

VISY-X

VISY-Density



Version: 4
Edition: 2022-01
Art. no.: 350213

Table of contents

1	Introduction	1
1.1	In this manual	1
1.2	Safety instructions	2
2	VISY-Density and VISY-Density LPG	3
2.1	Design and construction	3
3	Installation	4
3.1	Scope of delivery.....	4
3.2	Assembly	5
3.2.1	VISY-Density with VISY-Stick Advanced.....	5
3.2.2	VISY-Density with VISY-Stick Flex.....	6
3.3	Installation.....	7
4	Retrofitting the VISY-Density module	8
4.1	Included parts of the VISY-Density extension set.....	8
4.2	Prerequisites	8
4.3	Removal of existing VISY-Stick level sensors	8
4.4	Mounting of the VISY-Density module	9
4.5	Configuration of the VISY-Stick level sensor	10
4.6	Installation of the VISY-Stick level sensor.....	11
5	Maintenance	12
5.1	Servicing.....	12
5.2	Return shipment.....	12
6	Technical Data	12
6.1	Technical information.....	12

© Copyright:

Reproduction and translation are permitted only with the written consent of the FAFNIR GmbH. The FAFNIR GmbH reserves the right to make product alterations without prior notice.

1 Introduction

The VISY-Density module is an extension of the level sensors VISY-Stick Advanced / Flex for measuring the product / sump or in the LPG version for measuring the product density of liquefied petroleum gas (LPG).

The VISY-X system (**V**olumen **I**nformation **S**ystem) provides highly precise and continuous level measurements for all commercially available fuels including LPG in up to 16 tanks. Simultaneously, the product temperature and water level can be measured.

The VISY-X system comprises:

- VISY-Command (central unit)
- VISY-Setup (software for configuring the VISY-Command)
- VISY-Stick (level sensors) as well as other environmental sensors

VISY-Stick Advanced level sensors can be installed in fuel tanks in two versions: via a screw-in unit with external thread or via the pipe installation (riser).

VISY-Stick Advanced LPG and VISY-Stick Flex can only be installed with a screw-in unit.

The level sensors have to be connected with the VISY-Command central unit installed inside the petrol station building. VISY-Command collects the data from the level sensors and transmits them to a higher-level system (e.g. POS) on request.

1.1 In this manual ...

... you will be guided through the installation, retrofitting and commissioning of the VISY-Density module.

Please also observe the additional instructions in following manuals:



Technical documentation VISY-Command VI-4, art. no. 207184



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

1.2 Safety instructions

The VISY-X system is optimised for use in petrol stations and can be used for all commercially available fuels and liquefied petroleum gas. It serves to measure and evaluate the filling levels in tanks. Use the system exclusively for this purpose. Observe and follow all product safety notes and operating instructions. The manufacturer accepts no liability for any form of damage resulting from improper use.

The level and environmental sensors have been developed, manufactured and tested in accordance with the latest good engineering practices and generally accepted safety standards. Nevertheless, hazards may arise from their use.

The safety instructions in this user guide are marked as follows:



If these safety instructions are not observed, it may result in the risk of accident or damage to the VISY-X system.



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

The following safety precautions must be observed to reduce risk of injury, electric shocks, fire or damage to the equipment:



Only use original parts. These comply with the technical requirements specified by the manufacturer.



Installation and maintenance of the VISY-X system and its components may only be carried out by trained service technicians.



Do not change or modify the system or add any equipment without the prior consent of the manufacturer.



For the installation and maintenance of the level sensors, the requirements of the Industrial Health and Safety Regulations and the Equipment Safety Regulations as well as generally accepted rules of engineering and these instructions must be observed.



Observe also the local safety and accident prevention regulations, which are not stated in these instructions.



All installation and maintenance work, with the exception of functional testing, must be carried out with the power disconnected.

2 VISY-Density and VISY-Density LPG

The VISY-Density module is available for use in fuel tanks as "VISY-Density" and for use in LPG tanks as "VISY-Density LPG".

