

# VAPORIX

## VAPORIX-Flow and VAPORIX-Control



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## 1 Properties of the VAPORIX system

The VAPORIX system (vapor recovery information system) is an automatic monitoring device to check the function of the vapor recovery systems (Stage II) at filling stations. The VAPORIX system is approved in compliance with the German 21<sup>th</sup> Federal Immission Control Ordinance (BImSchV) and the European Directives 2009/126/EC and 2014/99/EU.

During the fuelling process the vapour flow is registered together with the fuel flow of the according fuelling point. The fuel flow data is taken over from the pulse outputs of the dispenser computer. After the fuelling process has been completed, an evaluation is performed and the status of the vapour recovery system is signalled with two LEDs.

A VAPORIX system consists of two VAPORIX-Flow transmitters for monitoring both sides of the dispenser and one evaluation unit VAPORIX-Control. The VAPORIX-Flow transmitter is fitted into the vapour recovery pipe. The evaluation unit VAPORIX-Control is mounted in the computer head of the dispenser. The transmitters, pulse inputs and auxiliary power supply are connected to the evaluation unit. Finally, the maintenance-free system must be configured.

In addition, the evaluation unit can be extended by the following VAPORIX components:

- SECON with SECON-Vap  
Signalling device to indicate the function status of the vapour recovery and the VAPORIX system (displays faults, saves and acknowledges);  
(see technical documentation SECON Client, art. no. 350076;  
technical documentation SECON-Vap User guide, art. no. 350113; and technical documentation SECON-Vap Administrator, art. no. 350134)
- VAPORIX-PCM  
Module for corrective control of active vapour recovery systems  
(see technical documentation VAPORIX-PCM, art. no. 350102)
- VAPORIX-Service-Dongle  
Access protection, user identification, and ease of service functions of the VAPORIX system  
(see technical documentation VAPORIX-Service-Dongle, art. no. 207082)
- VAPORIX-Diagnostic  
Excel-based program for automatic reading and graphical representation of the VAPORIX history data of both dispenser sides  
(see technical documentation VAPORIX-Diagnostic, art. no. 207155)

## 2 Safety instructions

The VAPORIX system is designed for measuring and evaluating the vapour flow of vapour recovery systems at petrol stations. The system must be used exclusively for this purpose. The manufacturer accepts no liability for any form of damage resulting from improper use.

The transmitter and the evaluation unit have been developed, manufactured and tested in accordance with state-of-the-art technology and with recognised safety rules and regulations. Nevertheless, hazards may arise from their use.

For this reason, the following safety instructions must be observed:

- Do not change or modify the system or add any equipment without the prior consent of the manufacturer.
- Only use original spare parts. These comply with the technical requirements specified by the manufacturer.
- The installation, operation and maintenance of the transmitter and the evaluation unit as well as configuration of the system must only be carried out by expert, authorised personnel. Specialised knowledge must be acquired by regular training.
- Operators, installers and service technicians must observe all applicable safety regulations. This also applies to any local safety and accident prevention regulations which are not stated in this user guide.
- VAPORIX-Flow and VAPORIX-Control are subject to explosion protection and environmental approvals and are therefore only allowed to be repaired by FAFNIR or companies authorized by FAFNIR. In case of failure, always the entire transmitter or the entire evaluation unit must be replaced.
- The evaluation unit VAPORIX-Control is exclusively intended for mounting in the protective casing of the dispenser computer and not to be used in hazardous areas. It is only intended for use within the VAPORIX system.

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 damages to the VAPORIX system.*



*Useful information which ensures continued and correct operation of the system and makes your work easier.*

### 3 VAPORIX-Flow transmitter

#### 3.1 Design and function

The VAPORIX-Flow is a calorimetric flow transmitter with integrated vapour concentration sensor, which supplies accurate results even in case of changing vapour concentrations.

VAPORIX-Flow consists of a measuring tube with inlet section (1), outlet section (2) and side-fitted sensor support (3) (see Figure 1).

