Technical Documentation

VISY-X

VISY-Density (LPG)

Version: 2
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1 Overview

The VISY-Density (LPG) module is an extension of the VISY-Stick Advanced level sensor in the VISY-X system for the measurement of product/sump density of fuel or liquefied petroleum gas (LPG). The module is available for use in fuel tanks as "VISY-Density" and for use in LPG tanks as "VISY-Density LPG".

The VISY-X system (Volume Information System) provides highly precise and continuous filling level measurements for all commercially available fuels and liquefied petroleum gas in up to 16 tanks. The product temperature and the water level are gauged simultaneously.

The VISY-X system comprises:

- VISY-Command (evaluation unit)
- VISY-Setup (software for configuring the VISY-Command)
- VISY-Stick (filling level sensors)
- Additional environmental sensors

☞ *VISY-Density (LPG) can be used only with the sensor VISY-Stick Advanced from device number 40,000 onwards.*

☞ *To operate the VISY-Density (LPG) module, 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 three digits of the 7-segment display show the versions in succession (e.g. 4 – 0 – 6). For firmware below 4.06 please contact our service department for an update.*

To install the VISY-Stick Advanced probe with the VISY-Density module, there are 2 possibilities:

In fuel tanks the filling level sensor can be installed without any difficulty via a screw-in unit with external thread and also via the pipe installation (riser).

Installation in LPG tanks is only possible with screw-in units.

The sensors have to be connected with the VISY-Command evaluation unit which is to be mounted inside the petrol station building. Before operating, the VISY-Command must be configured using a PC or notebook and the VISY-Setup software application.

The VISY-Command collects data from the sensors and transmits this to a higher-level system (e.g. POS) on request.

1.1 In this manual …

… you are guided through the installation and commissioning as well as retrofitting of the VISY-Density module.

This manual contains a description of all steps needed for the implementation. Please also observe the additional instructions in the following manuals:

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

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

1.2 Requirements for service engineers

The complete VISY-X system should only be installed by trained service engineers.

1.3 Safety instructions

The VISY-X system is optimised for use in petrol stations and is compatible with all commercially available fuels and liquefied petroleum gas. It serves to measure and evaluate the filling levels in tanks. The system must be used 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 following safety precautions must be observed in order to reduce the risk of injury, electric shocks, fire or damage to the equipment:

- Do not change or modify the system or add any equipment without the prior consent of the manufacturer.
- Only use original parts. These comply with the technical requirements specified by the manufacturer.
- The installation, operation and maintenance of the sensors and the VISY-Command must solely be carried out by expert personnel.
- The product may be powered only via the permissible power supply.

The safety instructions in this manual 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 manual that should be observed are written in italics and identified by this symbol.*

⚠ *When installing and servicing the sensors, the requirements of the Explosion Protection Regulations, the Industrial Health and Safety Regulations and the Equipment Safety Regulations as well as generally accepted rules of engineering and these operating instructions must be observed.*

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

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

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

⚠ *Before installation move the supplied floats to the bottom end of the probe tube, otherwise they will slip down suddenly when you erect the sensors and could be damaged when striking the circlip.*

☞ *During the installation, following data of the VISY-Stick sensors, tanks, and products are to be noted for configuring the VISY-Command:*
- *Device numbers of the sensors,*
- *Tank assignments of the sensors,*
- *Tank assignments of the product qualities,*
- *Terminal assignment of the sensors in the VISY-Command,*
- *Sensor distances from the central vertical axes of the tank*

2 VISY-Density (LPG)

The VISY-Density (LPG) module allows the determination of the product density or the sump density (level below the suction pipe) of commercially available fuels or liquefied petroleum gas. For fuel tanks the module is available as "VISY-Density" and for LPG tanks as "VISY-Density LPG"".

2.1 VISY-Density and VISY-Density LPG

VISY-Density and VISY-Density LPG differentiate themselves in the length of their modules and the measuring range (see Technical data):

	VISY-Density	VISY-Density (LPG)
Measuring range	660 … 900 g/l	440 … 660 g/l
Dimensions (DxH)	Ø 50 mm x 129 mm	Ø 50 mm x 143 mm

The set screws are intended for fixing the module, the 3 transport locks must be removed before operating the VISY-Density.

