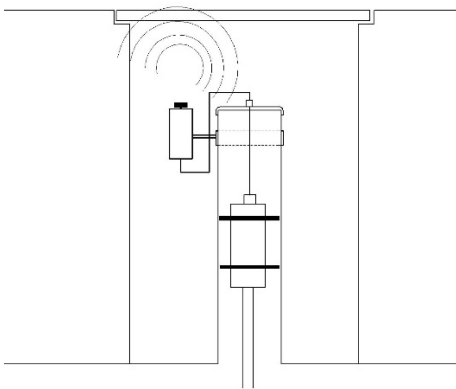


Technical Documentation VISY-Setup, art. no. 207158

### 3.4 Radio transmission in various manholes

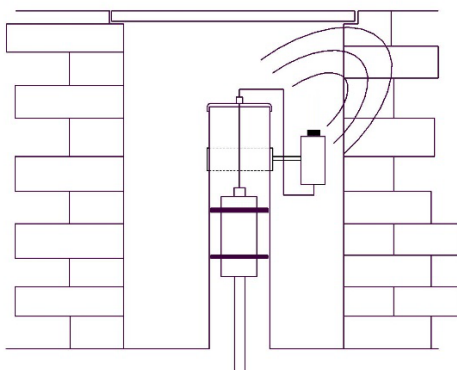
-  *The orientation and position of the transmitters can affect the quality of the radio transmission.*
-  *The radio path between the transmitting and receiving antennas should not be interrupted by objects to ensure barrier-free transmission.*
-  *Reception conditions can be significantly reduced if the manhole cover is covered by ice and snow.*

To mount the VISY-RFT transmitter, select a position in the manhole where the shielding of the radio transmission is as low as possible. The typical propagation of radio waves from different manholes is shown in the following 5 figures.



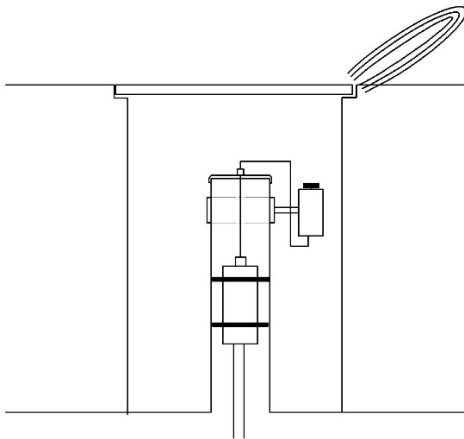
Radio transmission with minimal attenuation

Figure 10: Manhole with plastic cover



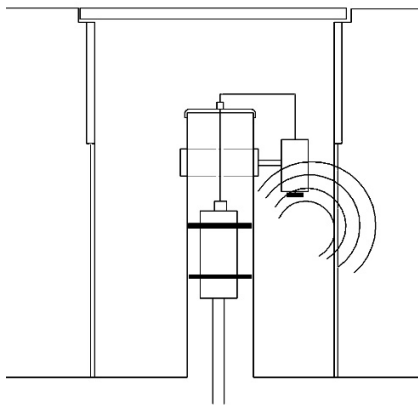
Radio transmission with significant attenuation

Figure 11: Walled manhole with metal cover



Strong shielding (Faraday cage):  
only a small part of the radio signal  
finds passage if a slot is present

Figure 12: Welded (metal) manhole with metal cover

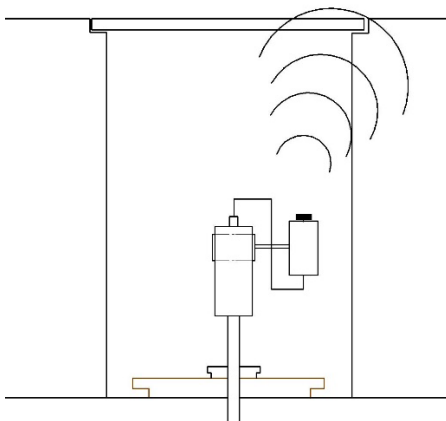


Radio transmission with average value  
attenuation: Radio signal passes through  
the plastic pipe underneath the metal  
ring

Figure 13: Manhole (plastic pipe) with metal cover and metal ring



*The installation of the VISY-RFT transmitter in connection with the VISY-Stick with screw-in body corresponds analogously Figure 10 until Figure 13.*