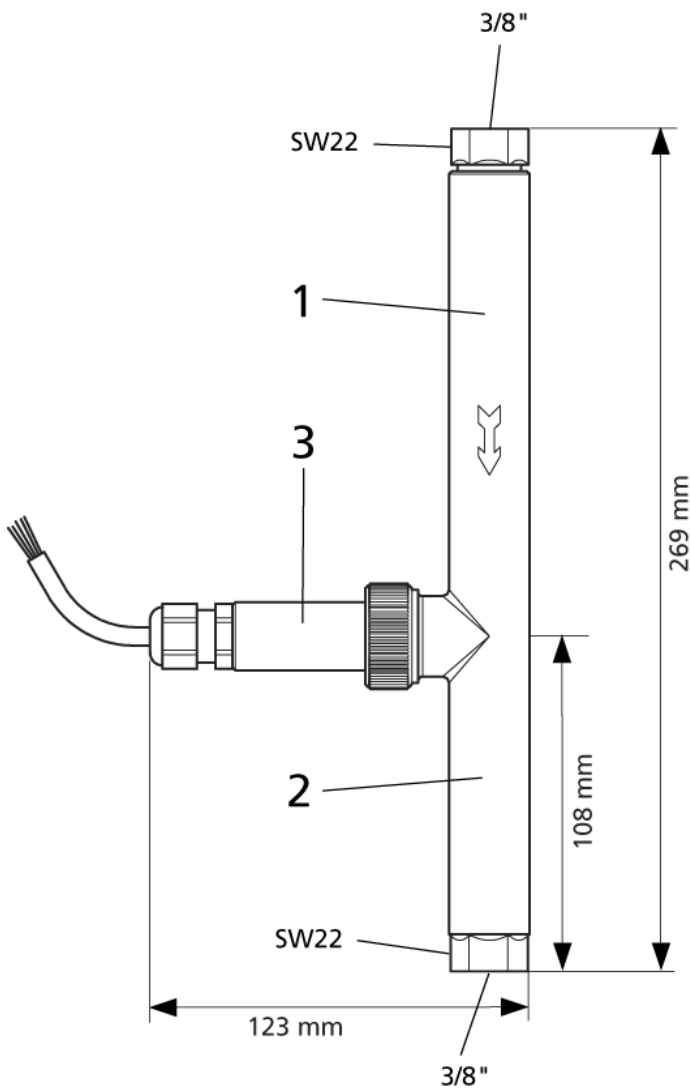


Figure 1: VAPORIX-Flow sensor

In the sensor support (3) there are three sensors. A temperature sensor to measure the vapour temperature, a heat dissipating sensor to determine the flow and a heat dissipating sensor to measure the vapour concentration.

The measurement of flow rate and vapour concentration is based on the calorimetric principle. Here, the heat dissipation of the electrically heated sensor into the flowing medium is utilized as a measuring effect. The vapour concentration is required for precise evaluation of the flow rate.

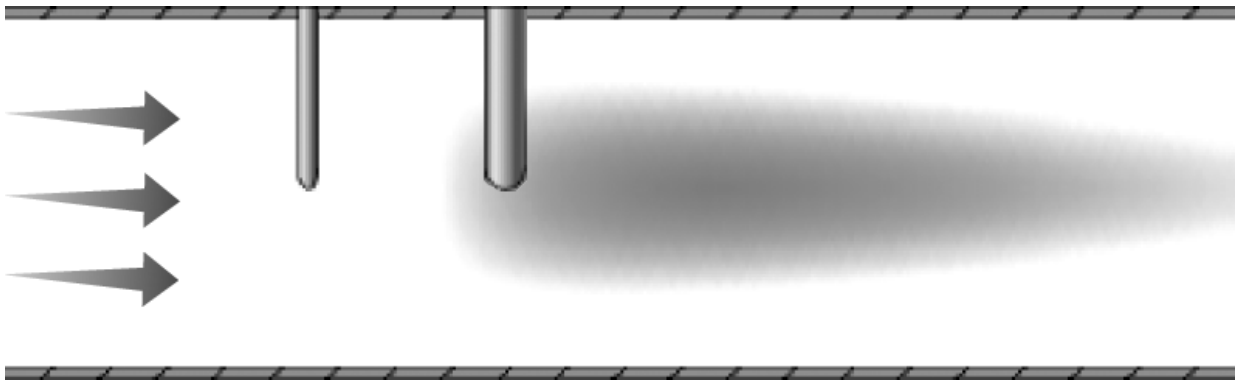





Figure 2: Function principle of the VAPORIX-Flow

The grey tail represents the heat dissipation into the flowing medium.

### 3.2 Installation

-  *When working with the transmitters, the national safety and accident prevention regulations and safety instructions in this manual must be observed.*
-  *When installing and operating the transmitters, the national requirements of Explosion Protection Regulations, Industrial Health and Safety Regulations and Equipment Safety Regulations as well as generally accepted rules of engineering and these operating instructions must be observed.*
-  *VAPORIX-Flow and VAPORIX-Control are subject to explosion protection and environmental approvals and are therefore only allowed to be repaired by FAFNIR or companies authorized by FAFNIR. In case of failure, always the complete transmitter must be replaced.*

