FAFNIR™

VISY-X
Automatic Tank Gauging System

VISY-View Touch

VISY-Command

VISY-Stick LPG

VISY-Stick Sump

VISY-Stick

VISY-Stick Interstitial

FAFNIR GmbH: Innovation with Tradition. Quality and satisfaction

Company

The FAFNIR GmbH, based in Hamburg, Germany, develops and manufactures since 1965 filling safety devices, overfill prevention devices, limit signal controllers and continuous level gauging solutions for all types of liquid.

The optimisation of process controls, improvements in cost efficiency and the protection of people and the environment are at the heart of our business.

Our close and trusting relationship with our customers is a key factor in the practice-oriented implementation of innovative ideas and the functionality of our products.

Quality for your satisfaction:

To provide all customers with devices of consistently high quality, FAFNIR years ago introduced the internationally-recognised, comprehensive quality management system in accordance with ISO 9001 (EN 29001). Our expertise in the development and manufacture of explosion-proof equipment is certified by an independent body. All our products are subject to strict FAFNIR quality requirements. We are committed to meeting international standards and applicable EU directives.

Content

VISY-X

Tank Level Gauging and Environmental Sensors

The system VISY-X supplies tank level information and supports a range of components from the field of environmental sensors. It improves cost efficiency and logistics at petrol stations and also helps to protect people and the environment. Through the integrated water detection it creates quality assurance.

In conjunction with the cash system, it offers real-time volume and leakage monitoring. and its support of remote data transfer makes it a high-quality resource management tool.

An excerpt from the VISY-X product range: VISY-Stick, VISY-Stick Sump, VISY-Command, VISY-RFT and VISY-Output

Application

VISY-X, the high-precision tank gauging system, is specially designed for use in petrol stations. Its modular architecture, however, also makes it ideal for use as a tank management system for any area of industry in which mineral oil products are stored. VISY-X is suitable for both underground tanks and above-ground storage tanks.

Features of the FAFNIR technology

- High-precision level and environmental sensors based on the magnetostrictive measuring principle
- In conjunction with remote data transfer, it is an efficient resource management tool
- Economical resource management of the petrol station network

- Permanent display of tank contents
- Continuous water level reading
- Delivery volume monitoring
- All wetted parts are made of high-quality stainless steel
- Easy and cost-effective start-up
- Maintenance-free

- Connection to a wide range of cash systems (PoS) with manufacturer specific interfaces
- Optional: IFSF-LON field bus technology
- Optional: wireless link with long battery life
- Worldwide approval: ATEX, NEPSI, IECEx and UL-Brazil
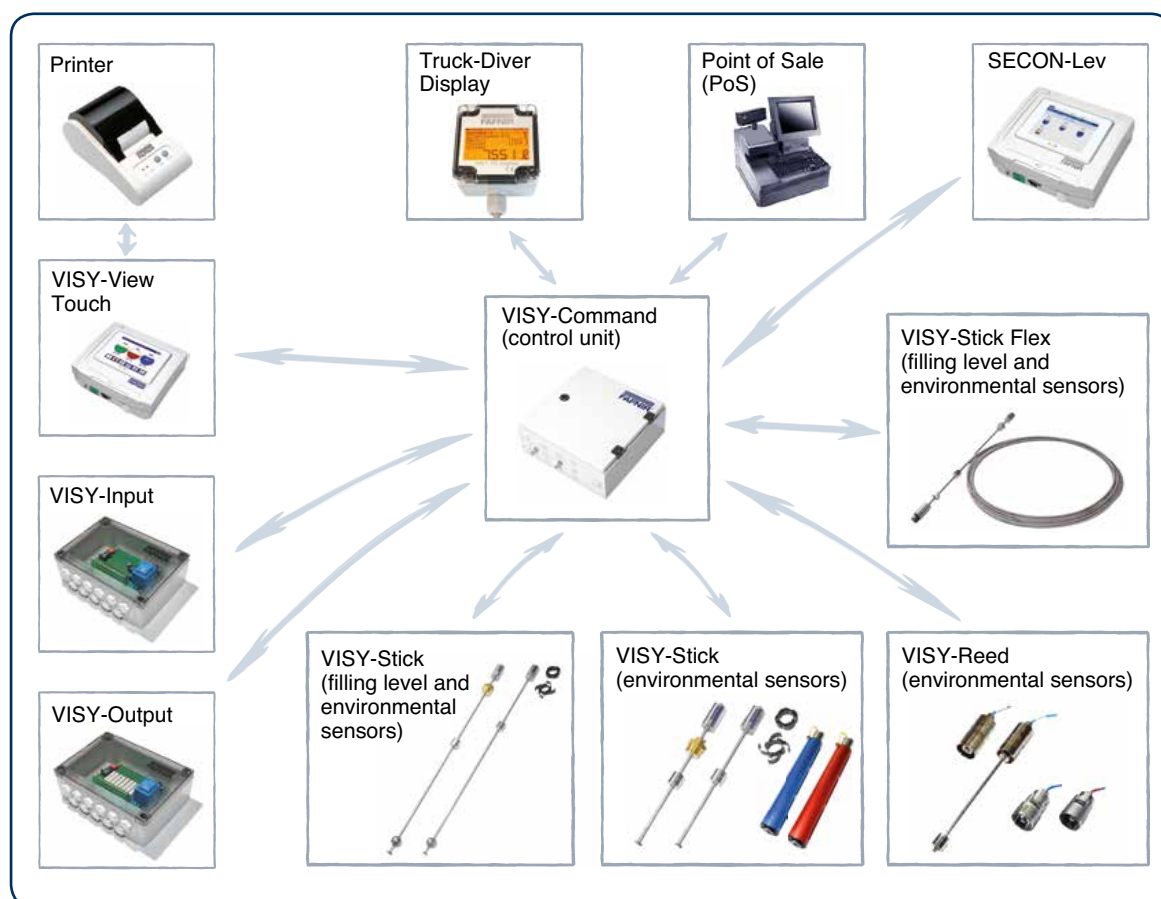- Certificates: CPA, EPA, OIML

Function description

One system of VISY-X comprises 1 to 16 VISY-Stick sensors and a VISY-Command control unit. It can be optionally extended by a wide range of hardware and software components (e. g. environmental sensors, I/O interfaces). The VISY-Stick magnetostrictive level sensor provides highly accurate readings of the product filling level, product temperature and water level. The VISY-Command control unit contains the power supply for the VISY-Stick sensors with its variety of integrated protocols and is able to interface to a wide range of management systems (PoS / BOS). There is also a comprehensive selection of connection methods for the PC, display, modem, alarm systems, etc. The VISY-X sensors are able to be connected wirelessly to the VISY-Command RF control unit.

VISY-X system

Printer

Truck-Diver Display

Point of Sale (PoS)

SECON-Lev

VISY-View Touch

VISY-Command (control unit)

VISY-Stick Flex (filling level and environmental sensors)

VISY-Input

VISY-Output

VISY-Stick (filling level and environmental sensors)

VISY-Stick (environmental sensors)

VISY-Reed (environmental sensors)

System Design

Level / environmental sensor	Control unit	Display	Software
Magnetostrictive Sensors	VISY-Command 2/4/8/16	VISY-View Touch	VISY-Monitor
Reed sensors	VISY-Command GUI		
	VISY-Command RF		

VISY-Stick

The level and environmental sensor based on the magnetostrictive measuring principle

VISY-Stick is a level and environmental sensor that has been specially designed to offer high-precision volume and leakage monitoring.

VISY-Stick magnetostrictive sensors with screw-in unit (left) and for riser installation (right)

Function

The VISY-Stick sensor operates in accordance with the magnetostrictive measuring principle. The probe tube contains a wire made of magnetostrictive material. Magnets integrated in the floats magnetise the wire at the float position. The sensor electronics transmit current pulses through the wire, which generate a circular magnetic field. A torsional wave develops at the point where the two magnetic fields overlap and it propagates towards the probe head. In the probe head, these waves are converted into an electrical signal. The float positions and the temperature are calculated from the different propagation times.

Design

A VISY-Stick comprises:
» Stainless steel sensor housing
» Stainless steel probe tube
» Brass screw-in unit (height adjustable)*
» Stainless steel product float
» Stainless steel water float

Features of the FAFNIR technology

- High-precision sensors based on the magnetostrictive measuring principle
- Detects product filling level, product temperature and water level

- All wetted parts are made of high-quality stainless steel
- Maintenance-free
- Permanent self-diagnostics
- Also suitable for AdBlue

- Optional: with 1" floats and screw-in unit
- Wireless link to VISY-Command supported

* for use in AdBlue, the screw-in unit is made of stainless steel

Technical data
VISY-Stick

Standard version

» Product:
  Accuracy ± 0.5 mm;
  Repeatability ± 0.1 mm;
  Resolution 0.001 mm;
  Response threshold 75 mm*;
  Float Ø 43 mm, 1½";

» Water:
  Accuracy ± 2 mm;
  Repeatability ± 0.5 mm;
  Resolution 0.001 mm;
  Response threshold 23 mm*;
  Float Ø 43 mm, 1½";

  * Product density and the position of the
    other float may result in variations

» Temperature:
  Measuring range
  – 40 °C to + 85 °C;
  Accuracy ± 1 °C (20 °C);
  Repeatability ± 0.5 °C;
  Resolution 0.001 °C
» Process connection:
  R 1½ screw-in unit,
  brass, height adjustable
» Electrical connection:
  M12 Plug connector
» Casing protection: IP68
» Sensor material:
  Stainless steel
» Approvals:
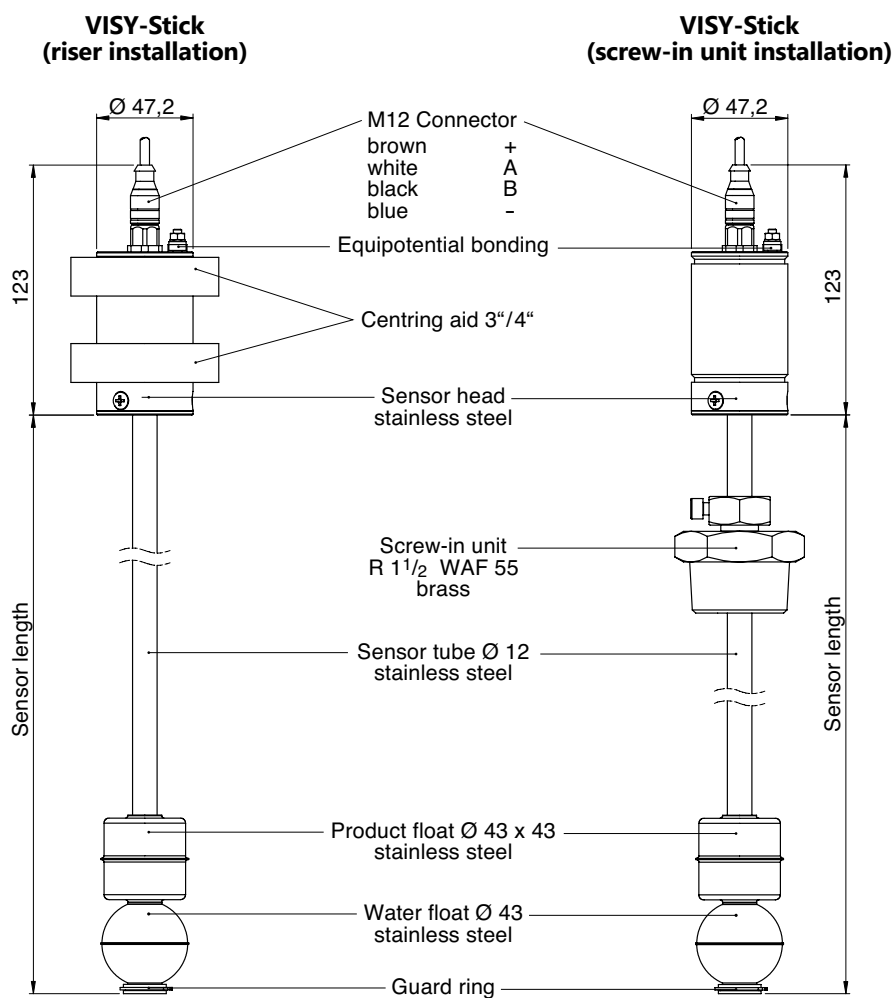 ATEX, NEPSI, IECEx, UL-Brazil
» Certificates: CPA, OIML