Radio transmission with minimal attenuation

Figure 14: Manhole with plastic cover

### 3.5 Installation of the transmitter

- The VISY-RFT transmitter should be mounted as high as possible in the man-hole and with the antenna pointing towards the manhole cover.
- The connection cable of the VISY-RFT transmitter is equipped with an M12 connector for connection to the VISY-Stick sensor.
- When mounting the VISY-RFT transmitter on the VISY-Stick ...  
 ... with screw-in body, the M12 connector can be plugged directly onto the probe. Then tighten the union nut of the M12 coupler by hand and finally secure it with a wrench by turning it 180°.  
 ... with riser (pipe installation) there must be a cable duct in the cap of the pipe cover. The connection cable can be disconnected from the transmitter and fed through the cable gland of the pipe cover.
- It is possible to attach the VISY-RFT transmitter to a pipe using the VISY-RFT installation kit (art. no. 910040).

➔ Mount the transmitter and connect the cable plug to the VISY-Stick probe

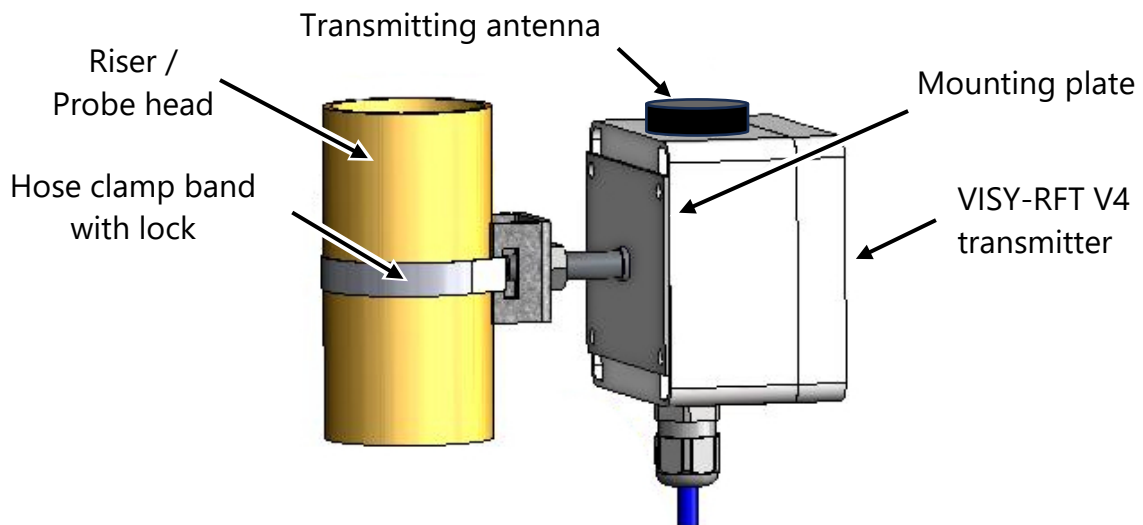


Figure 15: VISY-RFT installation kit



*The drying agent (silica gel) must be inside the housing to prevent corrosion.*




*Make sure that no water can penetrate the VISY-RFT transmitter!*



### 3.6 Configuring the radio transmission with the receiver

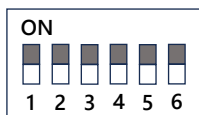
➔ Open the cover of the VISY-Command with the housing key

 *After opening the housing door of the VISY-Command there is a risk of electric shock on touching conductive parts.*

➔ Configure the radio transmission using the DIP switches of the VISY-RFR V4 receiver, see Figure 2: VISY-RFR V4 receiver.

➔ Use the **DIP switches S1 + S2** to set the desired radio frequency permitted in your country. The choices are 868 MHz, 915 MHz, 922 MHz.

➔ Two transmission intervals can be set for the transmitter operation. Use **DIP switch S3** to set the desired interval. The interval is applied to all transmitters.



Example: DIP switch = white, S1=OFF, S2=OFF, S3=OFF, S4=OFF

Function: Radio frequency 868 Mhz, radio interval 300s, no new transmitters

S1	S2	S3	S4	S5	S6	Function
OFF	OFF	-	-	-	-	Radio frequency 868 MHz
OFF	ON	-	-	-	-	Radio frequency 915 MHz
ON	OFF	-	-	-	-	Radio frequency 922 MHz
ON	ON	-	-	-	-	Not defined
-	-	ON	-	-	-	Radio interval 60s (shorter battery life of the transmitters)
-	-	OFF	-	-	-	Radio interval 300s (longer battery life of the transmitter)
-	-	-	OFF	-	-	No new senders are accepted by the receiver
-	-	-	ON	-	-	The receiver accepts new transmitters for 60 minutes from the time it is switched to the "ON" position.