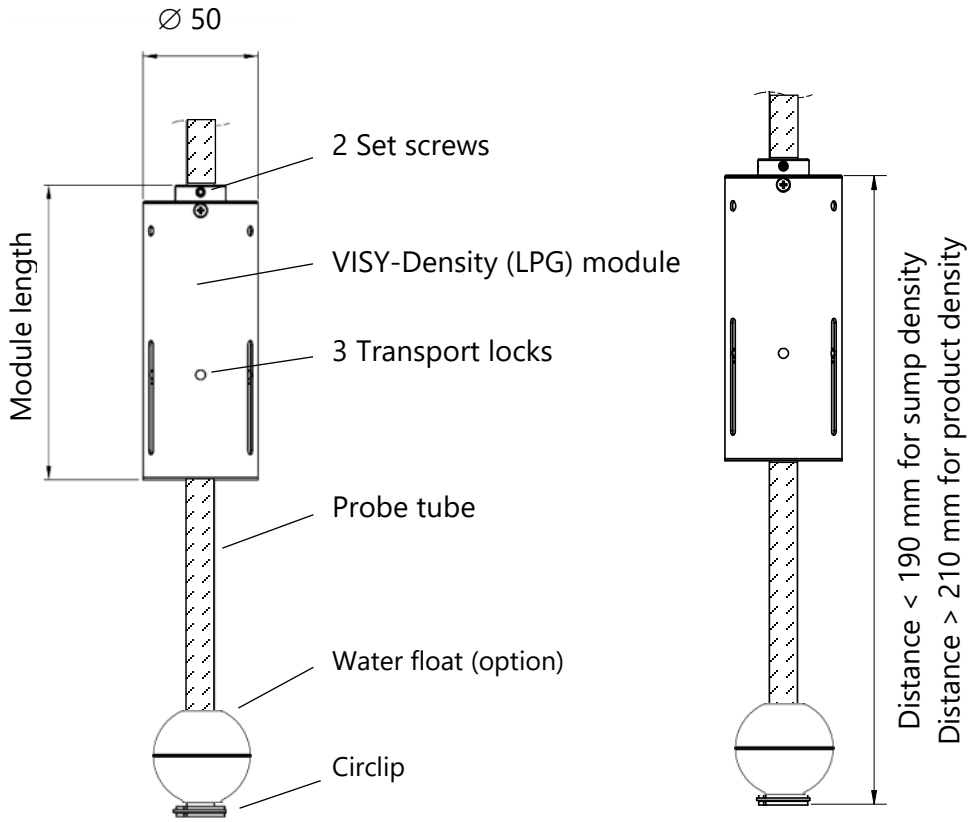


Figure 1: VISY-Density and VISY-Density LPG module

3 Installation VISY-Stick Advanced (LPG) Density

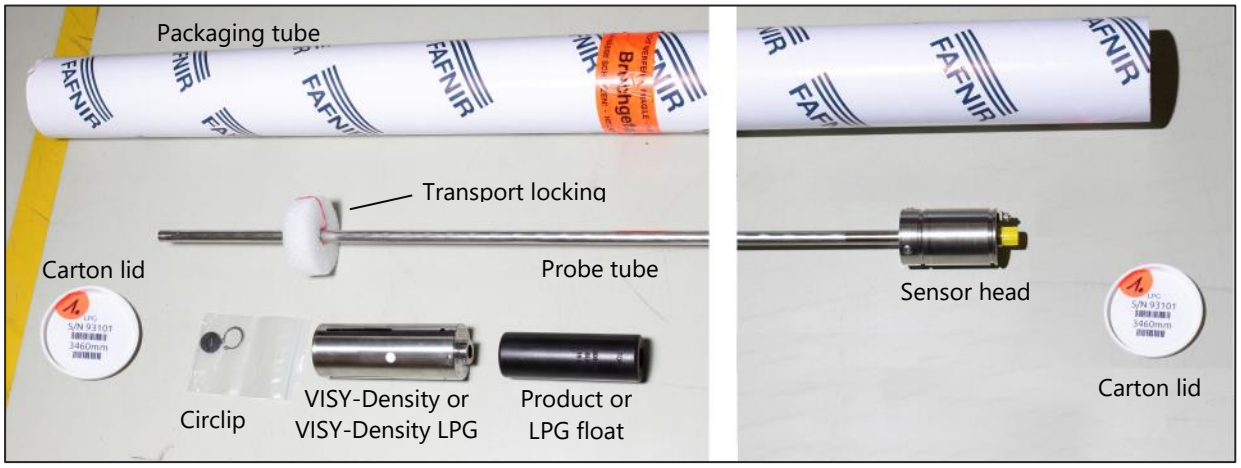
The VISY-Density (LPG) module with VISY-Stick Advanced filling level sensor is calibrated at the factory and can be operated after simple installation.