Options

» Riser installation
» Battery-powered transmitter
  VISY-RFT for wireless link to
  the VISY-Command RF control
  unit
» 1" installation kit
» Screw-in unit made of
  stainless steel

VISY-Stick

VISY-Stick (riser installation)

VISY-Stick (screw-in unit installation)

Ø 47,2

Ø 47,2

M12 Connector
brown   +
white   A
black   B
blue   –

Equipotential bonding

Centring aid 3"/4"

Sensor head
stainless steel

123

Screw-in unit
R 1¹/₂ WAF 55
brass

Sensor tube Ø 12
stainless steel

Sensor length

Product float Ø 43 x 43
stainless steel

Water float Ø 43
stainless steel

Guard ring

Dimensions in mm

FAFNIR™

VISY-Stick Advanced

The high-precision level and environmental sensor based on the magnetostrictive measuring principle

The VISY-Stick Advanced level sensor is ideal for applications that demand maximum precision and is also suitable for detecting tank leaks.

VISY-Stick Advanced magnetostrictive sensors with screw-in unit (left) and for riser installation (right)

Function description

The VISY-Stick Advanced sensor operates in accordance with the magnetostrictive measuring principle. The probe tube contains a wire made of magnetostrictive material. Magnets integrated in the floats magnetise the wire at the float position. The sensor electronics transmit current pulses through the wire, which generate a circular magnetic field. A torsional wave develops at the point where the two magnetic fields overlap and it propagates towards the probe head. In the probe head, these waves are converted into an electrical signal. The float positions are calculated from the different propagation times. For precision temperature measurements, the sensor tube of the VISY-Stick Advanced contains temperature sensors.

Features of the FAFNIR technology

- Detects product filling level, water level, and temperatures at multiple points along the measurement length
- Precise gauging of product temperature by means of temperature sensors
- Detects even the most minimal of level changes
- Wireless link to a VISY-Command RF possible
- Certificates: CPA, EPA, OIML

Edition 05.2016 Technical changes reserved

Technical data
VISY-Stick Advanced

Standard version
» Product:
   Accuracy ± 0.25 mm;
   Repeatability ± 0.05 mm;
   Resolution 0.001 mm;
   Response threshold 75 mm*;
   Float Ø 54 mm, 2";
» Water:
   Accuracy ± 2 mm;
   Repeatability ± 0.5 mm;
   Resolution 0.001 mm;
   Response threshold 23 mm*;
   Float Ø 43 mm, 1½";

   * Product density and the position of the
     other float may result in variations

» Temperature:
   Measuring range
   – 40 °C to + 85 °C;
   Accuracy ± 0.3 °C (20 °C);
   Repeatability ± 0.1 °C;
   Resolution 0.001 °C
» Process connection:
   R 1½ screw-in unit,
   brass, height adjustable
» Electrical connection:
   M12 Plug connector
» Casing protection: IP68
» Sensor material:
   stainless steel
» Approval:
   ATEX, NEPSI, IECEx, UL-Brazil
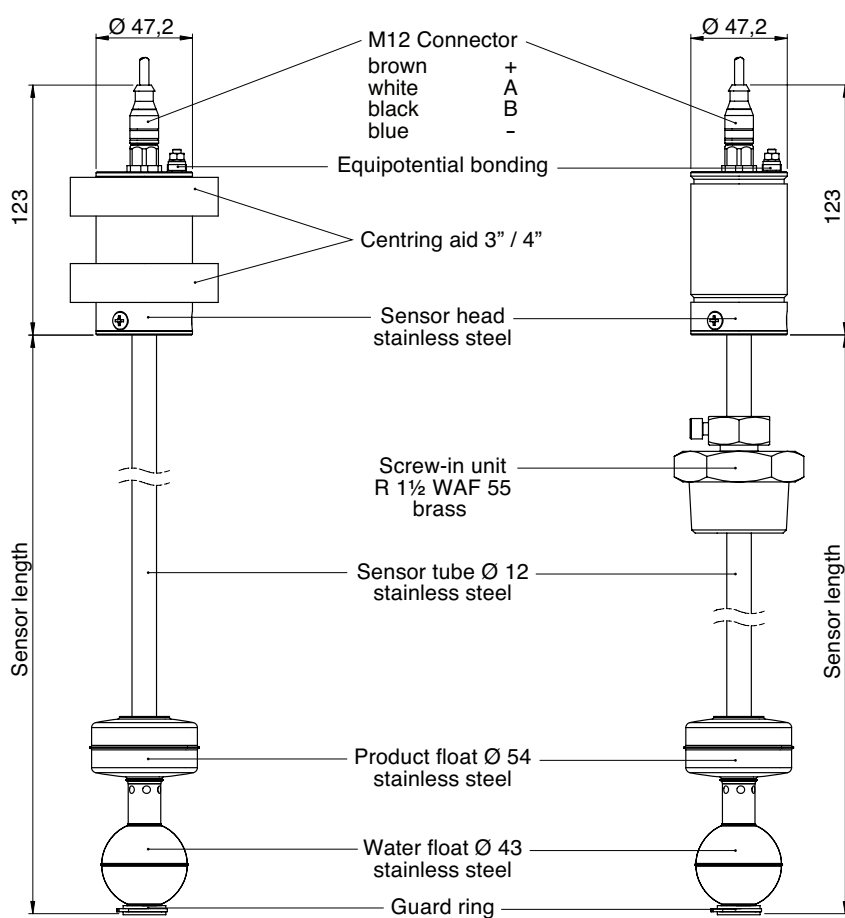» Certificates: CPA, EPA, OIML

Options
» Riser installation
» Battery-powered transmitter
   VISY-RFT for wireless link to
   the VISY-Command RF control
   unit
» Screw-in unit made of
   stainless steel

VISY-Stick Advanced

VISY-Stick Advanced (riser installation)

VISY-Stick Advanced (screw-in unit installation)

Ø 47,2

M12 Connector
brown   +
white   A
black   B
blue   –

Equipotential bonding

Centring aid 3" / 4"

Sensor head
stainless steel

Screw-in unit
R 1½ WAF 55
brass

Sensor tube Ø 12
stainless steel

Product float Ø 54
stainless steel

Water float Ø 43
stainless steel

Guard ring

123

Sensor length

Dimensions in mm

VISY-Density

The highly accurate density measuring module

The VISY-Density module is designed for the measurement of fuel densities. It can be mounted on the VISY-Stick Advanced sensor without the need to install an additional sensor. In combination with the density module the VISY-Stick Advanced provides accurate information about the product filling level, water level, product temperature and product density in the tank.

The magnetostrictive sensors
VISY-Stick Advanced Density with
screw-in unit (left) and
for riser installation (right)

Function description

Inside the VISY-Density module* the buoyancy of a displacer is measured (Archimedean principle). It provides precise information as to whether fuel in the tank is in conformity with legal and in-house standards. Any changes and deteriorations of the product quality can be measured and alarms can be configure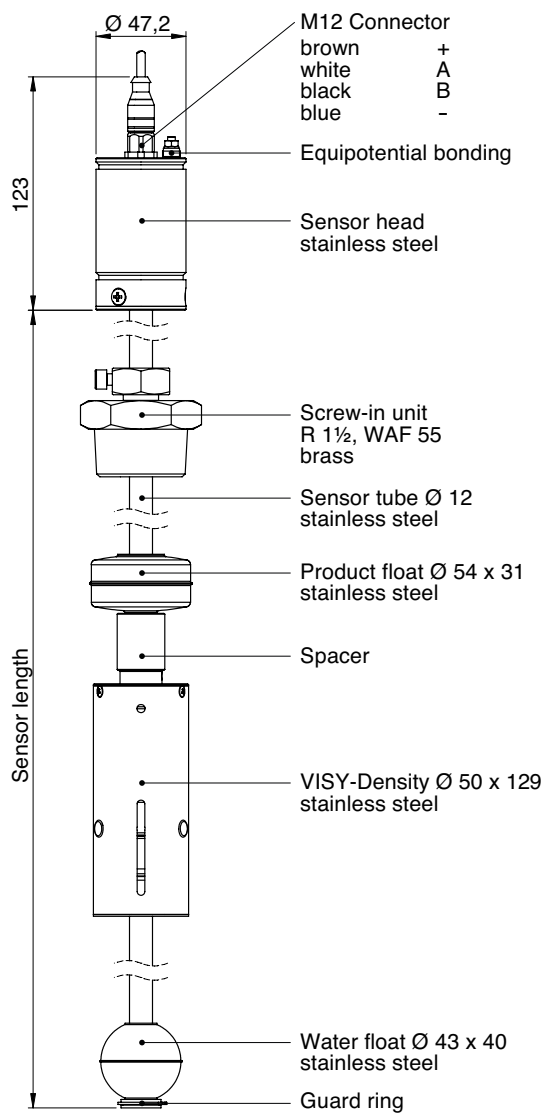d in VISY-Command. The tank level gauging and VISY-Density combination will enable you to control and manage your valuable wet stocks in every respect.

* Patents pending

Features of the FAFNIR technology

- Continuous and hysteresis free density measurement
- Function in conjunction with the level sensor VISY-Stick Advanced

- Compact design
- Quality control of fuels
- Recognition of water containing sump fluids in ethanol blends

- Determination of water content in E85 to E100 fuels

Edition 05.2016   Technical changes reserved

VISY-Density

Ø 47,2

M12 Connector
brown	+
white	A
black	B
blue	–

Equipotential bonding

Sensor head
stainless steel

123

Screw-in unit
R 1½, WAF 55
brass

Sensor tube Ø 12
stainless steel

Product float Ø 54 x 31
stainless steel

Spacer

Sensor length

VISY-Density Ø 50 x 129
stainless steel

Water float Ø 43 x 40
stainless steel

Guard ring

Dimensions in mm

Example

Technical data VISY-Density

» Product:
   Accuracy ± 2 g/l,
   Resolution 0.1 g/l
» Temperature range:
   – 40 °C to + 85 °C
» Dimensions:
   Diameter 50 mm;
   Length 129 mm
» Operating pressure:
   up to 16 bar
» Sensor material:
   Stainless steel

VISY-Stick Flex

**The flexible level and environmental sensor
based on the magnetostrictive measuring principle**

VISY-Stick Flex is a level sensor
which is especially designed for
bulk storage tanks.