2.1 Design and construction

VISY-Density and VISY-Density LPG differ in the module length and the measuring range (see chapter 6 Technical Data):

	VISY-Density	VISY-Density LPG
Measuring range [g / l]	710 ... 900	440 ... 660
Dimensions (DxH) [mm]	Ø 50 x 138.6	Ø 50 x 138.6

Depending on the position of the VISY-Density module on the probe tube, either the product density or the sump density is determined, see Figure 1.

With the VISY-Density LPG module, only the product density of liquid gas is determined. It should be fixed at the lower end of the probe tube.

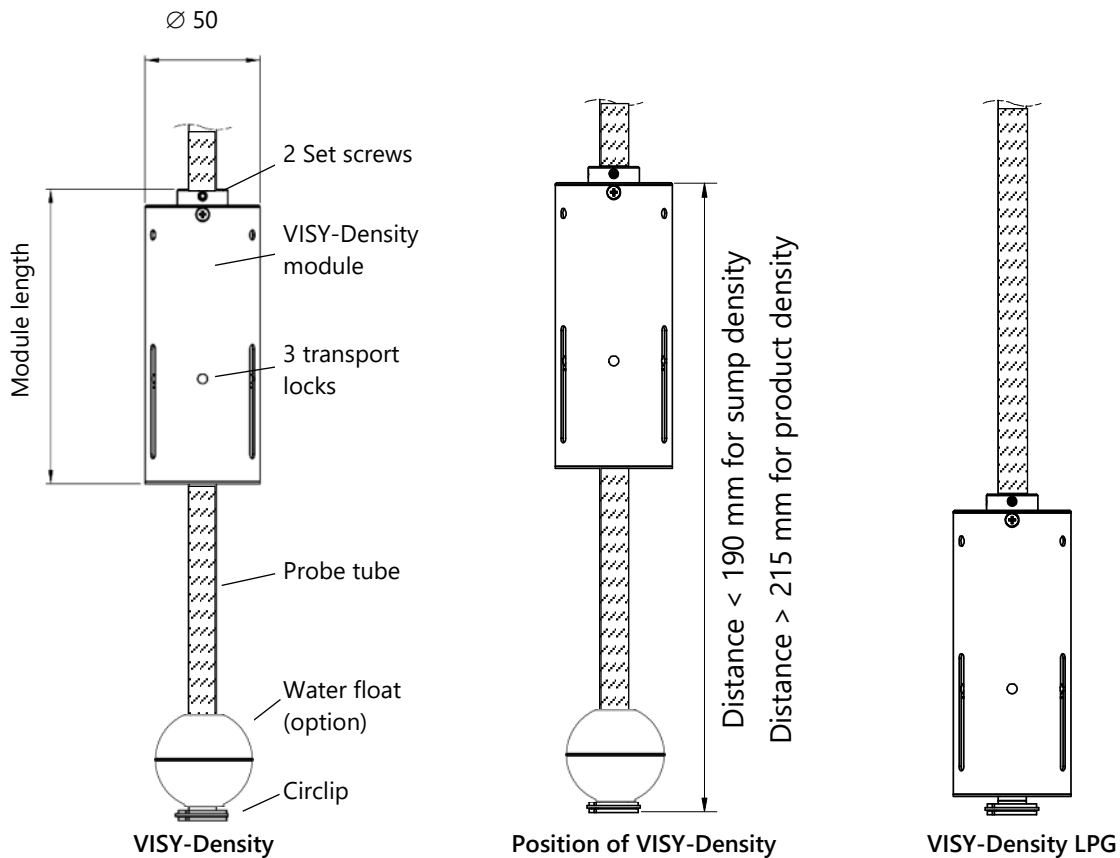


Figure 1: VISY-Density and VISY-Density LPG

3 Installation



All installation and maintenance work, with the exception of functional testing, must be carried out with the power disconnected.



The VISY-Density module is factory calibrated to an associated VISY-Stick level sensor. If the module is retrofitted, the calibration data of the level sensor must be updated, see chapter "Retrofitting".