### 3.2.1 Installation of VAPORIX-Flow in the dispenser

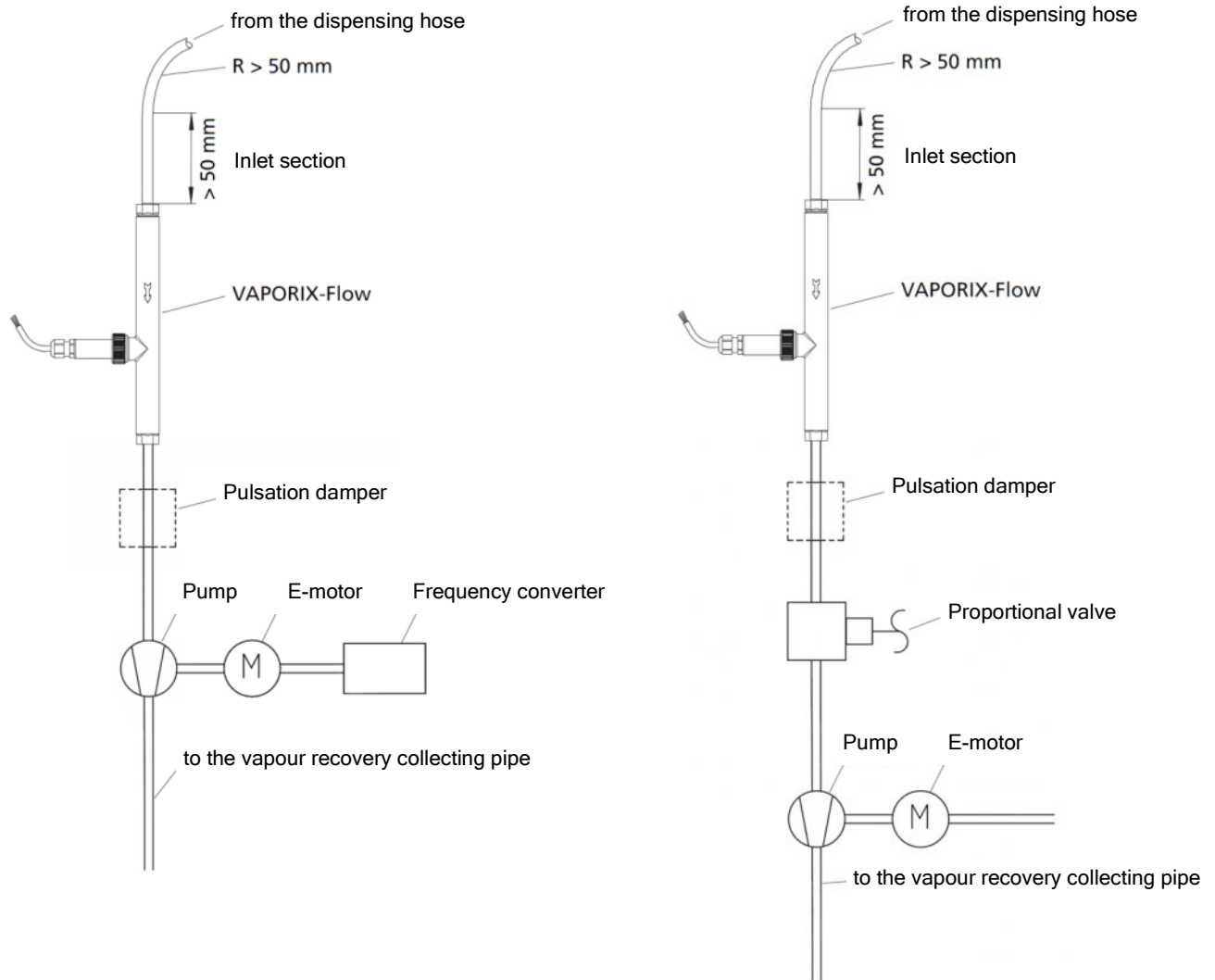


Figure 3: Examples - Installation positions of VAPORIX-Flow

When installing the VAPORIX-Flow the following installation conditions must be fulfilled (see Figure 3):

- The installation of the VAPORIX-Flow is done in the vapour recovery pipe upstream of the pump and any existing control valve.
- The mounting position is vertical with the inlet section on top. The flow direction is embossed on the sensor casing.



*The flow direction arrow must point from the top to the bottom.*



- In front of the transmitter a straight vapour pipe (inlet section), smooth or corrugated, is required with a length of minimum 50 mm and an inner diameter of 8 ... 12 mm.
- The inflow into the inlet section may be done with a minimum radius of 50 mm.
- The inlet section can be connected using a standard fitting.
- The connection to the outlet section of the transmitter can be done in any form. The direct mounting of a 90° degree fitting is also permitted.
- The casing of the VAPORIX-Flow is to be attached vertically in the dispenser with the help of clamps.



*Different installation conditions are permitted only after prior review and written approval by FAFNIR.*



*The VAPORIX-Flow is not allowed to be operated with low-volatile media.*

### 3.2.2 Measures in case of pulsation

Due to the pumping process, most vapour recovery pumps in vapour recovery systems produce pressure surges which result in a pulsating flow behaviour. This pulsation is very prominent in piston and diaphragm pumps. With dual-piston pumps, these effects are much smaller than with single-cylinder piston or single-cylinder diaphragm pumps. With vane pumps, the pulsation is usually negligible.

Within the pipeline system, the pressure surges result in reflections and thus can cause resonances. The accuracy of the VAPORIX system is affected by the pulsation. The magnitude of a possible effect depends on the pulsation amplitude, the average flow velocity and the vapour concentration.

To guarantee the accuracy of VAPORIX system, the following additional installation steps for the vapour recovery system must be carried out:

- Diaphragm or piston pumps with proportional valve control  
The pulsation is largely shielded by the proportional valve. However, a minimum pipe volume of approximately 50 cc should be provided. This corresponds to a total pipe length of approximately 80 cm between sensor and vapour recovery pump, with an inner diameter of 9 mm.
- Double piston pumps with speed control  
Here, a minimum pipe volume of approximately 50 cc should also be provided. This corresponds to a total pipe length of approximately 80 cm between sensor and vapour recovery pump, with an inner diameter of 9 mm.
- Diaphragm or piston pumps with speed control  
Here, the pulsation directly affects the VAPORIX-Flow. Therefore, a pulsation damper should be mounted in the line between sensor and pump. Approximately 10 times of the displacement volume of the pump should be used as pulsation damper, which is typically 250 cc. This can easily be realized by a damper pot. The FAFNIR condensate separator is a well-proven pulsation damper.
- Pump systems with liquid-controlled proportional valve integrated in the nozzle  
The pulsation of the pump running at full speed directly affects the VAPORIX-Flow. Therefore, a pulsation damper should be mounted in the line between sensor and pump. Approximately 10 times of the displacement volume of the pump should be used as pulsation damper, which is typically 250 cc. This can easily be realized by a damper pot. The FAFNIR condensate separator is a well-proven pulsation damper.