Function description

The VISY-Stick Flex sensor oper-
ates according to the magneto-
strictive measuring principle. A
wire made of magnetostrictive
material has been integrated
into the flexible corrugated
hose. The special design of the
sensor allows the sensor body to
be bent. So the VISY-Stick Flex
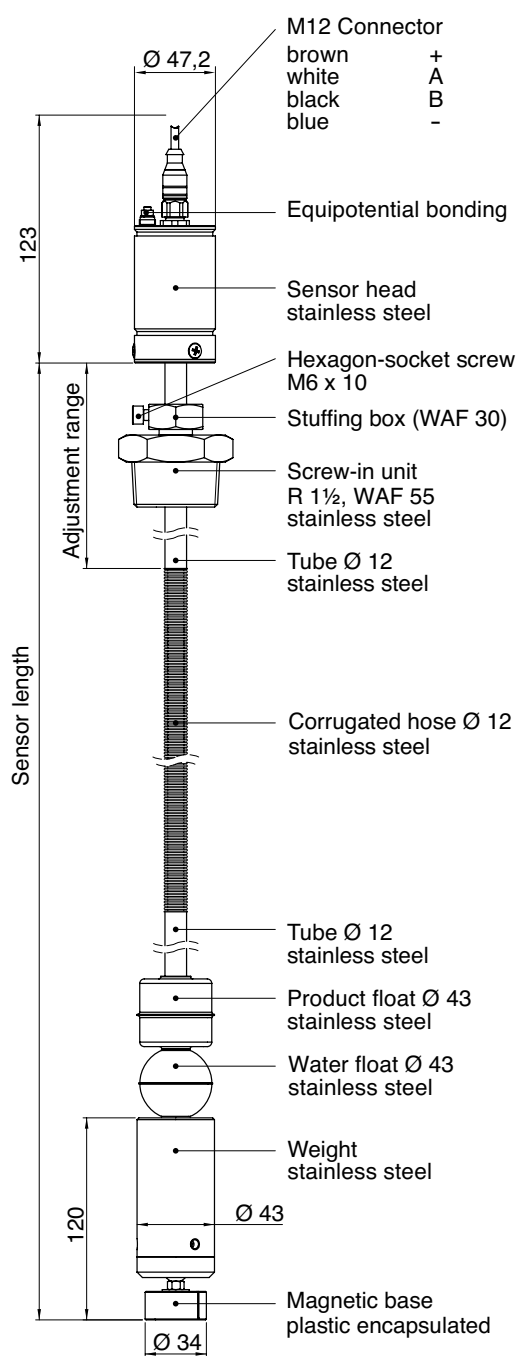can be packed compactly and
shipped at low cost. Another
advantage is the easy installa-
tion. A weight at the lower end
of the sensor stretches it out
to its full length, and a magnet
placed below the weight secures
the sensor to be in place. When
the magnet is in contact with
the bottom of the tank (after
installation) any unintentional
movement of the VISY-Stick Flex
is avoided. When the installa-
tion of the VISY-Stick Flex level
sensor has been completed, the
corrugated hose is positioned
vertically and both the product
and the water float can freely
move up and down.

Features of the FAFNIR technology

- High-precision sensor based
  on the magnetostrictive
  measuring principle
- Detects product filling level,
  product temperature and
  water level
- Sensor length up to 15 meters

- Compact packaging and
  easy transport thanks to
  the corrugated tube
- Weight at end of sensor
  guarantees vertical installation
- Lower end of the sensor held
  in place by a magnet

- Installation in tanks with
  low ceiling height possible
- Easy installation
- Installation in 1½˝ process
  connection possible
- Wireless link to a
  VISY-Command RF possible
- Maintenance-free

VISY-Stick Flex

M12 Connector
brown	+
white	A
black	B
blue	–

Ø 47,2

123

Equipotential bonding

Sensor head
stainless steel

Adjustment range

Hexagon-socket screw
M6 x 10

Stuffing box (WAF 30)

Screw-in unit
R 1½, WAF 55
stainless steel

Tube Ø 12
stainless steel

Sensor length

Corrugated hose Ø 12
stainless steel

Tube Ø 12
stainless steel

Product float Ø 43
stainless steel

Water float Ø 43
stainless steel

Weight
stainless steel

120

Ø 43

Magnetic base
plastic encapsulated

Ø 34

Dimensions in mm

Technical data
VISY-Stick Flex
Standard version
- » Measurement lengths up to 15 m
- » Product:
  Accuracy ± 2 mm;
  Repeatability ± 0.5 mm;
  Resolution 0.001 mm;
  Response threshold 185 mm*;
  Float Ø 43 mm, 1½";
- » Water:
  Accuracy ± 3 mm;
  Repeatability ± 0.5 mm;
  Resolution 0.001 mm;
  Response threshold 140 mm*;
  Float Ø 43 mm, 1½";

* Product density and the position of the other float may result in variations

- » Temperature:
  Measuring range
  – 40 °C to + 85 °C;
  Accuracy ± 1.5 °C (20 °C);
  Repeatability ± 0.5 °C;
  Resolution 0.001 °C
- » Process connection:
  R 1½ screw-in unit,
  Stainless steel,
  Adjustment range
  approx. 500 mm
- » Electrical connection:
  M12 Plug connector
- » Casing protection: IP68
- » Sensor material:
  Stainless steel;
  Encapsulation of
  magnetic base:
  Conductive plastic
- » Approvals:
  ATEX, IECEx, NEPSI

Options
- » Battery-powered transmitter
  VISY-RFT for wireless link
  to the VISY-Command RF
  control unit

VISY-Stick LPG

The level sensor for liquefied petroleum gas based on the magnetostrictive measuring principle

The VISY-Stick LPG level sensor supplies information about the fuel levels in LPG tanks.

The magnetostrictive sensor with buna float and pressure-resistant stainless steel screw connection is specially designed for use in liquefied petroleum gas.

VISY-Stick LPG for direct installation in the tank

Function

The VISY-Stick LPG sensor operates in accordance with the magnetostrictive measuring principle. The probe tube contains a wire made of magnetostrictive material. A magnet integrated in the float magnetises the wire at the float position. The sensor electronics transmit current pulses through the wire, which generate a circular magnetic field. A torsional wave develops at the point where the two magnetic fields overlap and it propagates towards the probe head. In the probe head, these mechanical waves are converted into an electrical signal. The float positions and the temperature are calculated from the propagation time.

Features of the FAFNIR technology

- Magnetostrictive sensor for use in liquefied petroleum gas (buna float, pressure-resistant stainless-steel screw connection)

- Continuous monitoring of product level and product temperature
- Also available with a 1" float

- Two installation versions: direct installation or installation with installation kit

Technical data
VISY-Stick LPG

Standard version
- » **Product:**
  Accuracy ± 2 mm;
  Repeatability ± 0.5 mm;
  Resolution 0.001 mm;
  Response threshold 120 mm;
  Float Ø 43 mm, 1½";
- » **Temperature:**
  Measuring range
  – 40 °C to + 85 °C;
  Accuracy ± 1 °C;
  Repeatability ± 0.5 °C;
  Resolution 0.001 °C

- » **Process connection:**
  Screw-in unit ¾" NPT with
  1½" reducer, Stainless steel,
  height adjustable
- » **Electrical connection:**
  M12 Plug connector
- » **Casing protection:** IP68
- » **Sensor material:**
  Stainless steel
- » **Product float material:**
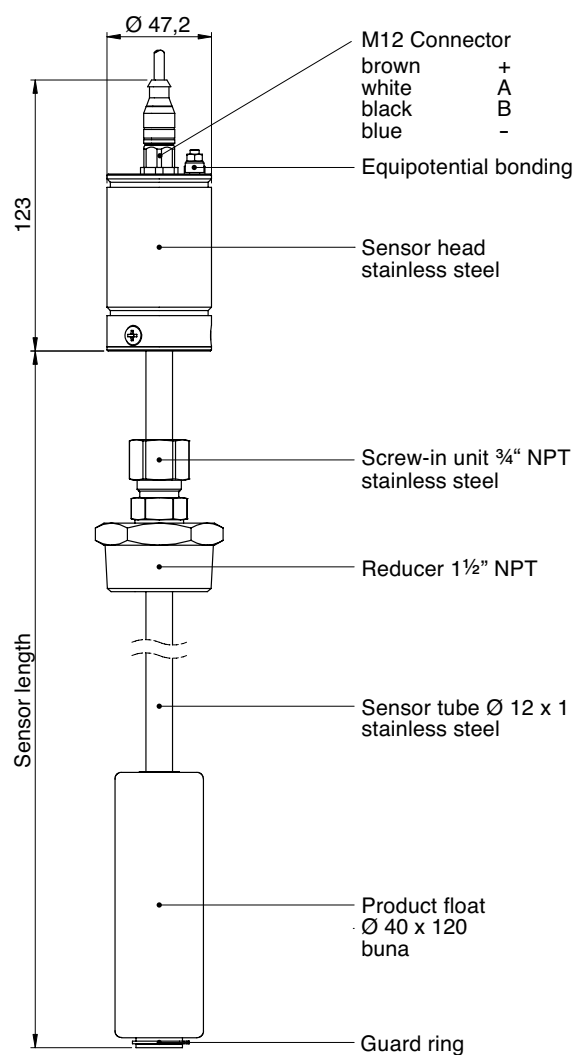 Buna
- » **Approvals:** ATEX, NEPSI, IECEx,
  UL-Brazil
- » **Certificates:** CPA, OIML

Options
- » **Battery-powered transmitter
  VISY-RFT for wireless link to
  the VISY-Command RF control
  unit**
- » **Variable LPG Installation Kit**
- » **Screw-in unit ½" NPT,
  Stainless steel**
- » **1" product float**

VISY-Stick LPG

Ø 47,2

123

Sensor length

M12 Connector
brown	+
white	A
black	B
blue	–

Equipotential bonding

Sensor head
stainless steel

Screw-in unit ¾" NPT
stainless steel

Reducer 1½" NPT

Sensor tube Ø 12 x 1
stainless steel

Product float
Ø 40 x 120
buna

Guard ring

Dimensions in mm

Variable LPG installation kit

The variable LPG installation kit comprises a jacketed pipe with special LPG float and a cutting ring fitting with ¾″ NPT external thread.