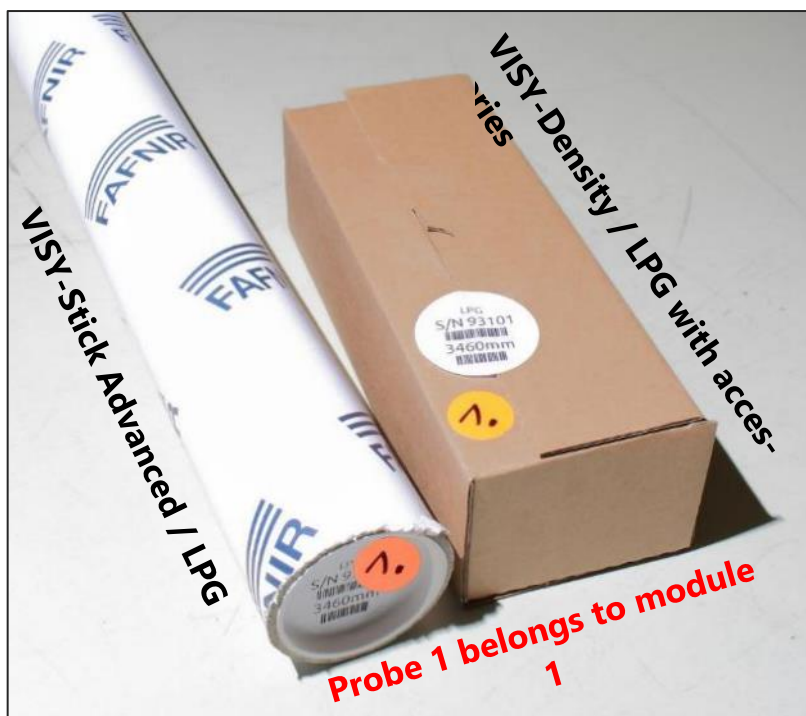
To operate the VISY-Density module, in VISY-Command an interface VI-4 with firmware 4.06 or higher is required. The firmware version is displayed after the reset button of the VI-4 is pressed. The first 3 numbers appearing one after the other (e.g. 4 ⇒ 0 ⇒ 6) on the 7-segment display show the version. If the firmware is below 4.06, please contact our technical support.



After installation of the level sensor, the VISY-Command central unit must be configured with the VISY-Setup software application.

3.1 Scope of delivery

VISY-Density and optional additional floats are supplied in a box separated from the level sensor. It must be mounted on the probe tube of the level sensor on site.



The module and probe are clearly numbered for the appropriate assignment, e.g. module 1 belongs to probe 1, etc.

In case of retrofitting, only the VISY-Density module with mounting accessories will be sent, see chapter 4.1.