3.1 Complete scope of delivery of filling level sensor

VISY-Density and, if required, additional floats are supplied in a carton separate from the VISY-Stick Advanced probe. For the appropriate assignment the module and probe are numbered, e.g module 1 belongs to probe 1, etc.

3.2 Assembly and commissioning

3.2.1 Assembly of VISY-Density (LPG)



(1) Pull the VISY-Stick Advanced probe out of the packaging tube

(2) Remove transport locks and rubber bands

(3) Push the LPG or product float with the TOP marking onto the probe tube in the direction of the sensor head

(4) If available, push the spacer onto the probe tube below the product float

(5) Push the VISY-Density (LPG) module with the sensor designation onto the probe tube in the direction of the sensor head

(6) Push the water float (option) with the top marking onto the probe tube in the direction of the sensor head

(7) Attach the circlip to the end of the probe tube with circlip pliers

(8) Depending on the application (product density/sump density), fix the VISY-Density (LPG) on the probe tube at the appropriate height (2 set screws)

⚠ *VISY-Density must not be fixed on the corrugated hose of the VISY-Stick Flex probe.*

☞ *At a smaller distance than 190 mm between the probe tube end and the upper edge of the VISY-density module, the sump density is determined. At a distance higher than 210 mm, the product density is determined (see Fig. 1).*

(9) Remove the transport locks (3 plastic pins) from the VISY-Density Module

⚠ *The float of the VISY-Density is protected by a transport lock, which consists of three lateral inserted plugs. The transport lock must be pulled out before operating the VISY-Density.*

3.2.2 Installation and commissioning of the VISY-Stick Advanced

All wiring operations must solely be carried out with the power disconnected.

The relevant safety precautions must be adhered to for the installation in LPG tanks. The LPG tank must have been properly emptied before the VISY-Density LPG module is installed.

Depending on the application, 2 options are available for the installation of the VISY-Stick Advanced probe:

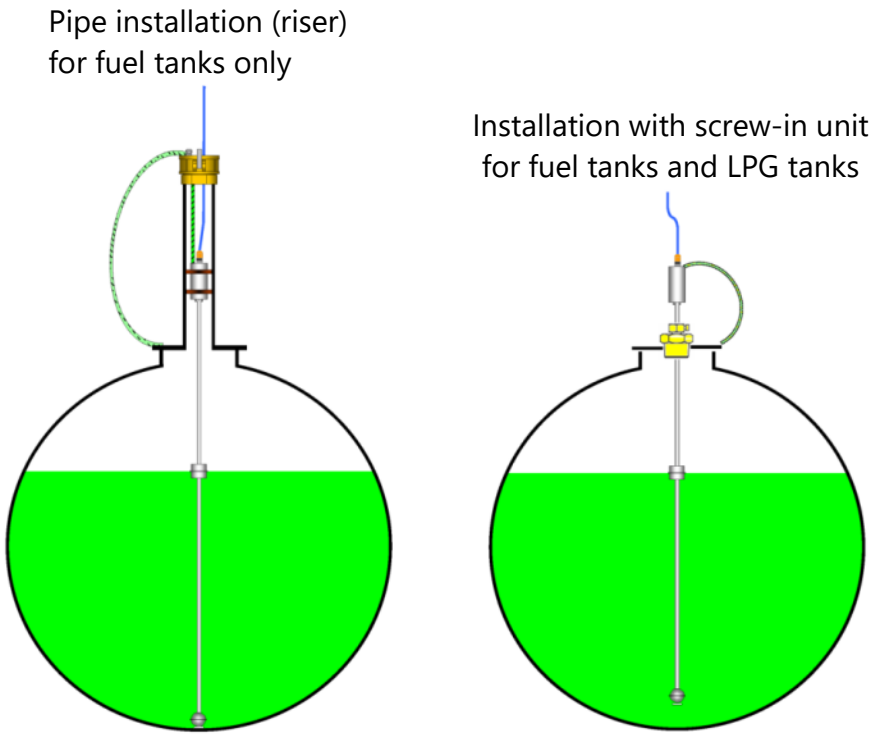


Figure 2: Riser installation and installation with screw-in unit

For installation and commissioning of the VISY-Stick Advanced probe, see:

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

4 Retrofitting the VISY-Density (LPG) module

An existing VISY-Stick Advanced (LPG) filling level sensor can be retrofitted with a VISY-Density (LPG) module. The sensor must be programmed on-site with the calibration data of the VISY-Density (LPG) module with the aid of a PC/laptop.