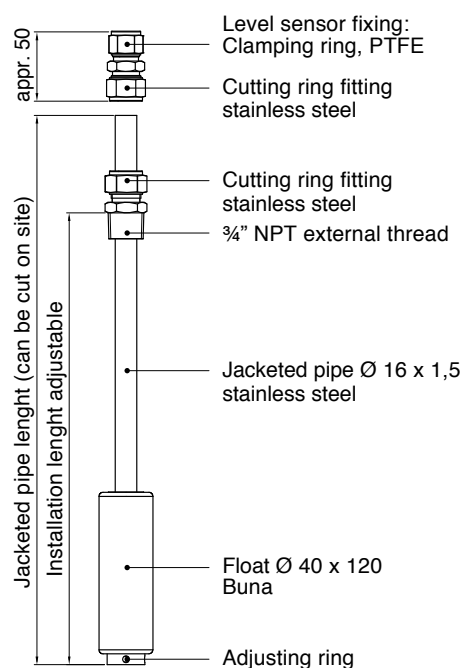**Variable LPG installation kit to install VISY-Stick LPG**

Function description

The installation length of the variable LPG installation kit can be adjusted. The exact installation dimensions do not need to be known for this installation.

The attachment to the process connection of the tank is done with a cutting ring fitting which is movable on the jacketed pipe and can be adapted to the tank diameter. If necessary, the length of the jacketed pipe can be cut on-site.

After fixing the installation kit, the level sensor is simply slid into the jacketed pipe and attached. Now, the level sensor is not in the pressurised chamber and can be replaced at any time without releasing the pressure in the tank.

Variable LPG installation kit

appr. 50

Jacketed pipe lenght (can be cut on site)

Installation lenght adjustable

Level sensor fixing:
Clamping ring, PTFE

Cutting ring fitting
stainless steel

Cutting ring fitting
stainless steel

¾″ NPT external thread

Jacketed pipe Ø 16 x 1,5
stainless steel

Float Ø 40 x 120
Buna

Adjusting ring

Dimensions in mm

Features of the FAFNIR technology

- Adjustable installation length
- No prior knowledge of exact installation length required
- Can be cut on-site

- One-time emptying of the tank during the installation
- Significant cost savings
- Easy installation

- Material: Stainless steel, buna
- Maintenance-free

VISY-Stick Interstitial

The leakage sensor for double-walled tanks based on the magnetostrictive measuring principle

The VISY-Stick Interstitial is a sensor for installation in the intermediate chamber and is designed to guarantee rapid leak detection. It is used in double-walled tanks whose intermediate chambers are filled with a leak detection fluid (e. g. brine, glycol, etc.). An alarm is issued from VISY-Command if the fluid level in the intermediate chamber leaves a specified range.

**VISY-Stick Interstitial
with screw-in unit (left)
and for riser installation (right)**

Function

The VISY-Stick Interstitial sensor operates in accordance with the magnetostrictive measuring principle. The probe tube contains a wire made of magnetostrictive material. A magnet integrated in the float magnetises the wire at the float position. The sensor electronics transmit current pulses through the wire, which generate a circular magnetic field. A torsional wave develops at the point where the two magnetic fields overlap and it propagates towards the probe head. In the probe head, these waves are converted into an electrical signal. The float position is calculated from the propagation time.

Features of the FAFNIR technology

- Continuous monitoring of the fluid level
- VISY-Command gives instant alarm in the event of a leak
- Easy and cost-effective to install and commission
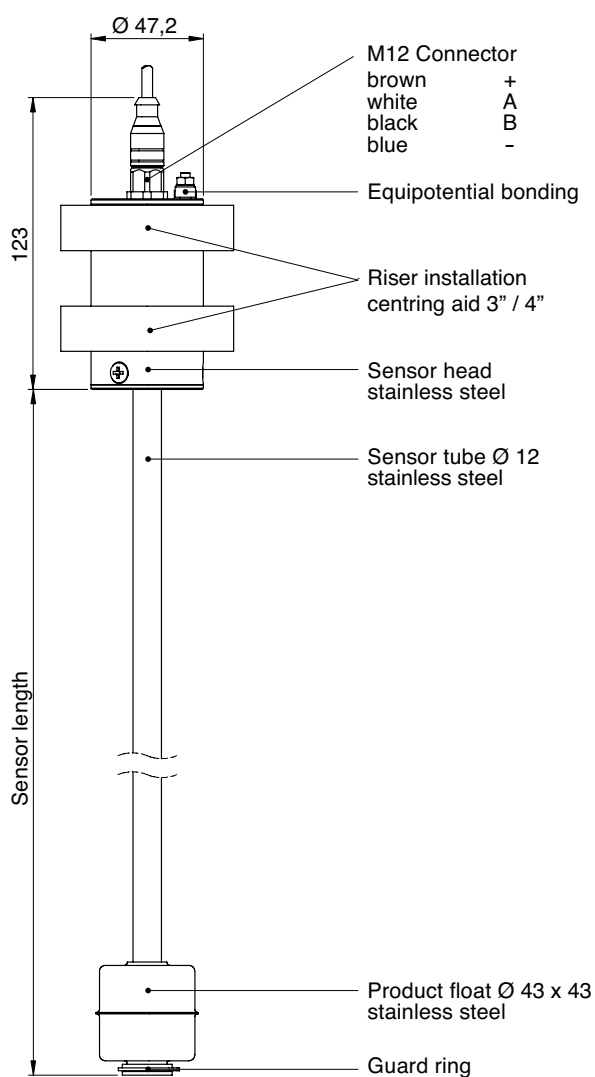
Technical data
VISY-Stick Interstitial
Standard version

» Product:
  Accuracy ± 0.5 mm;
  Repeatability ± 0.1 mm;
  Resolution 0.1 mm;
  Response threshold 40 mm;
  Float Ø 43 mm, 1½";
» Temperature:
  Measuring range
  – 40 °C to + 85 °C;
  Accuracy ± 1 °C;
  Repeatability ± 0.5 °C;
  Resolution 0.1 °C

» Process connection:
  Riser installation
  centering aid 3" / 4"
» Electrical connection:
  M12 Plug connector
» Casing protection: IP68
» Sensor material:
  Stainless steel
» Approvals: ATEX, IECEx, NEPSI,
  UL-Brazil

Options
» R 1½ screw-in unit, brass,
  height adjustable
» 1" installation kit
» Screw-in unit, stainless steel

VISY-Stick Interstitial

Ø 47,2

123

Sensor length

M12 Connector
brown   +
white   A
black   B
blue   –

Equipotential bonding

Riser installation
centring aid 3" / 4"

Sensor head
stainless steel

Sensor tube Ø 12
stainless steel

Product float Ø 43 x 43
stainless steel

Guard ring

Dimensions in mm

VISY-Stick Sump

The sensors for manhole and dispenser sumps based on the magnetostrictive measuring principle

The VISY-Stick Sump sensors are used to monitor the manhole sump and the sump underneath the dispenser for fluids that could potentially accumulate there. They are capable of distinguishing between water and fuel rapidly and accurately.

VISY-Stick Sump
(blue for manhole sump,
red for dispenser sump)
and the VISY-Stick Sump
installation kit

Function description

The VISY-Stick Sump sensor operates in accordance with the magnetostrictive measuring principle. The probe tube contains a wire made of magnetostrictive material. Magnets integrated in the floats magnetise the wire at the float position.

The sensor electronics transmit current pulses through the wire, which generate a circular magnetic field. A torsional wave develops at the point where the two magnetic fields overlap and it propagates towards the probe head. In the probe head, these waves are converted into an electrical signal. The float positions are calculated from the different propagation times. When necessary the water level, fuel alarm or tamper alarm are reported.

Features of the FAFNIR technology

- Continuous monitoring of the water or fuel level in the manhole sump and dispenser sump
- Alarm in the event of fuel and / or water being detected
- Encapsulated design for protection against contamination
- Anti-Tamper device

Technical data
VISY-Stick Sump

Standard version

» Product:
Accuracy ± 1 mm;
Repeatability ± 0.1 mm;
Resolution only
generating an alarm;
Response threshold
35 mm over water*;
Float Ø 54 mm

» Water:
Accuracy ± 2 mm;
Repeatability ± 0.5 mm

» Resolution 1 mm;
Response threshold 66 mm*;
Float Ø 54 mm

* Product density and the position of the
other float may result in variations

» Temperature:
Measuring range
– 40 °C to + 85°C;
Accuracy ± 1 °C;
Repeatability ± 0.5 °C;
Resolution 0.1 °C