3.2 Assembly

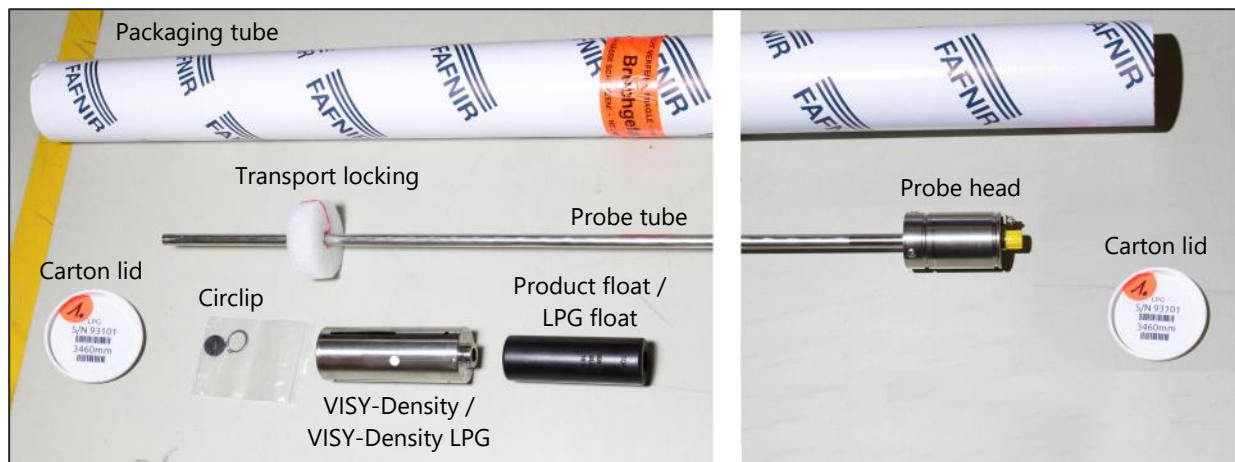


During the assembly, it is important to make sure that the probe tube is not bent. Protect the floats from knocks at all times. Humidity must not enter the M12 connector.



The VISY-Density module must be mounted on the probe tube on site.

3.2.1 VISY-Density with VISY-Stick Advanced



- 1st Pull the VISY-Stick Advanced probe out of the packaging tube
- 2nd Remove transport locks and rubber bands
- 3rd Slide the LPG or product float with the TOP marking in the direction of the probe head onto the probe tube
- 4th With the VISY-Stick Advanced, slide the spacer onto the probe tube
- 5th Slide the VISY-Density module with the designation in direction of the probe head onto the probe tube
- 6th Slide the water float (option) with the top marking in the direction of the probe head onto the probe tube
- 7th Attach the circlip and the plastic safety ring with a circlip pliers at the end of the probe tube
- 8th Depending on the application, fix VISY-Density at the appropriate height of the probe tube with 2 setscrews (see Figure 1: VISY-Density and VISY-Density LPG:
 - 8th a) To measure the sump density: Distance between the end of the probe tube and the upper edge of the VISY-Density module is less than 190 mm
 - 8th b) To measure the product density: Distance between the end of the probe tube and the upper edge of the VISY-Density module is more than 215 mm

- 8th c) For VISY-Density LPG: mount the module at the lower end of the probe tube
- 9th Remove the transport locks (3 plastic plugs inserted laterally) from the VISY-Density Module

3.2.2 VISY-Density with VISY-Stick Flex



VISY-Stick Flex must not be bent during assembly apart from the straightening when installed in the tank. Protect the floats from knocks at all times. Humidity must not enter the M12 connector.



- 1st Lift the VISY-Stick Flex probe out of the box
- 2nd Remove transport locks and rubber bands
- 3rd Use an Allen key to loosen the weight from the end of the probe tube and remove it
- 4th If installed, remove the water float from the probe tube
- 5th Slide the VISY-Density module with the designation in direction of the probe head onto the probe tube
- 6th Push the water float (option) with the top marking onto the probe tube in the direction of the probe head

- 7th Slide the weight onto the probe tube
- 8th Using an Allen key, turn the setscrews of the weight in the groove of the probe tube until the stop is reached.
- 9th Depending on the application, fix VISY-Density at the appropriate height of the probe tube with the 2 setscrews (see Figure 1: VISY-Density and VISY-Density LPG:
- 9th a) To measure the sump density: Distance between the end of the probe tube and the upper edge of the VISY-Density module is less than 190 mm
- 9th b) To measure the product density: Distance between the end of the probe tube and the upper edge of the VISY-Density module is more than 215 mm



The VISY-Density module must not be fixed to the corrugated hose of the VISY-Stick Flex probe.

- 10th Remove the transport locks (3 plastic plugs inserted laterally) from the VISY-Density Module

3.3 Installation



The installation of the level sensors must be carried out only with the power disconnected.



Before installation, move the floats down as far as possible on the probe tube to prevent them from falling and being damaged when the probe is erected.



For installation in LPG tanks all corresponding safety precautions must be observed. The LPG tank must be properly emptied before installing the VISY-Density LPG module.



The transport lock of the VISY-Density module (3 plastic plugs inserted laterally) must be removed before installation.

For installation of the VISY-Stick level sensors see:



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

4 Retrofitting the VISY-Density module

An existing VISY-Stick Advanced, VISY-Stick Advanced LPG, or VISY-Stick Flex level sensor can be retrofitted with a VISY-Density module. The level sensor must be updated on-site with the calibration data of the VISY-Density module with the aid of a PC/laptop.