4.1 Scope of delivery of module for retrofitting

For a later order of the VISY-Density (LPG) extension set you will receive the following components:

- VISY-Density (LPG)
- Circlip
- Spacer
- Calibration data

4.2 Assembly and commissioning

⚠ *All wiring operations must solely be carried out with the power disconnected.*

⚠ *The relevant safety precautions must be adhered to for the installation in LPG tanks. The LPG tank must have been properly emptied before the VISY-Density LPG module is installed.*

☞ *For retrofitting the VISY-Density module, the FAFNIR USB adapter incl. Windows driver (art. no. 900040) is required, see installation instructions: FAFNIR USB adapter, art. no. 350000*

(1) Disconnect the power supply of the VISY-Command

(2) Remove the equipotential cable and M12 connector from the sensor head

(3) Removal of VISY-Stick Advanced (LPG)

- Note down the sensor number and tank number (assignment for the installation)
- Completely remove the screw-in unit, or carefully pull the sensor head with the centring rings out of the riser.
- Carefully pull the VISY-Stick Advanced (LPG) filling level sensor out of the tank
- Remove the circlip from the end of the probe tube with circlip pliers
- If installed, pull the water float from the probe tube

(4) Assembly of VISY-Density (LPG)

- If available, push the spacer onto the probe tube below the product float
- Push the VISY-Density (LPG) with the sensor designation onto the probe tube in the direction of the sensor head
- Push the water float (option) with the top marking onto the probe tube in the direction of the sensor head
- Attach the circlip to the end of the probe tube with circlip pliers
- Depending on the application (product density/sump density), fix the VISY-Density (LPG) on the probe tube at the appropriate height (2 set screws)

☞ *At a smaller distance than 190 mm between the probe tube end and the upper edge of the VISY-density module, the sump density is determined. At a distance higher than 210 mm, the product density is determined (see Fig. 1).*

- Remove the transport locks (3 plastic pins) from the VISY-Density Module

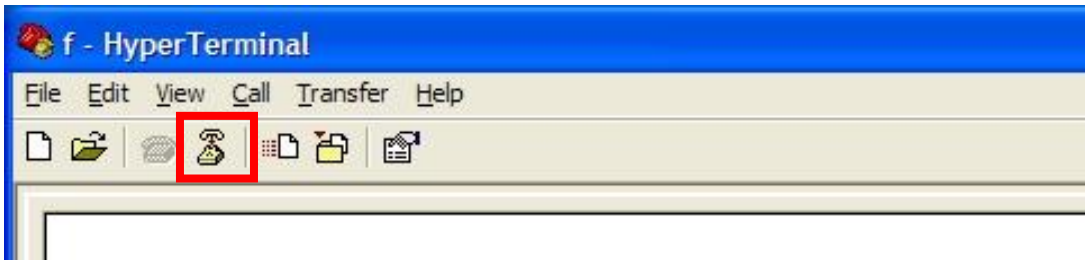
⚠ *The float of the VISY-Density is protected by a transport lock, which consists of three lateral inserted plugs. The transport lock must be pulled out before operating the VISY-Density.*