» Electrical connection:
M12 Plug connector

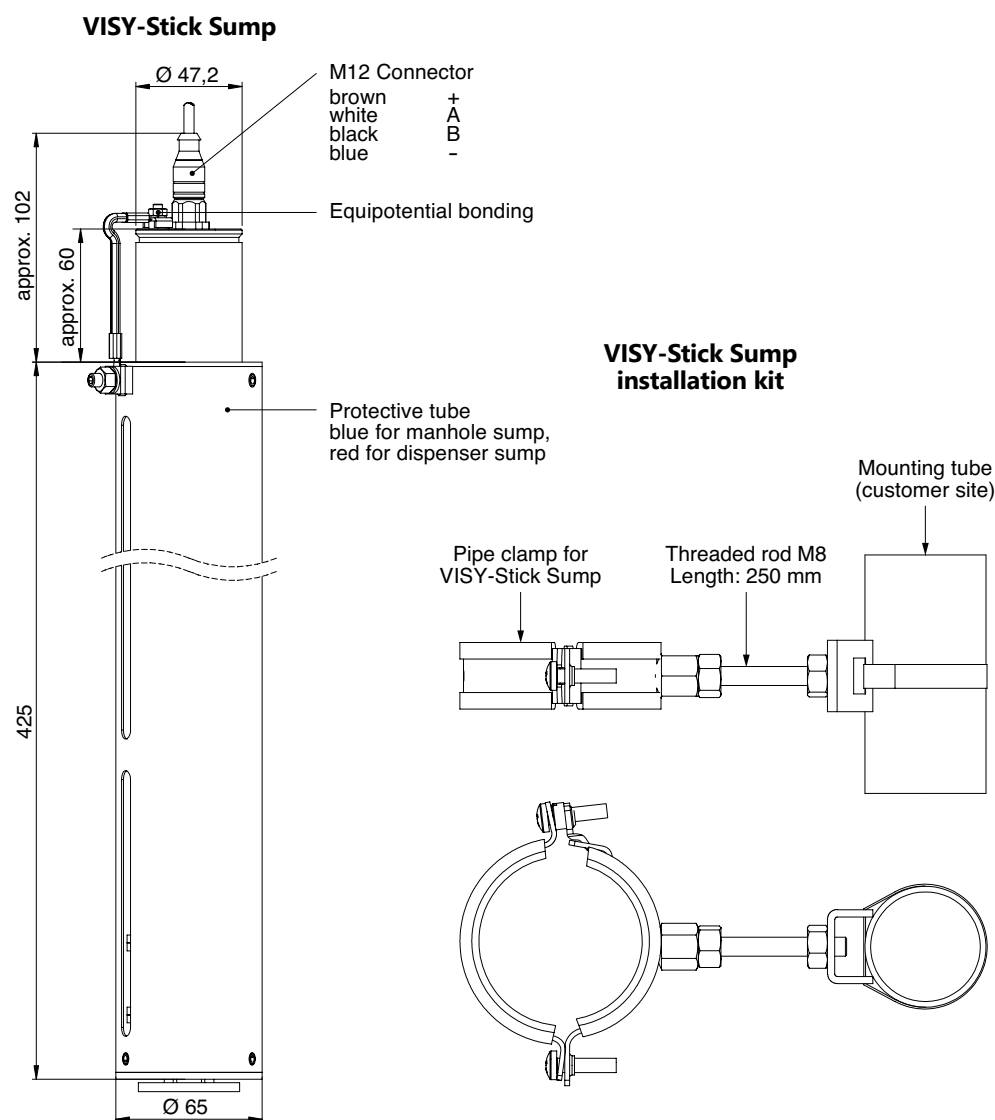» Casing protection: IP68

» Sensor material:
Stainless steel, aluminium,
plastic

» Approvals: ATEX, NEPSI, IECEx,
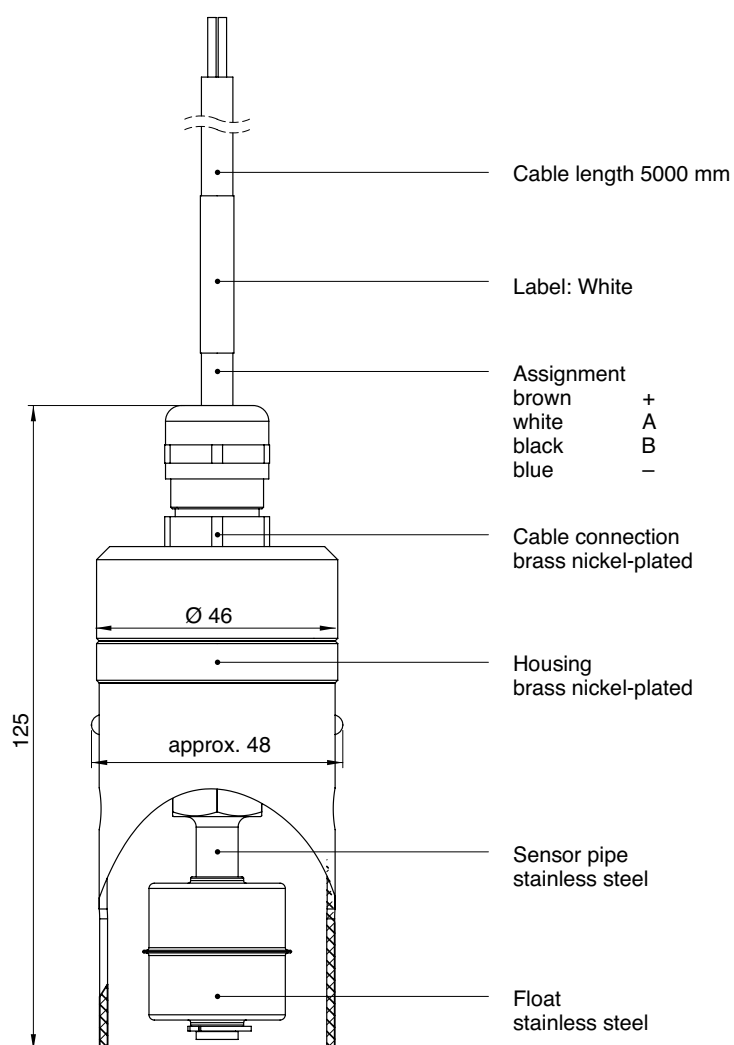UL-Brazil

Options
» Installation kit

VISY-Stick Sump

VISY-Stick Sump

Ø 47,2

approx. 102

approx. 60

425

Ø 65

M12 Connector
brown   +
white   A
black   B
blue   –

Equipotential bonding

Protective tube
blue for manhole sump,
red for dispenser sump

**VISY-Stick Sump
installation kit**

Mounting tube
(customer site)

Pipe clamp for
VISY-Stick Sump

Threaded rod M8
Length: 250 mm

Dimensions in mm

VISY-Reed Interstitial Dry

**The leak detection sensor for
double-walled tanks with reed switch**

VISY-Reed Interstitial sensors detect liquids in the intermediate chamber of double-walled tanks. The level of the liquid is monitored and an alarm will be released when the threshold has been passed.

VISY-Reed Interstitial Dry

Function description

VISY-Reed Interstitial sensors combine simple float switches based on reed contacts with the VISY-Sensor interface for connection to the VISY-Command.

The float follows the level of the liquid as it rises, and a magnet opens a reed switch inside the sensor tube. This alarm message is transmitted directly

to VISY-Command. Thanks to the low power input, VISY-Reed sensors of different types can be operated parallel to a VISY-Stick.

Features of the FAFNIR technology

- Solid design
- Housing made of brass nickel-plated, float made of stainless steel
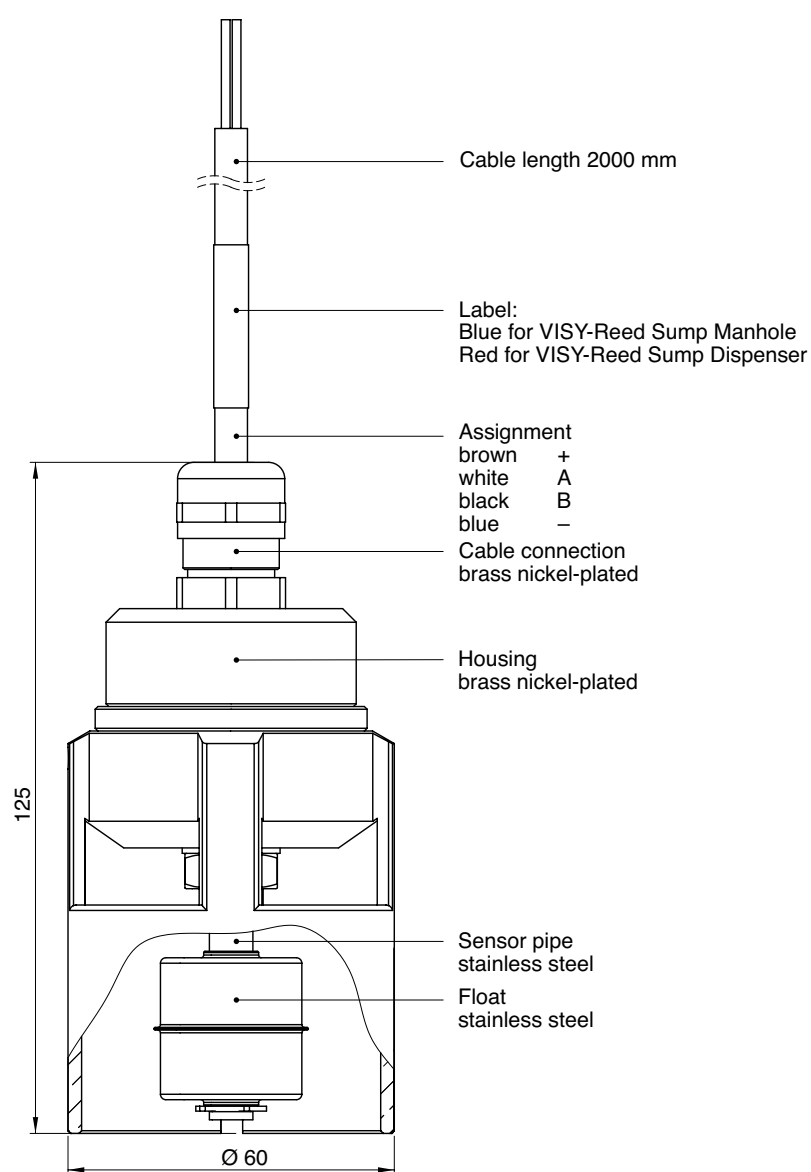- No additional cable required due to operation on the VISY-Sensor bus parallel to VISY-Stick and VISY-Reed Sump
- Response threshold at ca. 30 mm

Technical data
VISY-Reed Interstitial Dry

» **Product:**
Response threshold fuel:
approx. 35 mm;
Response threshold water:
approx. 30 mm
» **Float:**
Stainless steel Ø 26 mm

» **Electrical connection:**
4-wire cable
» **Casing protection:** IP68
» **Sensor material:** Stainless steel, brass nickel-plated
» **Approvals:** ATEX, IECEx, NEPSI, UL-Brazil

VISY-Reed Interstitial Dry

Cable length 5000 mm

Label: White

Assignment
brown   +
white   A
black   B
blue   –

Cable connection
brass nickel-plated

Ø 46

Housing
brass nickel-plated

125

approx. 48

Sensor pipe
stainless steel

Float
stainless steel

Dimensions in mm

VISY-Reed Sump

The sensors for manhole and dispenser sumps with reed switches

VISY-Reed Sump sensors detect liquids in the manhole sump and under the fuel dispensers. The level of the liquid is monitored and an alarm will be released when the threshold has been passed.

VISY-Reed sensors are a low-cost solution for easy and reliable detection of liquids.

VISY-Reed Sump
blue for the manhole sump
red for the dispenser sump

Function description

VISY-Reed Interstitial sensors combine simple float switches based on reed contacts with the VISY-Sensor interface for connection to the VISY-Command. The float follows the level of the liquid as it rises, and a magnet opens a reed switch inside the sensor tube. This alarm message is transmitted directly to VISY-Command. Thanks to the low power input, VISY-Reed sensors of different types can be operated parallel to a VISY-Stick.

Features of the FAFNIR technology

- Solid, stable design
- Housing made of brass nickel-plated, float made of stainless steel

- No additional cable required due to operation on the

VISY-Sensor bus parallel to VISY-Stick and VISY-Reed Sump

Technical data
VISY-Reed Sump

» Product:
  Response threshold fuel
  approx. 35 mm;
  Response threshold water
  approx. 30 mm;
  Float stainless steel
  Ø 26 mm

» Electrical connection:
  4-wire cable
» Casing protection: IP68
» Sensor material:
  Stainless steel,
  brass nickel-plated
» Approvals: ATEX, IECEx,
  NEPSI, UL-Brazil

VISY-Reed Sump

Cable length 2000 mm

Label:
Blue for VISY-Reed Sump Manhole
Red for VISY-Reed Sump Dispenser

Assignment
brown   +
white   A
black   B
blue   –
Cable connection
brass nickel-plated

Housing
brass nickel-plated

125

Sensor pipe
stainless steel

Float
stainless steel

Ø 60

Dimensions in mm

VISY-Command

The control unit

**The control unit
VISY-Command**

VISY-Command contains the intrinsically safe power supply for the VISY-Stick sensors and their control unit. Various interfaces ensure that it always has access to the latest data.

Features of the FAFNIR technology

- Up to 3 different VISY sensors can be connected to one terminal by a common cable
- Highly flexible thanks to modular architecture
- Easy to upgrade and retrofit
- IFSF-LON compatible

- Easy to configure thanks to free VISY-Setup software application
- Easy start-up
- The current firmware will be provided free of charge throughout the entire product life cycle (on request).

- Communication via Ethernet possible
- Free, user-friendly software for firmware updates
- Wireless communication of VISY-Command RF with VISY-Stick Sensors

Function description

The VISY-Command control unit has a modular architecture. The internal components are modules for DIN rail installation that can be retrofitted or converted at any time. VISY-Command is available in the form of basic versions VISY-Command 8 and 16, i. e. with either 2 / 4 / 8 or 16 sensor connections. Up to 3 different sensors (e. g. VISY-Stick, VISY-Stick Interstitial and VISY-Stick Sump) can be connected to one terminal by a common cable.