➔ Set the **DIP switch S4** for the pairing mode to the "ON" position. The pairing mode is then active for 60 minutes or can be manually switched off again by setting it to the "OFF" position.

➔ Close the cover of the VISY-Command with the housing key.

➔ Pair the transmitter with the receiver, see chapter "Transmitter-Receiver Pairing".

### 3.7 Transmitter-Receiver Pairing

For the wireless transmission of data from the transmitter to the receiver, the devices must be paired:

- ➔ Open the cover of the VISY-RFT V4 transmitter
- ➔ Put the silica gel aside for final assembly
- ➔ Connect the battery plug to the corresponding contacts (see the following figure)
- ➔ The pairing mode (see chapter "Configuration of the radio transmission with the receiver") is active for 60 minutes. To pair the devices, press the **button** in the VISY-RFT V4 transmitter once.

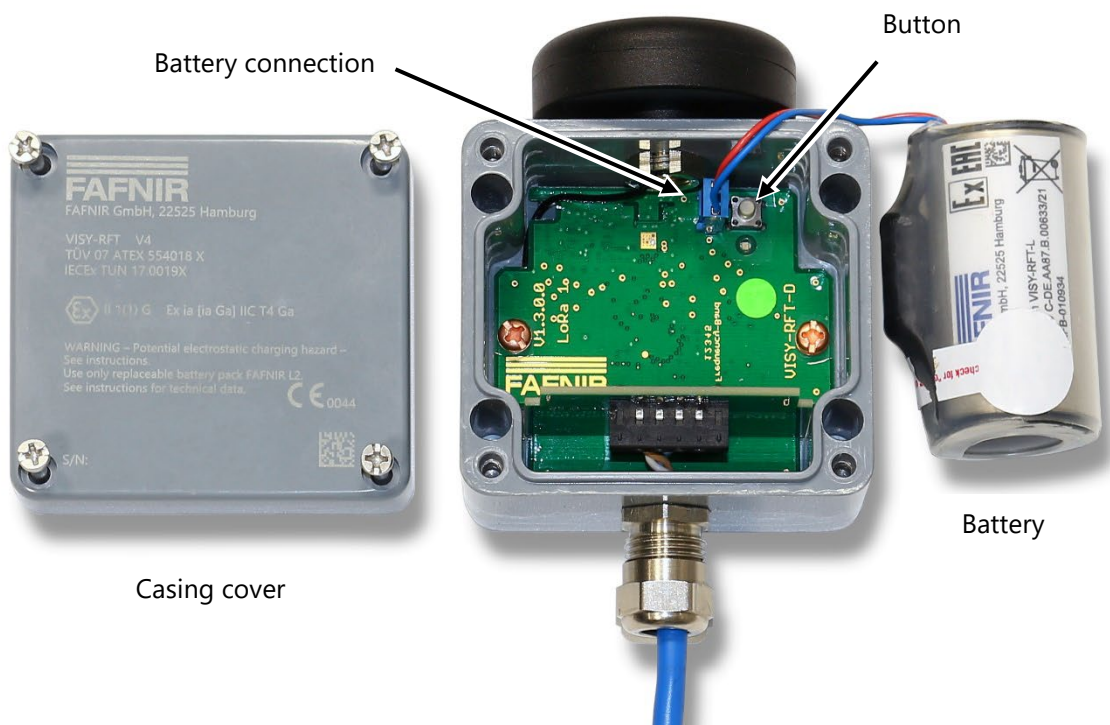


Figure 16: VISY-RFT V4 transmitter; interior view

- ➔ As soon as the receiver has registered the sender, the communication is established.
- ➔ **After configuration, place the silica gel back into the housing of the VISY-RFT transmitter.**
- ➔ **Close the casing cover**

### 3.8 Checking the radio signal quality

The field strength of the transmitters can be checked with the VISY-Setup software by reading the VISY-Command RF measurement values, see the following figure:

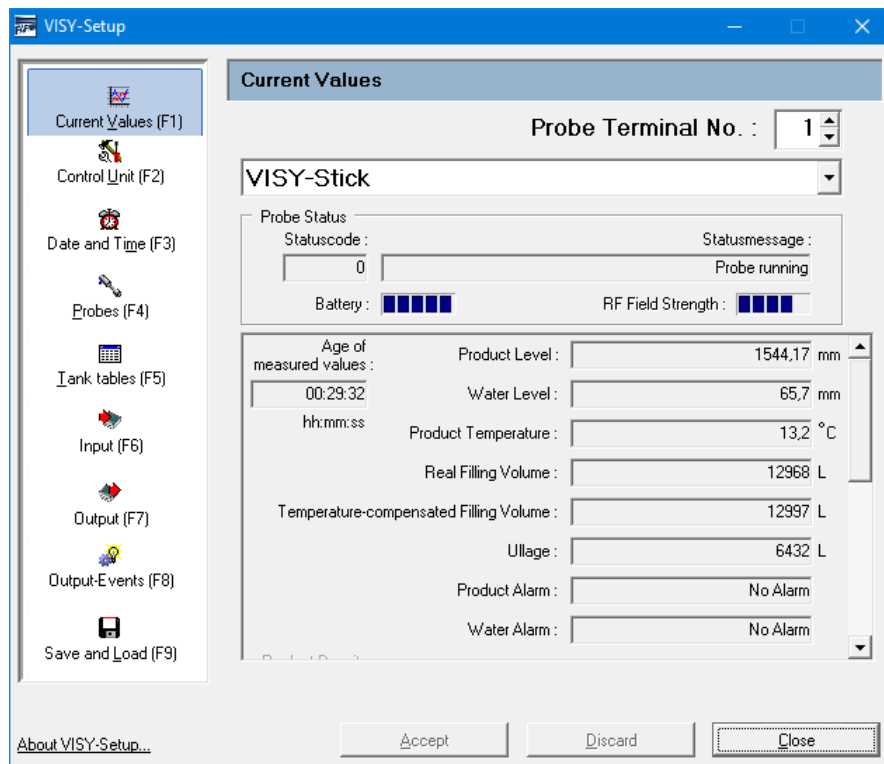



Figure 17: "Current Values (F1)" menu in VISY-Setup showing "Battery", "RF Field Strength" and "Age of measured values".

To check the reception field strength, the transmission interval should be set to 1 minute, see chapter "Configuration of the radio transmission with the receiver".

 *If the reception field strength is represented by at least one bar on the display, the system is working properly.*

If no sufficient field strength is detected, the locations of the VISY-RFT transmitting antenna and the VISY-RFR receiving antenna are too far apart or too heavily shielded. Then an installation location outside the building and/or the manhole should be chosen, see the following figure:

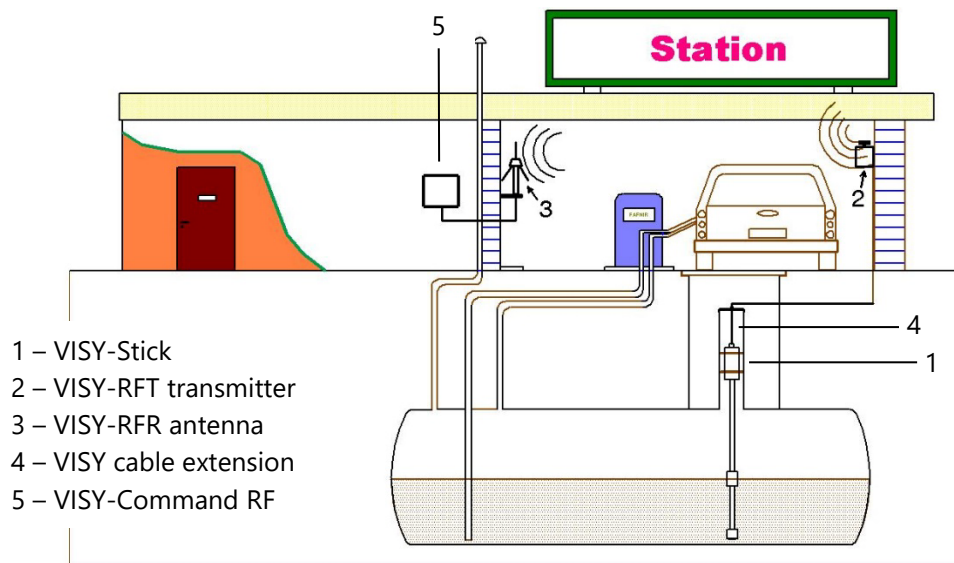


Figure 18: Structure of the VISY-RFT transmitter

To install the VISY-RFT transmitter (2) outside the manhole, a cable extension (art. no. 904110) of the connection cable (4) with an IP68 cable connection (art. no. 910035) is required, see the following figure:



Figure 19: FAFNIR IP68 cable connector (4 pole)



*Make sure that no water can penetrate into the VISY-RFT transmitter at the installation location!*

Using the methods described, a satisfactory level of transmission can be achieved in most cases.

### 3.9 Final assembly

When the data transfer of all transmitters has been checked, all components of the VISY-RF radio system must be fixed in their final positions.

## 4 General notes and troubleshooting

### 4.1 Radio signal losses

Radio signals are influenced by objects located in the propagation area. This must be taken into account when choosing mounting points. Whenever a radio signal encounters an object, part of the signal power is absorbed or reflected by the object and the useful signal is weakened. This attenuation can vary with the type of object penetrated by the radio signal. Losses are significantly increased by objects that have a high metal content, for example.



*Reception quality can be significantly reduced if the line of sight between manholes and receiving antenna is blocked (e.g. by vehicles) or if the manholes are covered.*

- Price towers, dispensers, and other objects common to filling stations, can lead to losses of 5 – 15 dB, depending on object size and material.
- Walls can cause losses of 10 – 30 dB, depending on construction.
- Bushes, trees or earth can be responsible for losses of 10 – 30 dB.

### 4.2 Radio line of sight

Radio line of sight refers to the clear, unimpeded signal path between transmitter and receiver. For the VISY-RF wireless system, the receiving antenna should be placed in direct line of sight to the manhole.

### 4.3 Interference radiation

Radio interference distorts or completely overlaps the received signal with the effect that it becomes impossible to be evaluated. Interference radiation can be caused by devices nearby, e.g. transmitters on the same frequency.

### 4.4 Equipment location

The VISY-RFT transmitters should be mounted as high as possible in the manhole.

The receiving antenna should be installed in a position with a direct line of sight to the manholes to allow unhindered transmission of the radio signal. If possible, the antenna should be mounted in a corner to exploit the parabolic effect and improve reception.

## 4.5 Error codes and troubleshooting tips

The following status codes can be displayed as errors with VISY-Setup, see Figure 17; the same status codes are displayed in VISY-Command RF with two 7-segment LEDs:

Status code	Description	Suggested solution
1-7	Problem with the VISY sensor	See technical documentation "VISY-Command"
8	Bad connections between the VISY-RFT and the VISY sensor	Check cable connections (M12 couplers)
9	No measuring sensor connected to VISY-RFT transmitter	Check the connections and the functionality of the VISY sensors
10	No data available	Check the connections inside VISY-Command RF between VISY-RFR and VI-Board
11	Communication fault	Check all components
13	Waiting for first data transfer	If the error is displayed permanently, check the entire installation and configuration.

Table 1: List of error codes

## 4.6 Battery

The status of the battery can be checked using the VISY-Setup software (see Figure 17). Five bars indicate that the battery is fully charged. Even if only one bar is displayed for the battery, the battery should still have sufficient charge to last a few weeks. However, the next battery change should be scheduled immediately to prevent failure of the VISY-RFT transmitter. If no bars are displayed, the battery has completely expired.



*Battery performance is temperature-dependent. The battery operates only in the temperature range of -40 to +60 °C.*



*The battery may be replaced in potentially explosive areas (Zone 1).*



*Only original FAFNIR batteries (item no. 900095) may be used to ensure explosion protection!*



*Separate collection:  
Batteries must be disposed of as hazardous waste.*



## 5 Technical Data

### 5.1 General data

Frequencies	868 MHz 915 MHz 922 MHz
Transmission distance (line of sight)	max. 250 m
Radio power output	< 25 mW

### 5.2 VISY-RFT V4 transmitter

Antenna	internal
Battery pack	Lithium
Battery capacity	19 Ah
Expected battery life at 20 °C ambient temperature and average tank filling of 30 minutes/day	
	4 years (5 minutes mode)
	2 years (1 minute mode)
Battery article number	900095
Housing	[80 x 82 x 55] mm
Protection class	IP67
Operating temperature range	-40 °C ... +60 °C