(5) PC installation of the FAFNIR USB adapter

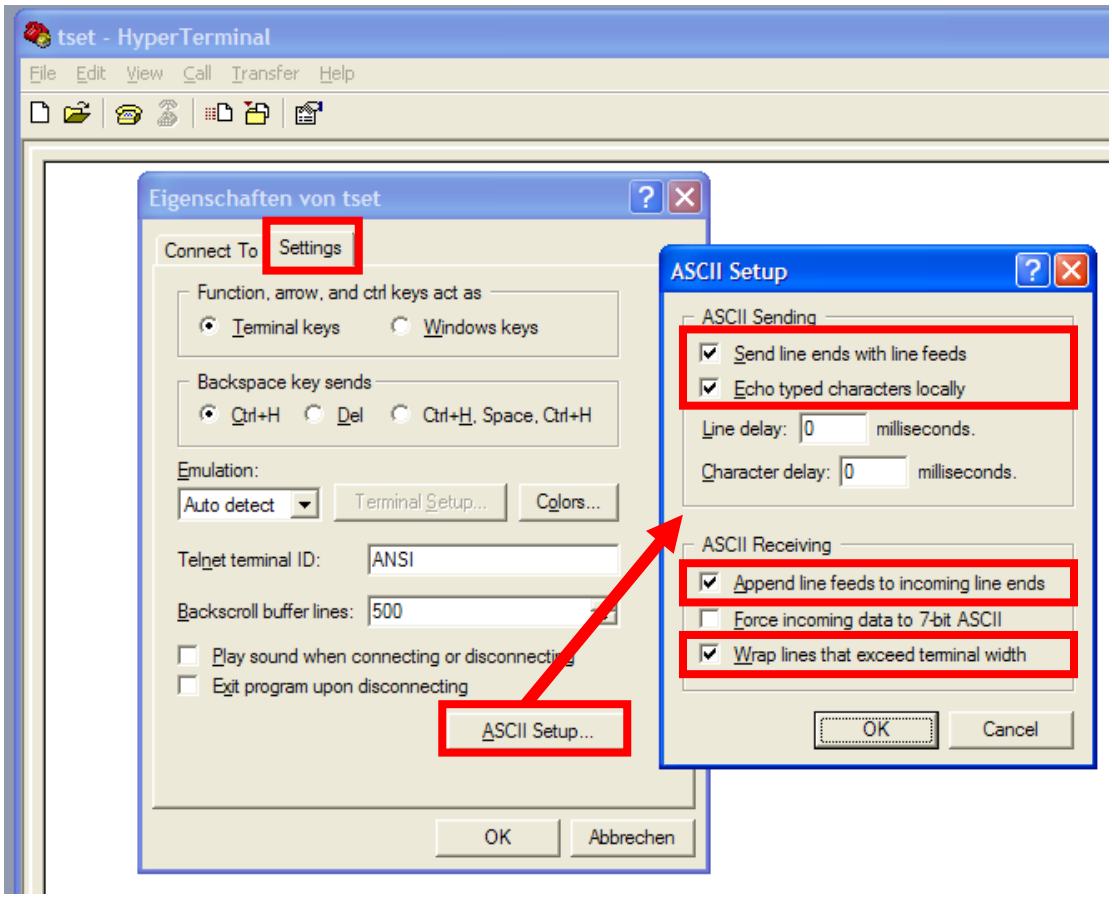
- Connect the FAFNIR USB adapter to the PC/laptop
- Now install the supplied Windows driver "FAFNIR USB adapter" and "FAFNIR USB serial adapter" and complete the installation in spite of the missing Windows confirmation prompt

(6) VISY-Density (LPG) configuration

- Start the Windows program "Hyperterminal" to configure the VISY-Density (LPG) module (if not available, the Hyperterminal must be installed)
- Connect the VISY-Stick Advanced (LPG) with the FAFNIR USB adapter
- Enter the used COM port of the FAFNIR USB adapter
- Enter connection parameters 1200 bps 8N1
- Interrupt the connection to the probe with the telephone symbol

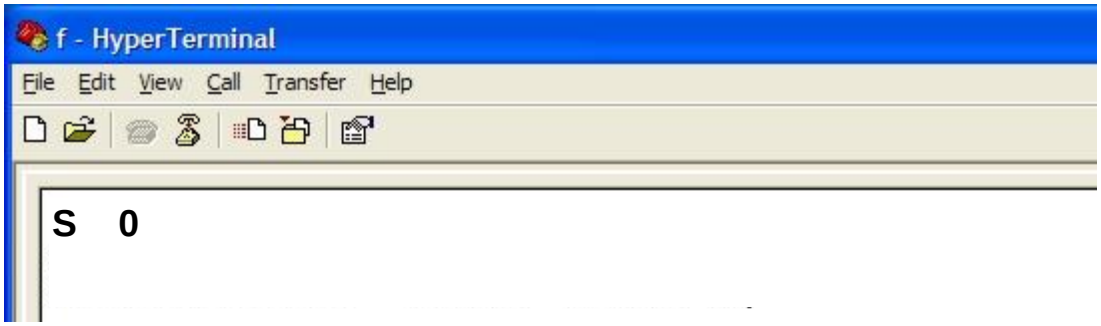


- Under File -> Characteristics-> Settings-> ASCII Setup select the following and confirm with OK:
"Send line ends with line feeds",
"Echo typed characters locally",
"Append line feeds to incoming line ends " and
"Wrap lines that exceed terminal width"