### 3.2.3 Connection of the VAPORIX-Flow to the VAPORIX-Control

The 8-core connecting cable (4 m long, Ø approx. 6 mm) is an integral part of the transmitter. To pull the cable through suitable cable glands up to the installation point of the VAPORIX-Control in the head of the dispenser, the plug must be disconnected first and then fitted again as shown in the figure below.

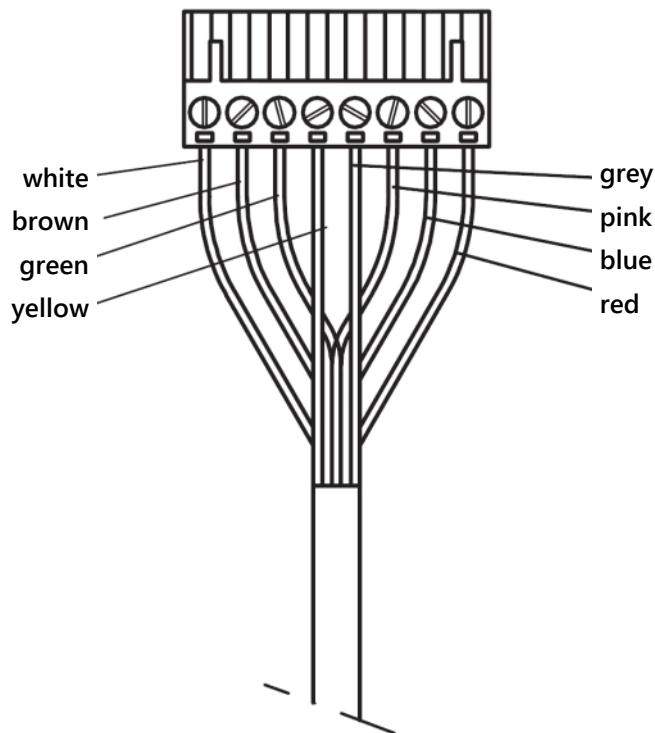


Figure 4: Pin assignment of the connecting cable for VAPORIX-Flow - VAPORIX-Control



*The cable must not be shortened.*



*The cable of the VAPORIX-Flow, which is installed in the vapour recovery pipe of the dispenser with the lower fuelling point number, should be labelled with letter A for easy identification at the upper end and should be connected accordingly to the side A of the evaluation unit. Equally, mark the cable of the second VAPORIX-Flow with the letter B for connection to the site B.*



*After installation and before first use, please read our tips and recommended actions from chapter "Error prevention and troubleshooting".*

### 3.3 Technical Data

|                                    |   |
|------------------------------------|---|
| Explosion protection:              | ⊕ II 1 G Ex ia IIB T4 Ga<br>⊕ II 1/2 G Ex ia IIB T4 Ga/Gb   |
| Approval:                          | TÜV 99 ATEX 1509,<br>IECEX TUN 08.0008                      |
| Index of protection                | IP68  |
| Perm. ambient temperature:         | -40 °C to +65 °C  |
| Perm. operating pressure:          | max. ATM  |
| Max. test pressure:                | 300 kPa   |
| Connection:                        | Only to the evaluation unit VAPORIX-Control                 |
| Connecting thread:                 | 3/8" internal thread  |
| Connection cable:                  | PVC - partly fuel resistant                                 |
| Length:                            | 269 mm  |
| Weight:                            | approximately 1100 g  |
| Material of media<br>wetted parts: | Brass, stainless steel 1.4401 and 1.4436, steel zinc plated |

## 4 VAPORIX-Control evaluation unit

### 4.1 Design and function

The VAPORIX-Control is used as supply and evaluation unit for two transmitters of the type VAPORIX-Flow.