### 5.3 VISY-Command RF with VISY-RFR V4 receiver

Antenna connector	1 x BNC
Supply voltage	230 V ± 10 %; 50 Hz; 20 VA
Operating temperature range	-20 °C ... +70 °C (without display) 0 °C ... +60 °C (with display)



## Translation

### (1) **EU-Type Examination Certificate**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 2014/34/EU**

(3) **Certificate Number** TÜV 07 ATEX 554018 X **Issue:** 01

(4) for the product: Radio Transmitter type VISY-RFT

(5) of the manufacturer: **FAFNIR GmbH**

(6) Address: Schnackenburgallee 149 c  
22525 Hamburg  
Germany

Order number: 8003057266

Date of issue: See date of signature

(7) The design of this product and any acceptable variation thereto are specified in the schedule to this EU-Type Examination Certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH, Notified Body No. 0044, in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential ATEX Assessment Report No. 23 203346077.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

**EN IEC 60079-0:2018/AC:2020-02**


**EN 60079-11:2012**

except in respect of those requirements listed at item 18 of the schedule.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions for Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design, and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the product shall include the following:

 II 1(1) G Ex ia [ia Ga] IIC T4 Ga

TÜV NORD CERT GmbH, Am TÜV 1, 45307 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body

 Digital unterschrieben  
von Roder Christian  
Datum: 2023.11.16  
11:52:19 +01'00'

Hanover office, Am TÜV 1, 30519 Hannover, Tel. +49 511 998-61455, Fax +49 511 998-61590



(13) **SCHEDULE**

(14) **EU-Type Examination Certificate TÜV 07 ATEX 554018 X Issue 01**

(15) Description of product

The radio transmitter is an intrinsically safe apparatus for transmitting sensor data from potentially explosive atmospheres. The radio transmitter is operated with a replaceable battery pack.

Type code and Marking:

VISY-RFT	Radio Frequency Transmitter	Ex ia [ia Ga] IIC T4 Ga
L2	Replaceable Batterie Pack	Use only on VISY-RFT

Electrical data:

Auxiliary power	Nominal voltage 3.6 V from internal battery pack type L2 from FAFNIR GmbH
-----------------	--

Sensor circuit  
(terminals +, A, B, -)

in type of protection intrinsic safety Ex ia IIC/IIB  
Maximum values:

$U_o = 7.8 \text{ V}$   
 $I_o = 59 \text{ mA}$   
 $P_o = 98 \text{ mW}$   
 Characteristic line: linear  
 $C_i$  negligibly small  
 $L_i$  negligibly small

The maximum permissible values for the external inductance ( $L_o$ ) and capacitance ( $C_o$ ) shall be taken from the following table:

	Ex ia IIC		Ex ia IIB	
	$L_o$	10 mH	5 mH	50 mH
$C_o$	0.78 $\mu\text{F}$	1.0 $\mu\text{F}$	4.6 $\mu\text{F}$	6.1 $\mu\text{F}$

The aforementioned maximum values of  $L_o$  and  $C_o$  consider the coincidental appearance of capacitance and inductance with the intention to allow the use of long connecting cables.

Permissible ambient temperature range:  
-40 °C ... +60 °C

(16) Drawings and documents are listed in the ATEX Assessment Report No. 23 203 346077

(17) Specific Conditions for Use

The radio transmitter is built in a plastic enclosure. The risk of ignition by static electricity due to friction on the enclosure is to be avoided. The equipment shall be cleaned only with damp or antistatic cloth.

(18) Essential Health and Safety Requirements

no additional ones

- End of EU-Type Examination Certificate -



## Instructions in accordance with directive 2014/34/EU

TÜV 07 ATEX 554018 X

### Radio Transmitter type VISY-RFT

Edition: 06.2023

#### I Range of application

The radio transmitter is an intrinsically safe apparatus for transmitting sensor data from potentially explosive atmospheres. The radio transmitter is operated with a replaceable battery pack.

#### II Standards

The radio transmitter is designed according to the following European standards

EN IEC 60079-0:2018/AC:2020-02	Equipment – General requirements
EN 60079-11:2012	Equipment protection by intrinsic safety "i"

#### III Instructions for safe ...

##### III.a ... use

The radio transmitter in type of protection intrinsic safety is suitable for use in potentially explosive atmospheres (Zone 0). The intrinsically safe sensor circuit may be led into Zone 0 and can be used for all gas groups (IIA, IIB and IIC).