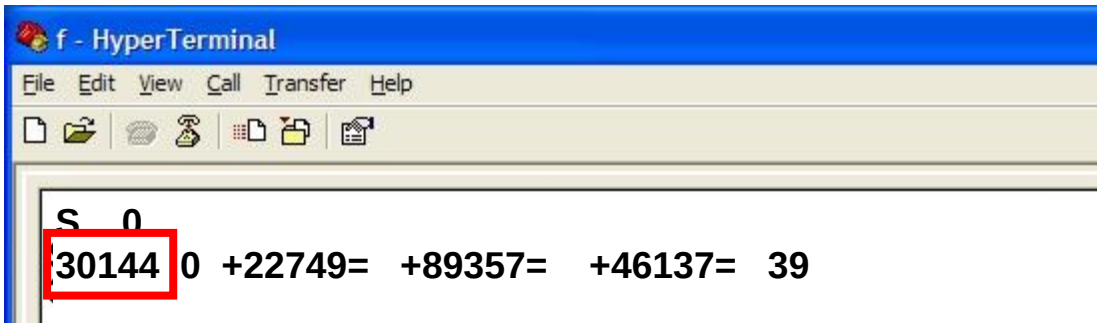


- Re-establish the connection to the probe with the telephone symbol

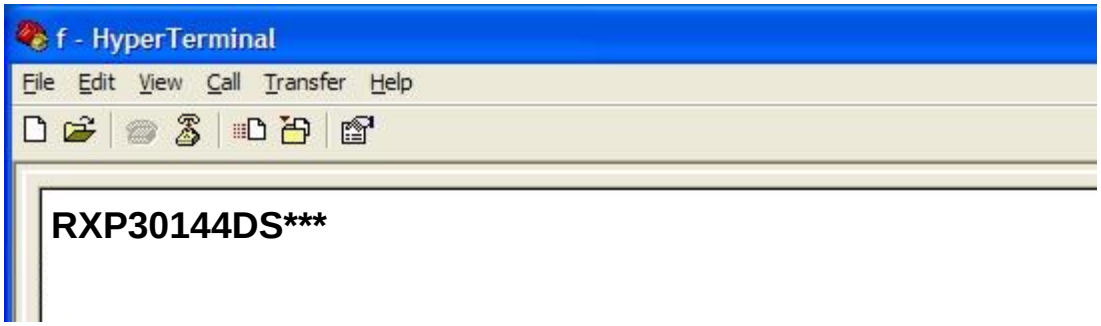
  Enter the following characters S, 4 spaces, 0: "S____0"
  and confirm with ENTER (see the following figure):



- Output of the VISY-Stick Advanced (LPG) device number as the first number (see example: 30144)



- Input of characters: RXP[the device number]DS[DS command]
  (the DS command *** is contained in the configuration table for all VISY-Density modules) and confirm with ENTER



Example of the configuration table with the DS commands:

Density Module #	DS Command
112	1 1 112 26945 19228 0 39133
117	1 1 117 25619 18174 0 62822
118	1 1 118 26381 18730 0 36352

- Output of "OK" for successful programming.
  If "OK" is not displayed, programming has not been carried out
- Remove the FAFNIR USB adapter from VISY-Stick Advanced (LPG)

(7) Connect the equipotential cable and M12 connector to the sensor head

(8) Connect the power supply of the VISY-Command

(9) VISY-Command fill level alarm setting

- Connect the VISY-Command with the PC/laptop and start the VISY-Setup software
- Specify product float position (actual measured values -> product height in mm) (product float directly above the VISY-Density module)
- Set the low alarm threshold to a value that is slightly higher than the product height

(10) Installation of the VISY-Stick Advanced (LPG)

- Carefully insert the VISY-Stick Advanced (LPG) filling level sensor into the tank
- Carefully insert the probe head with centring rings into the riser or tighten the screw-in unit

5 Overhaul

5.1 Maintenance

The 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 returned goods authorization by the FAFNIR customer service is required. Please contact your account manager or the customer care to get the instructions for the return of goods.