The control unit is also available in the form of VISY-Command RF; this supports the wireless operation of up to 16 VISY-Stick sensors.

VISY-Command provides an intrinsically safe power supply for the VISY-Stick sensors. The measured values supplied are prepared in such a way that all of the latest measurement data can be viewed at any time on a superordinate system (e. g. cash system, petrol station controller, VISY-Monitor PC software …) connected to a serial port. Data transmission is supported by various, common data protocols, e. g. Ethernet and IFSF-LON.

The extension interface of VISY-Command enables multiple external VISY-View Touch displays (e.g. fuel tanker display and local display in the office) to be connected and positioned where they can be seen and operated by personnel at all times. VISY-Command itself can be fitted in a location that achieves the most cost-effective cabling arrangement (e.g. power distribution unit or basement). By contrast with systems having an integrated display, the major advantage of our system is that it is not necessary to have all of the sensor cabling routed though the building to the viewing point (e.g. the office).

The optional VISY-ICI 485 interface makes it possible to connect multiple VISY-Input/-Output units. These enable the inputting (VISY-Input) of additional external alarms (e.g. oil separators) and/or the outputting (VISY-Output) of alarms by way of relay contacts.

VISY-Command is configured using the VISY-Setup software application through the separate serial service port. As a result, practically all maintenance and diagnostics tasks can be carried out while the entire system is still in operation. It is not necessary to switch off individual components: petrol station operations are not affected. VISY-Setup is free of charge and, in addition to offering user-friendly and efficient direct configuration by notebook, it also supports remote servicing via a modem or serial-to-Ethernet converter.

Design

	VISY-Command	
Housing	up to 8 sensor terminals and RF version: H 300 x W 300 x D 125 [mm]	16 sensor terminals: H 300 x W 400 x D 175 [mm]
Casing protection	IP20	
Weight	5.7 kg	9.7 kg
Ambient temperature	0 °C to + 40 °C	
Supply	230 V_{AC} ± 10 %, approx. 15 VA or 23 VA (VISY-Command 16)	
Internal display	7-segment status indicator	
Number of sensor terminals	2, 4 or 8	16
Host interface (RS232 / RS485) – **IFSF-LON module** – **Ethernet module (MoxaNPort5110)** **for long distance scanning** – **Modem for long distance scanning**	standard optional [1] optional [1] optional [1]	
Service interface (RS232) – **Modem for long distance scanning** – **Ethernet module (MoxaNPort5110)** **for long distance scanning**	standard optional [1] optional [1]	
Extension interface (RS485) – **VISY-View Touch display**	standard optional [2]	
VISY-ICI 485 module – **VISY-Output (relay outputs)** – **VISY-Input (digital switch inputs)**	optional optional [2] optional [2]	
Printer	optional [3] (external)*	

* only in connection with VISY-View Touch

Functions

	VISY-Command
Communication with the PoS / BOS system or petrol station controller	standard
Automatic filler recognition	standard
Automatic tank calibration	optional [4]
Loss / leak monitoring	standard [5]
Stock, filling and alarm histories	standard [5]

(1) Alternatively, one of the available options can be used at the interface concerned.

(2) Multiple available options can be used simultaneously at the interface concerned.

(3) In conjunction with VISY-View Touch.

(4) In conjunction with VISY-Monitor and a compatible cash system/ automatic fuel dispenser.

(5) In conjunction with VISY-Monitor.

VISY-Command GUI

The control unit with a graphic display

VISY-Command GUI with printer

- Instant alarm message via e-mail
- Daily report via e-mail
- Static leak detection

VISY-Command GUI contains the intrinsically safe power supply for the VISY-Stick sensors and their control unit. Various interfaces ensure that it always has access to the latest data. The integrated display unit with the 5.7" colour touch screen provides and displays the current measurement values and the reporting functions (log file) in a user-friendly form. The VISY-Command GUI has a display with a clearly structured and easy to operate interface. The most important information, e.g. tank level and alarms are displayed directly and up-to-date on the screen. Using the touch screen, operators can call up detailed information simply by touching the tank graphics or the function keys.

Features of the FAFNIR technology

- Up to 3 different sensors can be connected to one terminal by a common cable.
- Up-to date overview of the tank contents shown at a graphic display
- Convenient tank content visualization with useful additional data, e.g. ullage

- Display of the tank contents in litres, with or without temperature compensation
- Display of product temperature and water level
- Highly flexible due to modular architecture
- Easy to upgrade and retrofit
- Precise configuration using the free software VISY-Setup

- Easy start-up
- Communication via Ethernet possible
- Free, user-friendly software for firmware updates
- Integrated alarm signal
- Wireless communication of VISY-Command GUI RF with VISY-Stick Sensors
- Optional with printer

Function

The display of the VISY-Command GUI visualises the data provided by the FAFNIR sensors. All of the relevant data related to the tank (tank number and product name), the product (level, water level and product temperature) and various additional data (e.g. ullage) are displayed. The tank information displayed is continuously refreshed and viewable at all times. Fuel deliveries and tank alarms are archived additionally in a database.

The display board is operated by a touch screen.
Special attention was given to ergonomics when determining the size of the function keys.

If required, all of the displayed tank information can be printed out using the integrated printer (option). Moreover, obligatory print-outs for alarm messages are possible. An audio warning sounds in addition to tank alarms.

Data Management

» Volumetric display of tank contents
» Temperature-compensated volume
» Product temperature
» Ullage
» Tank and product name
» Water level
» Variable number of displayed tanks (16 tanks maximum)
» Alarm messages and logging
» History records (delivery data and alarms)
» Archiving of delivery data and alarms in a database

Design

|	VISY-Command GUI	
Housing	Up to 8 sensor terminals: H 300 x W 300 x D 175 [mm]	16 sensor terminals: H 300 x W 400 x D 175 [mm]
Casing protection	IP20	
Weight	6.7 kg	10.7 kg
Ambient temperature	0 °C to +40 °C	
Supply	230 V_{AC} ± 10 %, approx. 50 VA	
Internal display	5.7" TFT touch screen	
Number of sensor terminals	2, 4 or 8	16
Host interface (RS232 / RS485) – Ethernet module (MoxaNPort5110) for long distance scanning – Modem for long distance scanning	standard optional optional	
Service interface (RS232) – Modem for long distance scanning	standard optional	
Extension interface (RS485) – VISY-View Touch display	standard optional	
VISY-ICI 485 module – VISY-Output (relay outputs) – VISY-Input (digital switch inputs)	optional optional optional	
Printer	optional	

Functions

	VISY-Command GUI
Communication with the PoS / BOS system or petrol station controller	standard
Automatic filler recognition	standard
Static leak detection	standard

VISY-RF

The wireless solution for VISY-X

VISY-Command RF
VISY-Command GUI RF
External antenna
VISY-RFT module

The VISY-X tank gauging system can also be operated wirelessly. The VISY-RFT module (radio frequency transmitter) mounted in the manhole, transmits the tank data recorded by the VISY-Stick sensors and the data of the environmental sensors wirelessly to the VISY-Command RF control unit. The control unit includes the VISY-RFR module (radio frequency receiver) to which 2 optional available antennas can be connected.

Features of the FAFNIR technology

- Compatible with all VISY-X components
- Long battery life
- High level of data availability
- Simple to install and configure

Application

VISY-RF is used wherever the routing of cables is unfeasible, or would be too cost-intensive.

The wireless system proves beneficial in this scenario because no excavation work is required.

The wireless system is suitable for all above-ground and underground storage tanks.

Design

	VISY-Command RF / VISY-Command GUI RF
Housing	up to 16 measuring sensors H 300 x W 300 x D 125 / 175 [mm]
Casing protection	IP20
Weight	6.7 kg
Ambient temperature	0 °C to + 40 °C
Supply	230 V_{AC} ± 10 %, approx. 50 VA
Internal display	5.7" TFT touch screen
Number of measuring sensors	16 per sensor type
Host interface (RS232 / RS485) **– Ethernet module (MoxaNPort5110)** ** for long distance scanning** **– Modem for long distance scanning**	standard optional optional
Service interface (RS232) **– Modem for long distance scanning**	standard optional
Extension interface (RS485) **– VISY-View Touch display**	standard optional
VISY-ICI 485 module **– VISY-Output (relay outputs)** **– VISY-Input (digital switch inputs)**	optional optional optional
Printer	optional

	VISY-RFT module
Housing	H 82* x W 80 x D 55 [mm]
Casing protection	IP67
Ambient temperature	– 20 °C to + 60 °C
Transmission frequency:	433 MHz
Transmission range (line of sight)	max. 250 m
Battery operating time:	8 years at 5-minute transmission intervals; 4 years at 1-minute transmission intervals

(without cable glands and antenna)

Functions

	VISY-Command GUI RF
Communication with the PoS / BOS system or petrol station controller	standard
Automatic filler recognition	standard
Static leak detection	standard

VPI

VISY-Power Interface
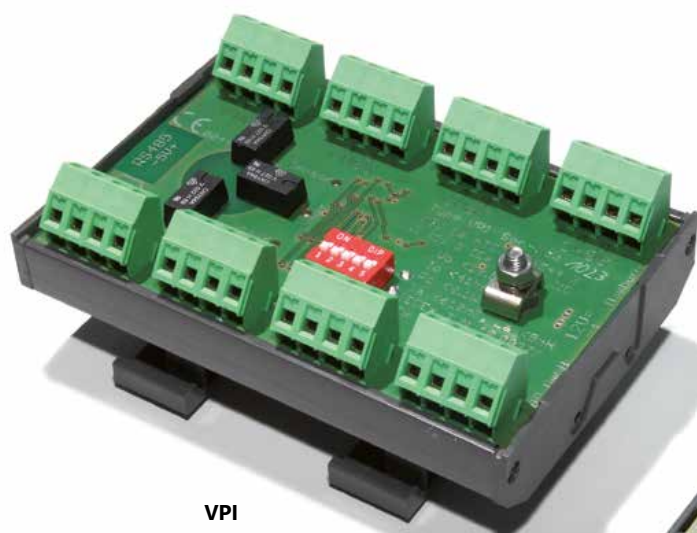
VPI
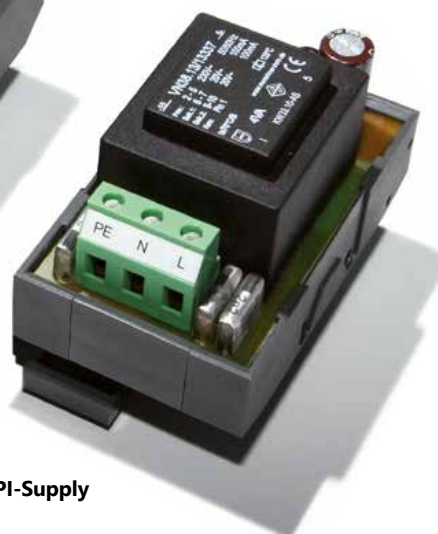
VPI-Supply

The VPI (VISY-Power Interface) provides a communications interface between the sensors and a higher-level system (master).
For the sending of commands to the sensors, the VPI supports two protocols*. The response is assigned and forwarded to the individual sensor terminals.