The certificate applies to the device version VISY-RFT with the battery pack "L2".

##### III.b ... assembling and dismantling

To install or make changes to the radio transmitter, such as changing the battery unit, it is necessary to disassemble the upper enclosure part from the lower enclosure part. To do this, loosen the four screws on the upper enclosure part. After the work, the enclosure must be closed again with the four screws.

##### III.c ... installation

Special requirements inter alia EN 60079-14 or the local installation regulations must be observed.

The radio transmitter is suitable for wall mounting. To reach the mounting holes, the enclosure has to be dismantled. At the wiring (preferably blue cable) from the radio transmitter to the sensor, the permissible inductance and capacitance under point V must not be exceeded.

##### III.d ... adjustment

No Ex-relevant adjustments are necessary for the operation of the radio transmitter.

##### III.e ... putting into service

Before putting into service, all devices must be checked for correct connection and installation.

##### III.f ... maintenance (servicing and emergency repair)

The radio transmitter is generally maintenance-free. In the event of a defect, this must be returned to FAFNIR or one of its distributors.

Warning: The cleaning of the enclosure may only be carried out with a damp cloth.

There is consistency with the requirements for the dielectric strength between the intrinsic circuit and the chassis of the radio transmitter in accordance with EN 60079-11, section 6.3.13.

When replacing the battery pack, only FAFNIR battery packs (L2) may be used. Replacing the battery pack does not require the exclusion of an explosive atmosphere.



#### IV Equipment marking

- 1 Manufacturer: FAFNIR GmbH, 22525 Hamburg
- 2 Type designation: VISY-RFT
- 3 Certificate number: TÜV 07 ATEX 554018 X
- 4 Ex marking: II 1(1) G Ex ia [ia Ga] IIC T4 Ga
- 5 Warning marking: WARNING – Potential electrostatic charging hazard – See instructions
- 6 CE marking: 0044
- 7 Use of battery: Use only replaceable battery pack FAFNIR L2
- 8 Technical data: See instructions for technical data

In addition, the battery pack is marked as follows:

- 1 Manufacturer: FAFNIR GmbH, 22525 Hamburg
- 2 Type designation: L2
- 3 Use: Use only on VISY-RFT

#### V Technical data

Only FAFNIR battery pack L2 may be used as auxiliary energy for the radio transmitter!

The sensor circuit is designed in the type of protection "intrinsic safety" (ia), with a linear output characteristic. The initial values are:

Output voltage	$U_o \leq 7.8 \text{ V}$
Output current	$I_o \leq 59 \text{ mA}$
Output power	$P_o \leq 98 \text{ mW}$
Inner inductance	$L_i$ negligibly small
Inner capacitance	$C_i$ negligibly small

The permissible external inductance and capacitance are:

	IIB		IIC	
$L_o \leq$	10 mH	5 mH	50 mH	20 mH
$C_o \leq$	780 nF	1 $\mu\text{F}$	4.6 $\mu\text{F}$	6.1 $\mu\text{F}$

The maximum values of the pairs of values may simultaneously be used as concentrated capacity and concentrated inductance.

The permissible external inductance to resistance ratio is:

$$L_o/R_o \leq 309 \mu\text{H}/\Omega$$

The maximum temperature is:

$$\text{Ambient temperature: } T_a = -40 \text{ }^\circ\text{C} \dots +60 \text{ }^\circ\text{C}$$

The radio transmitter achieves a degree of protection provided by enclosure of:

$$\text{Degree of protection } \geq \text{IP66}$$

#### VI Special conditions of use

The radio transmitter is built in a plastic enclosure. The risk of ignition by static electricity due to friction on the enclosure is to be avoided. The equipment shall be cleaned only with damp or antistatic cloth.

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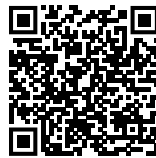
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FAFNIR GmbH  
Schnackenburgallee 149 c  
22525 Hamburg, Germany  
Tel.: +49/40/39 82 07-0  
E-mail: [info@fafnir.com](mailto:info@fafnir.com)  
Web: [www.fafnir.com](http://www.fafnir.com)

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