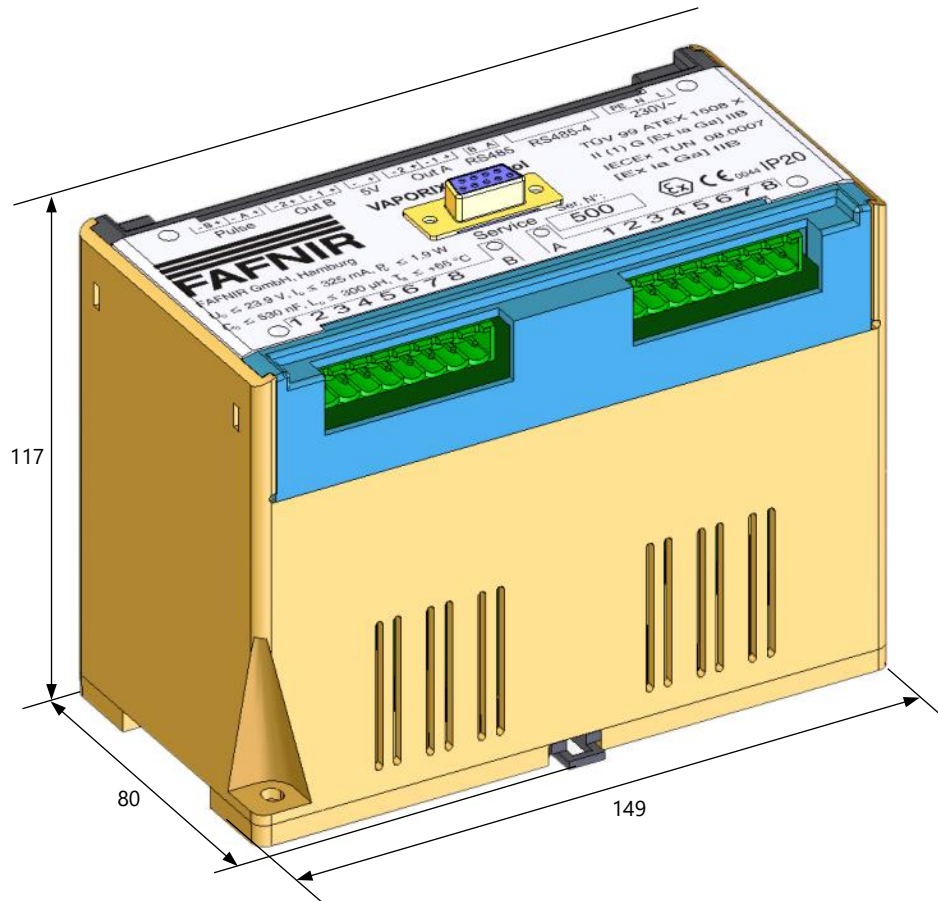


Figure 5: VAPORIX-Control central unit

The VAPORIX-Control determines temperatures, gas concentrations and gas flow rates of the fuelling points from the measured values of VAPORIX-Flow.

The dispenser computer delivers pulse frequencies proportional to the fuel flow as reference values.

The VAPORIX-Control compares the fuel flow with the vapour flow with these data and outputs a status signal. The status of the vapour recovery and the monitoring system is signalled by one tricolour LED per fuelling point B/A (see Figure 6).

#### 4.1.1 Status indication

The status of the vapour recovery and of the monitoring system is indicated with different colours and blink codes of the LED's (see Figure 6).

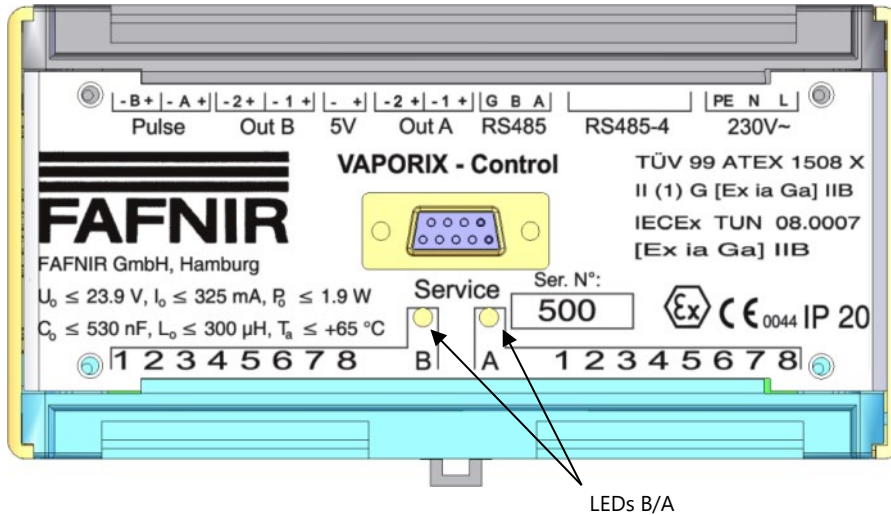


Figure 6: VAPORIX-Control LEDs

#### Colour codes

- If the LED is blinking green, the respective vapour recovery system and the monitoring system are intact. There are no faults.
- If the LED is blinking green and orange alternately, the vapour recovery rate of the respective system was outside the permissible tolerance during the last refuelling.
- If the LED is blinking orange, an alarm signal is output and there is a fault in the respective vapour recovery system which must be repaired within a fixed period of time depending on local regulations (typically 3 days).
- If the LED is blinking red, the period of time has expired and a signal is output that switches off the respective dispenser.

#### Blink codes

|                                       |  |
|---------------------------------------|--|
| LED is blinking slowly                | System is ready for operation  |
| LED is blinking quickly               | Fuel flow is indicated   |
| LED is blinking very quickly          | Vapour flow is indicated even though no fuel flow is present (transmitter is connected to the wrong side A/B).<br>Immediately patch the fault, otherwise an alarm is triggered after 10 refuellings. |
| LED is blinking (long on / short off) | Transmitter is defective or connection fault at the connector<br>Immediately repair the fault or replace the sensor, otherwise an alarm is triggered after 10 refuellings.                           |



*If the VAPORIX-Control operates in conjunction with a DOMS Site Controller PSS5000 (see TÜV certificate 12.4), the signalling (visual/audible) in case of vapour recovery faults is done on the alarm panel of the DOMS Controller. In this case, the respective orange or red blinking of the VAPORIX-Control does not appear (see above).*

## 4.2 Installation



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



*The evaluation unit is built into a casing with the minimum degree of protection IP20. It is not suitable for outdoor installation.*



*The VAPORIX-Control is subject to national construction approvals (in Germany DIBT) and therefore only allowed to be repaired by FAFNIR or companies authorized by FAFNIR. In case of failure, always the complete evaluation unit must be replaced.*

The evaluation unit must be placed outside the potentially explosive area in the dispenser head in a suitable position, screwed or clipped onto a DIN rail.



*When installing the evaluation unit, note that all plug-in connectors, LEDs and the service interface are fully visible and accessible for any service work.*

Connect the transmitters, the pulse inputs and auxiliary power to the VAPORIX-Control interface (see Figure 7) and as well the data line of the SECON or the dispenser, if available. For connecting the switching off outputs, please refer to the specifications by the manufacturers of the respective dispensers.