Up to 1,024 sensors can be connected to 32 VPIs. The sensors require a connection to the VPI. The installation location for the VPI must be outside the potentially explosive atmosphere.
The VPI is designed for DIN carrier rail installation and has eight intrinsically safe sensor terminals.

Up to 32 VPIs can be circuited in parallel, depending on the quantity of sensors to be connected.

* The following protocols are supported:
  1. FAFNIR Universal Device Protocol (UDP)
  2. H-Protocol

Features of the FAFNIR technology

- 8 intrinsically safe sensor terminals per VPI
- Connection of max. 32 VPIs in parallel possible = 256 sensor terminals
- One sensor terminal supports the connection of up to 4 different VISY sensors

- Intrinsically safe power supply
- Passive communication via RS485
- Supply to VPI by commercially available power supply unit possible

- Two VPIs can be connected to one FAFNIR VPI-Supply (power supply unit)
- Easy DIN mounting rail installation, no additional enclosure required
- Maintenance-free

VISY-View Touch

Visualization for the Automatic Tank Gauging System VISY-X

VISY-View Touch

- Instant alarm message via e-mail
- Daily report via e-mail
- Static leak detection

Application

VISY-View Touch is a display for use with the tank gauging system VISY-X. It is a visualisation and working platform for tank contents at petrol stations and provides a convenient overview of the installed level and environmental sensors. The VISY-View Touch display module is used wherever no petrol station cash system is available, cannot or should not be used for viewing tank content data. In addition, it is particularly useful to the fuel tanker driver, who will be able to read tank levels before refuelling the petrol station.

Features of the FAFNIR technology

- Permanent overview of tank contents at the petrol station
- User-friendly tank content viewer with a useful range of additional information
- Tank contents displayed in litres or gallons

- Display of product temperature and water level
- Communication with the VISY-Command control unit
- Optional printer connection
- Display of various historical data
- Free, user-friendly software for firmware updates

- Ability to connect multiple VISY-View displays if necessary
- Also usable as display for fuel tanker*

* with USB input module

Product Features

The tank content
visualization encloses:
» Display of tank contents in
   litres
» Product temperature
» Temperature-compensated
   volume
» Ullage
» Tank and product name
» Water level
» Alarms for water and
   product
» Delivery history for all tanks
» Alarms for environmental
   sensors
» Additional information with
   wireless version
» Static leak detection

Technical data
VISY-View Touch

» Housing dimensions:
   H 205 x W 230 x D 80 [mm]
» Display:
   Embedded microcomputer
   with 5.7" colour touchscreen
   and VISY-SoftView
   application software
» Plug-in power supply: 12 V_{DC}
» Ambient temperature:
   0 °C to + 40 °C
» 1 x RS485
   communication interface
   with VISY-Command
» 1 x RS232
   communication interface
   e. g. with a printer
» Casing protection: IP20

Package contents:

» Display
» Plug-in power supply

Accessories:

» Thermal transfer printer
» Table stand
» USB input module

**VISY-View
table stand**

Printer

FAFNIR™

The printer for
VISY-View Touch
(available in the colours
white and black)

Application
Optionally, it is possible to connect the printer to VISY-View Touch to print out current tank contents, delivery data and alarms.

Technical data
Printer
» Case dimensions:
  H 90 x W 100 x D 191 [mm]
» Ambient temperature:
  0 °C to + 40 °C
» Power supply:
  100 to 240 V_{AC}, 50 to 60 Hz,
  via AC / DC adapter
» Printing method:
  Thermal line printing

» Paper changing:
  Easy paper drop in
» Paper width: 58 mm ± 0.5 mm
» Paper roll diameter:
  max. 60 mm
» Communication:
  RS-232 connection to
  VISY-View Touch

VISY-Input

Input module for external alarms

**Input module
VISY-Input**

Application

VISY-Input is an octal input module installed in a splash proofed case with protection class IP66. It connects external alarm outputs to the VISY-X high-precision tank gauging system.

For a central logging alarms detected by external systems can be forwarded to the VISY-X tank gauging system via VISY-Input. This allows the indication of alarms from different systems at one central point. To connect to the VISY-X tank gauging system only a low-cost communication cable has to be laid.

Features of the FAFNIR technology

- Flexible installation
- Cost-effective connection to VISY-X

- Easy to configure using VISY-Setup
- External alarms displayed centrally by VISY-X

- Clear LED status indicators
- Ability to connect up to eight VISY-Input modules to VISY-X

Technical data
VISY-Input

» Housing dimensions:
  H 130 x W 180 x D 60 [mm]
  (excluding cable connections)
» Ambient temperature:
  0 °C to + 40 °C
» Casing protection: IP66
» Communication:
  1 x RS485 (connection
  to VISY-Command
  via VISY-ICI 485 module)

» LEDs:
  2 x power LED,
  1 x status LED,
  2 x communication LED,
  8 x input LED
» Inputs:
  8 inputs, which can be
  configured either as potential-
  free voltage inputs or as
  inputs for relay contacts

» Voltage inputs:
  input voltage range
  5 V_{DC} (appr. 1 mA) to 24 V_{DC}
  (appr. 7 mA), potential-free,
  protected against polarity
  reversal
» Relay inputs: internal
  power supply 12V_{DC},
  relay contact current
  appr. 10 mA
» Power supply:
  230 V_{AC} ± 10 %, 50 to 60 Hz,
  ≤ 4 VA
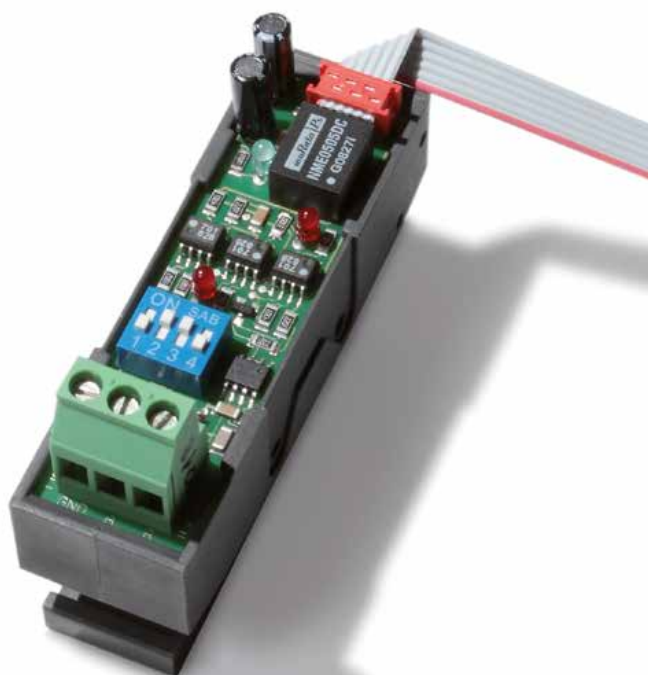
**ICI-485 module
required to connect
VISY-Input / VISY-Output**

VISY-Output

Relay output module
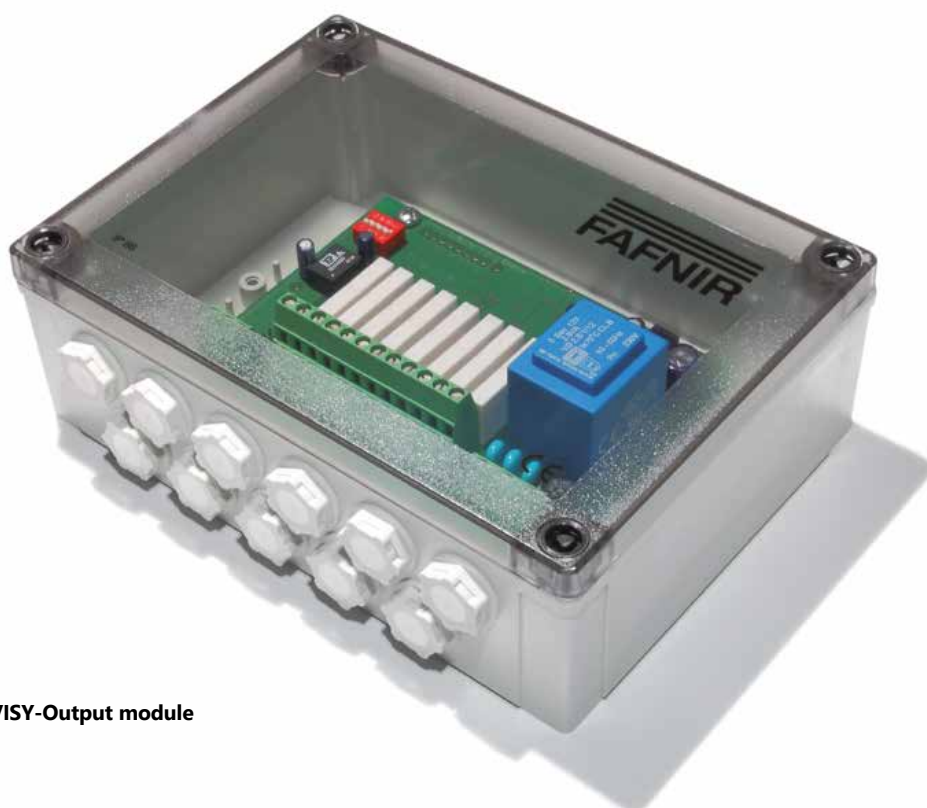
VISY-Output module

Application

VISY-Output is an eight relays output module installed in a splash proofed case with protection class IP66. It connects external safety devices or alarm indicators to the VISY-X high-precision tank gauging system. Alarms, by the tank gauging system VISY-X detected, can freely be assigned to each single relay.

To connect to the VISY-X tank gauging system only a low-cost communication cable has to be laid.