The VISY-Density module can only be operated with VISY-Stick Advanced probes from device number 40,000.



The VISY-Density module can only be operated with VISY-Stick Flex probes which are updated with a special firmware. Please contact our technical support.



The FAFNIR USB adapter (item no.900040) is required for retrofitting the VISY-Density module and for firmware updates, see installation instruction: FAFNIR USB adapter, art. no. 350000



During the assembly, it is important to make sure that the probe tube is not bent. Protect the floats from knocks at all times. Humidity must not enter the M12 connector.

4.1 Included parts of the VISY-Density extension set

When you order the VISY-Density extension set, you will receive the following components:

- VISY-Density or VISY-Density LPG
- Circlip and plastic safety ring
- Spacer for VISY-Stick Advanced
- Calibration data

4.2 Prerequisites

- VISY-Density configuration software
- Circlip pliers
- Hexagon (Allen) key for M4 setscrew (2 mm)

4.3 Removal of existing VISY-Stick level sensors



All installation and maintenance work, with the exception of functional testing, must be carried out with the power disconnected.



For installation in LPG tanks all corresponding safety precautions must be observed. The LPG tank must be properly emptied before removing or installing a level sensor.

For the removal of the level sensor, see also:



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

- 1st Disconnect the power supply of the VISY-Command
- 2nd Remove the equipotential cable and M12 connector from the probe head
- 3rd Write down the sensor number and tank number (assignment for the installation)
- 4th If available, unscrew the screw-in unit from the thread of the tank without loosening the probe tube from the screw-in unit, otherwise a new adjustment of the probe will be required
- 5th Carefully pull the probe out of the tank or the riser of the tank and ...
 - 5th a) VISY-Stick Advanced: ... place it on a clean surface
 - 5th b) VISY-Stick Flex: ... carefully roll it up
- 6th Loosen and remove from the end of the probe tube ...
 - 6th a) VISY-Stick Advanced: ... the circlip and the plastic safety ring using a circlip pliers
 - 6th b) VISY-Stick Flex: ... the weight using an Allan key
- 7th If installed, remove the water float from the probe tube

4.4 Mounting of the VISY-Density module

- 1st Slide the VISY-Density with the designation in direction of the probe head onto the probe tube
- 2nd Slide the water float (option) with the top marking in the direction of the probe head onto the probe tube
- 3rd Attach the circlip and the plastic safety ring with a circlip pliers at the end of the probe tube
- 4th Depending on the application, fix VISY-Density at the appropriate height of the probe tube with 2 setscrews (see Figure 1: VISY-Density and VISY-Density LPG:
 - 4th a) To measure the sump density: Distance between the end of the probe tube and the upper edge of the VISY-Density module is less than 190 mm
 - 4th b) To measure the product density: Distance between the end of the probe tube and the upper edge of the VISY-Density module is more than 215 mm
 - 4th c) For VISY-Density LPG: mount the module at the lower end of the probe tube



The VISY-Density module must not be fixed to the corrugated hose of the VISY-Stick Flex probe.

- 5th Remove the transport locks (3 plastic plugs inserted laterally) from the VISY-Density Module

4.5 Configuration of the VISY-Stick level sensor



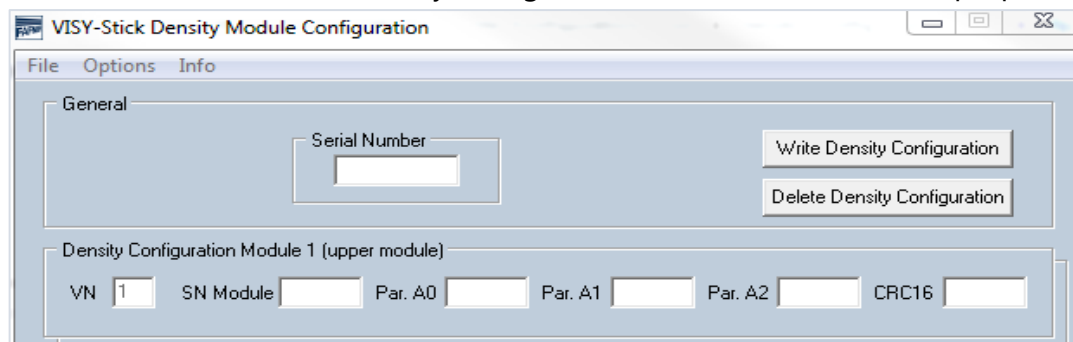
The level sensor must not be programmed in the installed state or in the potentially explosive environment.