*Only transmitters certified by a recognized European inspection authority may be connected.*



*After installation and before first use, please read our tips and recommended actions from chapter "Error prevention and troubleshooting".*

**!** The VAPORIX-Control may only be operated in atmospheric environments. The operation in flame proof enclosures, such as natural gas dispensers is not allowed.

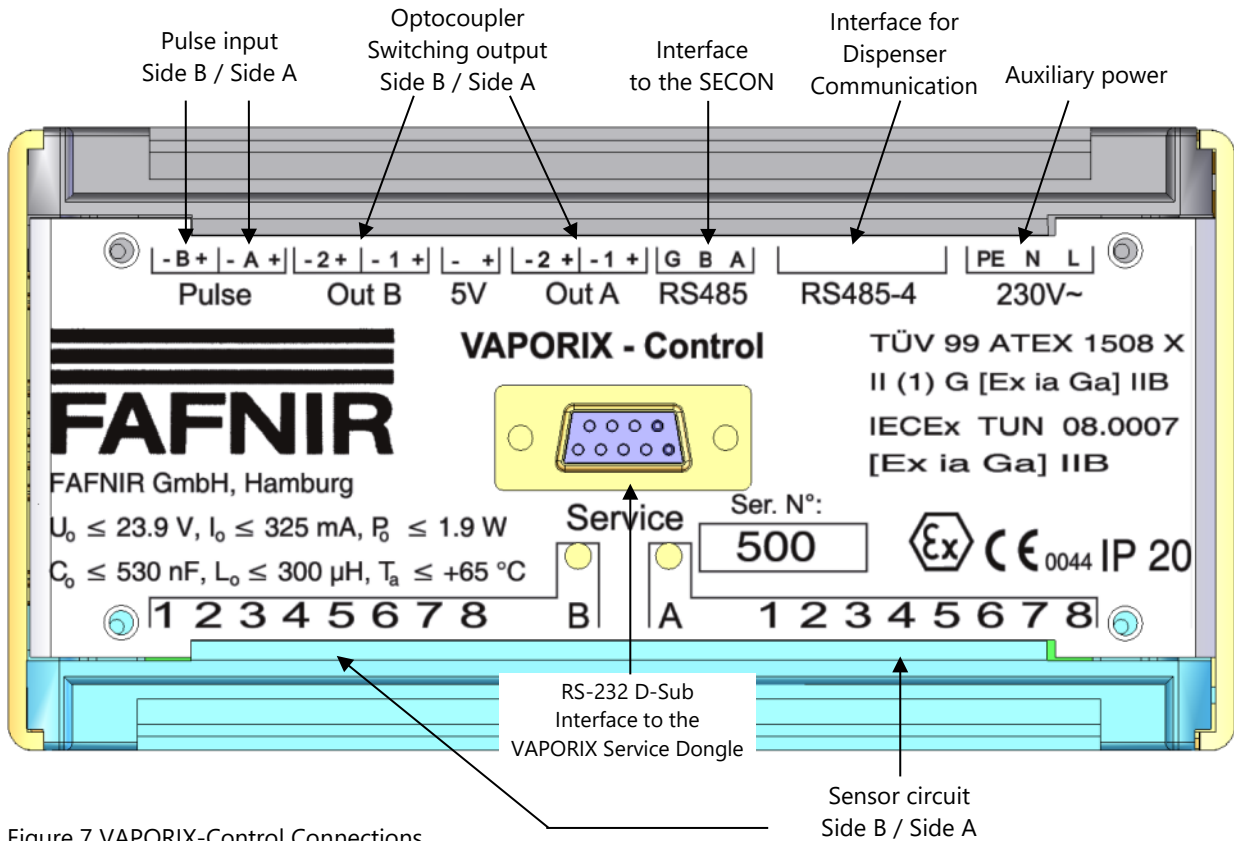



Figure 7 VAPORIX-Control Connections



### 4.3 Technical Data

|  |  |
|--|--|
| Explosion protection:                  |  II (1) G [Ex ia Ga] IIB  |
| Approval:                              | TÜV 99 ATEX 1508 X,<br>IECEX TUN 08.0007   |
| Protection class:                      | IP20   |
| Perm. ambient temp.:                   | -20 ... +65 °C   |
| Auxiliary Power (L, N, PE)             | 115/230 VAC, ±10 %, 50 ... 60 Hz, appr. 18 VA<br>max. Voltage: $U_m = 130 \text{ V}$ at 115 VAC<br>max. Voltage: $U_m = 253 \text{ V}$ at 230 VAC  |
| Connection data<br>per sensor circuit: | with ignition protection class Ex ia IIB<br>$U_0 \leq 23.9 \text{ V}$<br>$I_0 \leq 325 \text{ mA}$<br>$P_0 \leq 1.9 \text{ W}$<br>$L_0 \leq 300 \text{ } \mu\text{H}$<br>$C_0 \leq 530 \text{ nF}$ |