Features of the FAFNIR technology

- Flexible installation
- Cost-effective connection to VISY-X

- Easy to configure using VISY-Setup
- Switching of external safety devices or alarm indicators by freely programmable relays
- Clear LED status indicators

- Ability to connect up to eight VISY-Output modules to VISY-X

Edition 05.2016   Technical changes reserved

Technical data
VISY-Output

» Housing dimensions:
  H 130 x W 180 x D 60 [mm]
  (excluding cable connections)
» Ambient temperature:
  0 °C to + 40 °C
» Casing protection: IP66
» Communication:
  1 x RS485 (connection
  to VISY-Command
  via VISY-ICI 485 module)

» LEDs:
  1 x power LED,
  1 x status LED,
  8 x alarm LED,
  8 x relay LED
» Power supply:
  230 V_{AC} ± 10 %,
  50 Hz to 60 Hz, ≤ 4 VA

» Outputs:
  8 x relays each with one
  potential-free changeover
  contact;
  load rating of the contacts:
  AC voltage:
  U_{eff} ≤ 250 V, cos ϕ ≥ 0,7,
  I_{eff} ≤ 3 A, P_{eff} ≤ 300 VA;
  DC voltage:
  U ≤ 24 V, I ≤ 2 A, P ≤ 50 W

**ICI-485 module
required to connect
VISY-Input / VISY-Output**

VISY-Monitor

Software Application
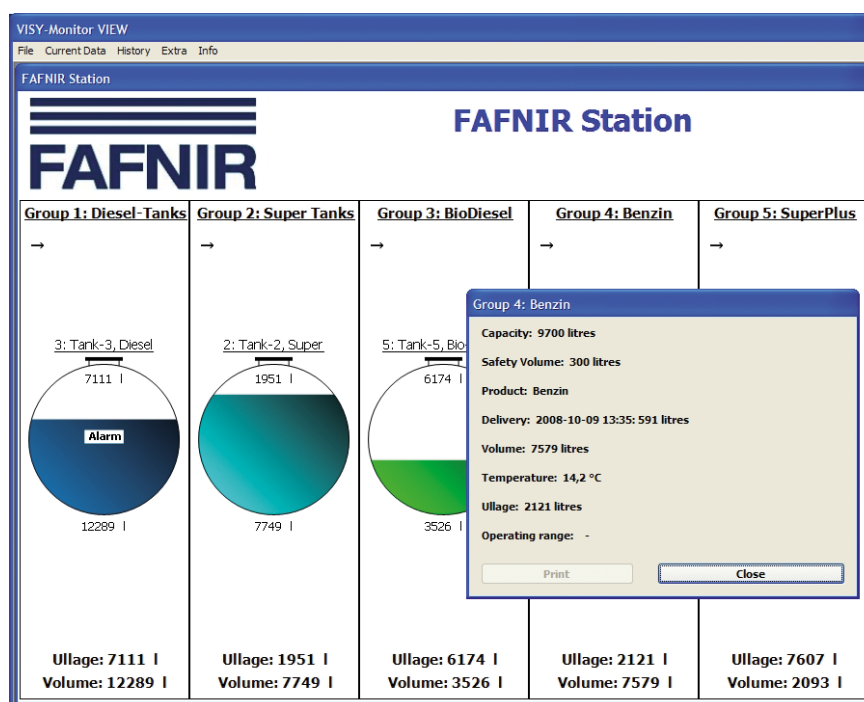
**The VISY-Monitor
software application**

VISY-Monitor is a software application for monitoring and recording data from tanks at petrol stations, fuel depots, etc.

It displays the tank data and serves as a working platform for the tank data at petrol stations.

Features of the FAFNIR technology

- Permanent overview of tank contents by graphical representation
- Convenient tank content visualization with useful additional data, e.g. ullage
- Tank contents displayed in litres or gallons
- Display of product temperature and water level

- Clearly presented numerical and graphical representation of historical data
- Automatic tank calibration
- Reconcilliation
- Automatic leakage monitoring
- Automatic tank mapping
- Static and dynamic leakage monitoring
- Communication with the VISY-Command control unit

- Connection to the VISY-Tank resource management software application via Ethernet
- Three separate channels for connection to different tank gauging systems
- Supports the most common tank gauging systems
- Runs on Windows NT / 2000 / XP / Vista / Win7

Function

VISY-Monitor displays a fully comprehensive range of tank data. The filling level data from the VISY-X system (VISY-Stick and VISY-Command) are forwarded to the PC and displayed by the VISY-Monitor software application. VISY-Monitor supports different types of tank data, including all relevant data about the tank (tank number and content) and the product (filling level, water level and product temperature) as well as additional information (e.g. ullage). The tank information displayed is continuously refreshed and viewable at all times. In addition, VISY-Monitor offers a wide range of other features, such as automatic tank calibration, optimum leakage monitoring and the ability to display historical data. Historical data are displayed in tabular and graphical form and can be printed out. All inventory and event data are stored indefinitely in a database for further processing.

It is also possible to connect an external journal printer for documenting current tank levels and enabling mandatory printouts of all alarm messages. For audible alarms, it is a simple matter of connecting up to a standard audio system.

In addition to FAFNIR sensors, two further tank gauging systems from the most common manufacturers can be connected in parallel, which means that existing sensors can be replaced in stages.

Data Management

» Volumetric representation of tank contents
» Temperature-compensated volume
» Product temperature
» Ullage
» Tank and product name
» Water level
» Variable number of displayed tanks
» Alarm messages and logging
» Automatic tank calibration
» Reconciliation
» Automatic loss and leakage monitoring
» History logging
» All data stored in a database

System requirements

» CPU 700 MHz
» RAM 512 MB
» Spare hard drive capacity for VISY-Monitor software application: 30 MB
» Windows 2000 Professional with SP4, Windows XP Professional with SP2 or Windows Vista with SP1, Win 7 (32 bit)
» Microsoft.NET 2.0 Framework
» 2 x RS 232 ComPort
  – to connect VISY-Command
 – to connect to PoS (no USB-To-Serial Adapter)

Accessories

1" Installation Kit

The optional installation kit comprises a product float, a water float and a screw-in unit. It makes it possible to install a VISY-Stick using an G 1 threaded coupler. The screw-in unit is also available in stainless steel.

1" Installation Kit

1" Installation Kit

WAF 41

Screw-in unit R 1
brass or stainless steel

G 1

55

18

Ø 29,5

40

Product and
water float
stainless steel
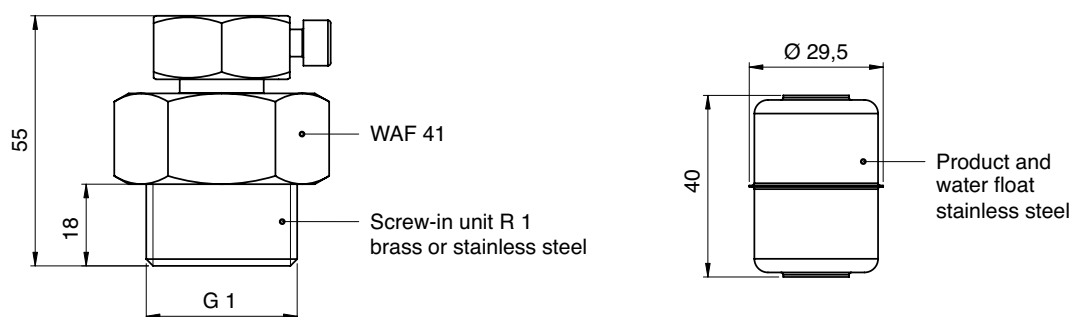
Dimensions in mm

VISY-RFT installation kit
Installation kit
for mounting
a VISY-RFT module.

RFT-Battery
Battery for the
VISY-RFT module

Antenna cable
50 ohm coaxial
cable for connecting
external antennas to
VISY-Command (GUI) RF,
low attenuation

BNC Connector set
consisting of:
2 x BNC plug
1 x BNC-F adapter

External antenna
For connection to the
VISY-Command (GUI) RF.

RF-Meter
The RF meter measures
the radio field strength
for a comfortable start-
up of VISY-RF.

Connection cable M12
The blue, fuel-resistant
installation and connection
cables are two metres
long, 4-wire and available
in two versions:
straight and 90° elbow.

VISY-Connecting cable
Cable for VISY-X
installations:
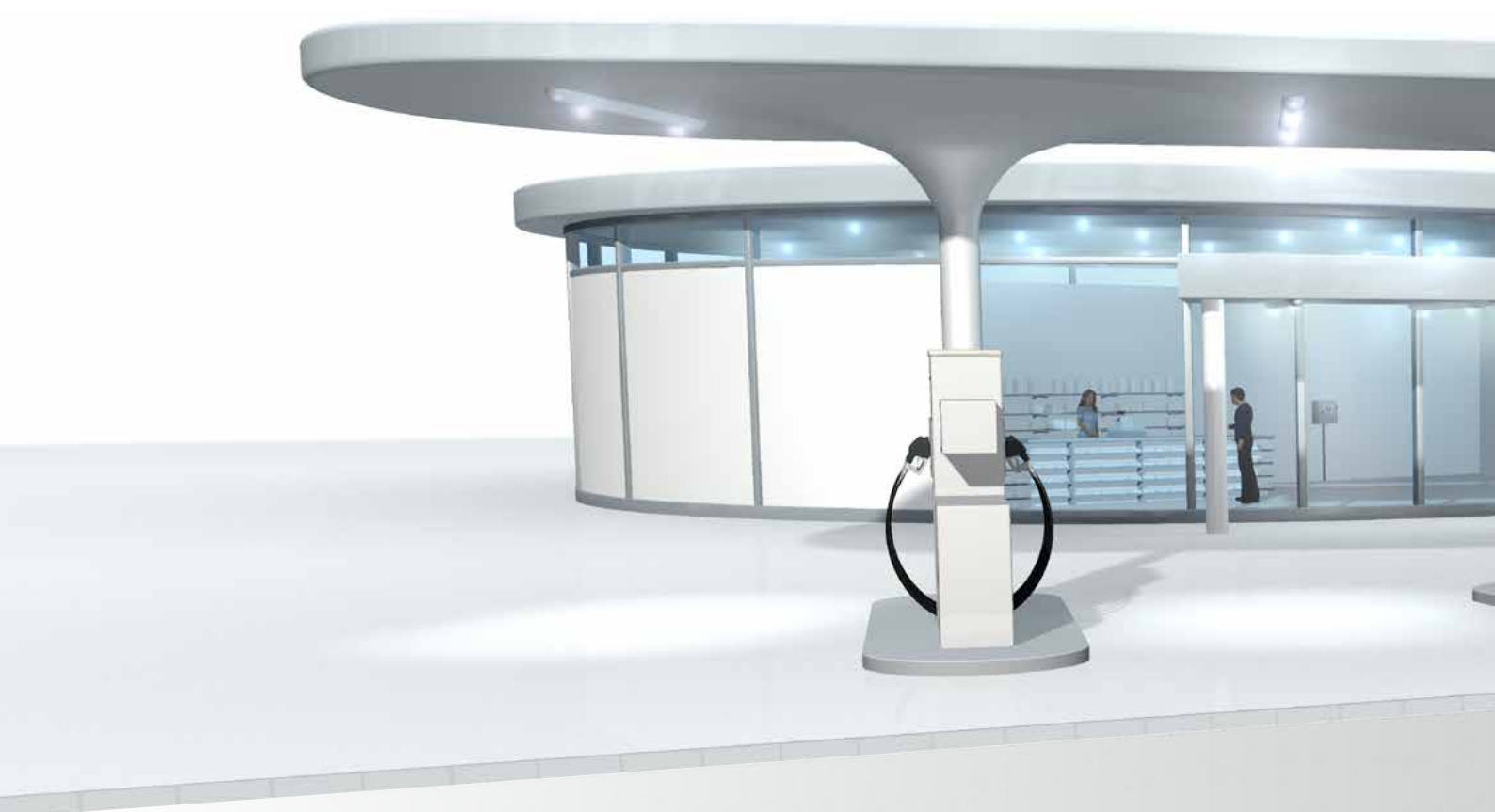4 x 0,75 mm², blue,
fuel resistant

Junction Tube
The 5-pin cable coupler makes
it quick and easy to establish
the connection between the
VISY-Stick and the cable to
the VISY-Command.

1" LPG float
Optional available
instead of the
standard LPG float