☞ *The return of FAFNIR equipment is possible only with authorization by the FAFNIR customer care.*

6 Technical data

	VISY-Density	**VISY-Density LPG**
Measuring range	660 … 900 g/l	440 … 660 g/l
Accuracy	± 2 g/l	
Resolution (VISY-Stick Adv.)	0.1 g/l	
Temperature range	-40 to +85 °C	
Dimensions (diameter x height)	Ø 50 mm x 129 mm	Ø 50 mm x 143 mm
Operating pressure	≤ 16 bar	
Material	Stainless steel	

7 List of figures

CE

FAFNIR™

EU–Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de Conformité

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22525 Hamburg / Germany

erklärt als Hersteller in alleiniger Verantwortung, dass die Produkte
declares as manufacturer under sole responsibility that the products
déclare sous sa seule responsabilité en qualité de fabricant que les produits

Füllstandsensoren
Filling Level Sensors
Capteurs de Niveau

TORRIX ... / VISY-Stick ...

den Vorschriften der europäischen Richtlinien
comply with the regulations of the European directives
sont conformes aux réglementations des directives européennes suivantes

2011/65/EU	**Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten**	**RoHS**
2011/65/EU	**Restriction of the use of certain hazardous substances in electrical and electronic equipment**	**RoHS**
2011/65/UE	**Limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques**	**RoHS**
2014/30/EU	**Elektromagnetische Verträglichkeit**	**EMV**
2014/30/EU	**Electromagnetic compatibility**	**EMC**
2014/30/UE	**Compatibilité électromagnétique**	**CEM**
2014/34/EU	**Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen**	**ATEX**
2014/34/EU	**Equipment and protective systems intended for use in potentially explosive atmospheres**	**ATEX**
2014/34/UE	**Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles**	**ATEX**

durch die Anwendung folgender harmonisierter Normen entsprechen
by applying the harmonised standards
par l'application des normes

RoHS / RoHS / RoHS	**EN 50581:2012**
EMV / EMC / CEM	**EN 61326-1:2013**
ATEX / ATEX / ATEX	**EN 60079-0:2012 + A11:2013**
	EN 60079-11:2012
	EN 60079-26:2015

Die Produkte sind bestimmt als Elektro- und Elektronikgeräte der RoHS-
The products are determined as electrical and electronic equipment of RoHS
Les produits sont déterminés comme des équipements électriques et électroniques de RoHS

Kategorie / Category / Catégorie	**Überwachungs- und Kontrollinstrumenten in der Industrie / Industrial Monitoring and Control Instruments / Instruments de contrôle et de surveillance industriels**

Die Produkte entsprechen den EMV-Anforderungen
The products comply with the EMC requirements
Les produits sont conformes aux exigences CEM

Störaussendung / Emission / Émission	**Klasse B / Class B / Classe B**
Störfestigkeit / Immunity / D'immunité	**Industrielle elektromagnetische Umgebung / Industrial electromagnetic environment / Environnement électromagnétique industriel**

Die notifizierte Stelle TÜV NORD CERT GmbH, 0044 hat EU-Baumusterprüfungen durchgeführt und folgende Bescheinigungen ausgestellt
The notified body TÜV NORD CERT GmbH, 0044 performed EU-type examinations and issued the certificates
L'organisme notifié TÜV NORD CERT GmbH, 0044 a effectué examen UE de type et a établi l'attestation

VISY-Stick ... / TORRIX Ex ...	**TÜV 99 ATEX 1496**
TORRIX Ex ...	**TÜV 01 ATEX 1772 X**

Hamburg, 21.07.2016
Ort, Datum / Place, Date / Lieu, Date

Geschäftsführer / Managing Director / Gérant: René Albrecht

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8.2 Technical information

- The VISY-Stick sensors have the following approvals:
  TÜV 99 ATEX 1496, IECEx TUN 05.0004, NEPSI GYJ 11.1568
- For details on explosion protection, permissible ambient temperature (sensor head), and the connection data please refer to the approvals and operating instructions.
- With a battery-powered radio transmitter, all sensors can be used as wireless versions.
- All 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

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