*The intrinsically safe circuits are safely galvanically isolated from the supply circuit (power supply) up to a peak value of nominal voltage of 375 V.*

|                                       |  |
|---------------------------------------|--|
| Pulse inputs:                         | Rectangular signal with 5 V (1 mA) to 24 V (6 mA),<br>max. 1 kHz,<br>duty cycle 20 ... 80%, potential-free,<br>reverse polarity protection   |
| Pulse valency:                        | 100 impulses/litre set by default,<br>other values (33.3 - 50 - 132 - 200) can be set<br>in the configuration  |
| Switching outputs<br>(Out A / Out B): | Optocoupler 1 ... 30 V, max. 100 mA potential-free,<br>short circuit at reverse polarity connection:<br>OutX1 closed: Fuelling point released<br>OutX1 open: Fuelling point locked<br>OutX2 closed: Alarm (residual time < 72 h)<br>OutX2 open: no alarm |



|                                   |   |
|-----------------------------------|---|
| Service interface:                | RS-232, 8N1, 9600 baud,<br>maximum safety Voltage: $U_m = 30\text{ V}$  |
| RS-485 2-wire:<br>Pin assignment: | Data bus for up to 32 fuelling points, 8N1, 9600 baud<br>Pin 1 = Ground (G)<br>Pin 2 = B<br>Pin 3 = A   |
| RS-485 4-wire:<br>Pin assignment: | RS-422 for dispenser communication, 8E1, 9600 baud<br>Pin 1, 2, 9, 10: not used<br>Pin 3: TxD B<br>Pin 4: TxD A<br>Pin 5: RxD B<br>Pin 6: RxD A<br>Pin 7: Supply (-)<br>Pin 8: Supply (+) |
| 5-V output:                       | max. 50 mA  |
| Casing dimensions:                | 149 x 80 x 117 mm   |
| Weight:                           | approximately 750 g   |
| Casing material:                  | Polycarbonate, glass fibre reinforced   |

## **5 Fault prevention and troubleshooting (after installation)**

FAFNIR recommends carrying out the following measures before the automatic monitoring system is put into operation.

### **5.1 Checking the dispenser settings**

The fuel flow speed must not exceed the maximum gas flow speed specified in the certificate of the vapour recovery system.

Consider in this context that, after replacing a fuel filter the fuel flow speed can increase.

### **5.2 Checking the vapour recovery system**

Make sure that:

- the vapour recovery system is gas-tight (pressure test according to the manufacturer's specification)
- there is no fluid leakage to the vapour recovery system
- at MPDs (Multi Product Dispenser) the open-close valves for selection of the vapour channel open and close correctly under all circumstances
- the pulse valency (impulses per volume unit) of the fuel flow counter of the dispenser must comply with those of the vapour recovery system and the automatic monitoring system
- at MPDs the assignment of the vapour recovery is properly adjusted (vapour recovery pump must start for all Petrol fuels, but must not start for Diesel fuel)

### **5.3 Check measurements with monitoring system**

FAFNIR recommends carrying out the following measures after installation of the automatic monitoring system:

- Adjust the vapour recovery system (dry adjustment according to manufacturer's specifications). Use only properly maintained instruments, which are in perfect condition. For dry adjustment, the vapour recovery system must be free of hydrocarbons.
- Check the adjustment by means of a simulation measurement.
- By means of the status indicator on the VAPORIX-Control (LED blink and colour-codes) check the function of the automatic monitoring system and the vapour recovery system (see section "Design and function" in chapter "VAPORIX-Control evaluation unit").



*Carry out some sample fillings (> 20 s and > 25 l/min) or wait for some customer fillings and then check the history data using the SECON or the VAPORIX-Diagnostic program (see separate manual).*

## **5.4 Troubleshooting**

To facilitate the troubleshooting and fault analysis, FAFNIR recommends using the FAFNIR PC program "VAPORIX-Diagnostic" together with the FAFNIR-Diagnostic-Compendium.

## 6 Maintenance

### 6.1 Return shipment

Before returning any FAFNIR equipment the Return Material Authorization (RMA) by the FAFNIR customer support 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 care.*



**EU-Konformitätserklärung  
EU Declaration of Conformity  
Déclaration UE de Conformité**

**FAFNIR GmbH  
Schnackenburgallee 149 c  
22525 Hamburg  
Deutschland / Germany / Allemagne**

erklärt als Hersteller in alleiniger Verantwortung, dass das Produkt  
declares as manufacturer under sole responsibility that the product  
déclare sous sa seule responsabilité en qualité de fabricant que le produit

**Messwertgeber / Transmitter / Capteur de mesure**

**VAPORIX-Flow**

den Vorschriften der europäischen Richtlinien  
complies with the regulations of the European directives  
est conforme aux réglementations des directives européennes suivantes

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

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

**RoHS / RoHS / RoHS  
EMV / EMC / CEM  
ATEX / ATEX / ATEX**

**EN 50581:2012  
EN 61326-1:2013  
EN 60079-0:2012 + A11:2013  
EN 60079-11:2012  
EN 60079-26:2015**

Das Produkt ist bestimmt als Elektro- und Elektronikgerät der RoHS-  
The product is determined as electrical and electronic equipment of RoHS  
Le produit est 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**

Das Produkt entspricht den EMV-Anforderungen  
The product complies with the EMC requirements  
Le produit est conforme aux exigences CEM

**Störaussendung / Emission / Émission  
Störfestigkeit / Immunity / D'immunité**

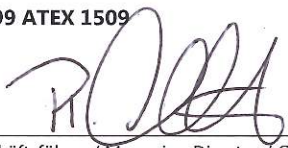
**Klasse B / Class B / Classe B  
Grundlegende elektromagnetische Umgebung /  
Basic electromagnetic environment /  
Environnement électromagnétique ordinaire**