- 1st Plug the FAFNIR USB adapter into a free USB port on the PC (the PC must have Internet connection to install the drivers), see also:



FAFNIR USB adapter, art. no. 350000

- 2nd Plug the M12 connector of the FAFNIR USB adapter into the probe head
- 3rd Install and start the VISY-Density configuration software on the PC / laptop



- 4th Entering the calibration data in the configuration program:
 - **Serial number** : automatically read by the configuration program
 - **VN:** ... Default value
 - **SN Module:** ... (See calibration data)
 - **Par. A0:** ... (See calibration data)
 - **Par. A1:** ... (See calibration data)
 - **Par. A2:** ... (See calibration data)
 - **CRC16:** ... (See calibration data)

The calibration data of the VISY-Density module are included in the scope of delivery.

- 5th Press the button "Write Density Configuration" to save the values
- 6th Remove the M12 connector of the FAFNIR USB adapter from the probe head
- 7th Plug the M12 connector of the VISY-Command in the probe head
- 8th Connect the power supply of the VISY-Command
- 9th Setting the level alarm in VISY-Command:
 - Connect the VISY-Command with the PC / laptop and start the VISY-Setup software application
 - Move the product float on the probe tube directly to the VISY-Density module

- In the VISY-Setup menu "current measured values -> product height in mm", read out the product height (corresponds to the product float position)
- Set the low alarm threshold to a value slightly higher than this product height

4.6 Installation of the VISY-Stick level sensor



The installation of the level sensors must be carried out only with the power disconnected.



For installation in LPG tanks all corresponding safety precautions must be observed. The LPG tank must be properly emptied before installing the VISY-Density LPG module.



Before installation, move the floats down as far as possible on the probe tube to prevent them from falling and being damaged when the probe is erected.



The transport lock of the VISY-Density module (3 plastic plugs inserted laterally) must be removed before installation.

For installation of the VISY-Stick level sensors see:



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

5 Maintenance

5.1 Servicing

The level sensors and associated floats are maintenance-free if they are operated according to the manufacturer's specifications and not used to measure other media.

5.2 Return shipment

Before returning any FAFNIR equipment, the Return Material Authorization (RMA) from FAFNIR customer service is required. Please contact your account manager or the customer service to receive the instructions on how to return goods.



The return of FAFNIR equipment is possible only with authorization by the FAFNIR customer service.

6 Technical Data

	VISY-Density	VISY-Density LPG
Measuring range [g/l]	710 ... 900	440 ... 660
Accuracy (VISY-Stick Advanced) [g/l]	< 1.0	
Accuracy (VISY-Stick Flex) [g/l]	2.0	
Resolution (VISY-Stick Advanced) [g/l]	0.1	
Temperature range [°C]	-40 ... +85	
Dimensions (diameter x height) [mm]	Ø 50 x 138.6	
Operating pressure [bar]	3.0	≤ 16
Material	Stainless steel	

6.1 Technical information

- For details on explosion protection, permissible ambient temperature (probe head), and the connection data please refer to the approvals and operating instructions.
- With a battery-powered radio transmitter, all level sensors can be used as wireless versions.
- All level sensors have protection class IP68 according to EN 60529 (IPX8: Immersion depth of 2 metres for 30 days).

For a detailed list of technical data see:



VISY-Stick VISY-Reed Data, multilingual, art. no. 350105



FAFNIR GmbH
Schnackenburgallee 149 c
22525 Hamburg, Germany
T: +49 / 40 / 39 82 07-0
E-mail: info@fafnir.de
Web: www.fafnir.com