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

**VAPORIX-Flow**

**TÜV 99 ATEX 1509**

Hamburg, 14.05.2018  
Ort, Datum / Place, Date / Lieu, Date

  
Geschäftsführer / Managing Director / Gérant: René Albrecht



**EU-Konformitätserklärung  
EU Declaration of Conformity  
Déclaration UE de Conformité**

**FAFNIR GmbH  
Schnackenburgallee 149 c  
22525 Hamburg  
Deutschland / Germany / Allemagne**

erklärt als Hersteller in alleiniger Verantwortung, dass das Produkt  
declares as manufacturer under sole responsibility that the product  
déclare sous sa seule responsabilité en qualité de fabricant que le produit

**Messauswertung / Evaluation Unit / Unité d'analyse**

**VAPORIX-Control ...**

den Vorschriften der europäischen Richtlinien  
complies with the regulations of the European directives  
est conforme aux réglementations des directives européennes suivantes

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

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

|                           |                                   |
|---------------------------|-----------------------------------|
| <b>RoHS / RoHS / RoHS</b> | <b>EN 50581:2012</b>              |
| <b>EMV / EMC / CEM</b>    | <b>EN 61326-1:2013</b>            |
| <b>ATEX / ATEX / ATEX</b> | <b>EN 60079-0:2012 + A11:2013</b> |
|                           | <b>EN 60079-11:2012</b>           |

Das Produkt ist bestimmt als Elektro- und Elektronikgerät der RoHS-  
The product is determined as electrical and electronic equipment of RoHS  
Le produit est déterminés comme des équipements électriques et électroniques de RoHS

|   |   |
|---|---|
| <b>Kategorie / Category / Catégorie</b> | <b>Überwachungs- und Kontrollinstrumenten in der Industrie /<br/>Industrial Monitoring and Control Instruments /<br/>Instruments de contrôle et de surveillance industriels</b> |
|---|---|

Das Produkt entspricht den EMV-Anforderungen  
The product complies with the EMC requirements  
Le produit est conforme aux exigences CEM

|   |   |
|---|---|
| <b>Störaussendung / Emission / Émission</b>   | <b>Klasse B / Class B / Classe B</b>  |
| <b>Störfestigkeit / Immunity / D'immunité</b> | <b>Grundlegende elektromagnetische Umgebung /<br/>Basic electromagnetic environment /<br/>Environnement électromagnétique ordinaire</b> |

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

|                            |                           |
|----------------------------|---------------------------|
| <b>VAPORIX-Control ...</b> | <b>TÜV 99 ATEX 1508 X</b> |
|----------------------------|---------------------------|

Hamburg, 25.08.2016  
Ort, Datum / Place, Date / Lieu, Date

Geschäftsführer / Managing Director / Gérant: René Albrecht

Translation

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

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



(3) **Certificate Number** TÜV 99 ATEX 1509 **issue:** 00

(4) for the product: Transmitter type VAPORIX-Flow

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

(6) Address: Schnackenburgallee 149 c, 22525 Hamburg, Germany

Order number: 8000482538

Date of issue: 2018-02-27

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

(8) The TÜV NORD CERT GmbH, Notified Body No. 0044, in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.  
The examination and test results are recorded in the confidential ATEX Assessment Report No. 18 203 218423.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
**EN 60079-0:2012 + A11:2013**                      **EN 60079-11:2012**                      **EN 60079-26:2015**  
except in respect of those requirements listed at item 18 of the schedule.

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

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

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

 **II 1 G Ex ia IIB T4 Ga**                      **II 1/2 G Ex ia IIB T4 Ga/Gb**

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body



Roder

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



(13) **SCHEDULE**

(14) **EU-Type Examination Certificate No. TÜV 99 ATEX 1509 issue 00**

(15) Description of product

The transmitter is used to measure gas flow as part of an automatic monitoring device to check the function of the vapour recovery systems at filling stations.

The transmitter type VAPORIX-Flow may in future also be manufactured in accordance with the test documents listed in the ATEX test report. The changes concern the change of temperature class, the marking as well as the change of the address of the manufacturer.

Type designation:

VAPORIX-Flow            Transmitter for connection to VAPORIX-Control ...

Technical data:

Sensor circuits "1" to "8"            in type of protection "Intrinsic Safety" Ex ia IIB  
only for the connection to the associated evaluation unit type  
VAPORIX-Control ... according to EU-type examination certificate  
No. TÜV 99 ATEX 1508 X

Permissible ambient temperature range:

-40 °C to +65 °C

(16) Drawings and documents are listed in the ATEX Assessment Report No. 18 203 218423

(17) Specific Conditions for Use

none

(18) Essential Health and Safety Requirements

no additional ones

- End of Certificate -



Transmitter type VAPORIX-Flow

Edition: 02.2018

**I Range of application**

The transmitter is used to measure gas flow as part of an automatic monitoring device to check the function of the vapour recovery systems at filling stations.

**II Standards**

The equipment is designed in accordance with the following European standards

|                            |  |
|----------------------------|--|
| EN 60079-0:2012 + A11:2013 | Equipment – General requirements                   |
| EN 60079-11:2012           | Equipment protection by intrinsic safety "i"       |
| EN 60079-26:2015           | Equipment with Equipment Protection Level (EPL) Ga |

**III Instructions for safe ...**

**III.a ... use**

The transmitter serves as intrinsically safe apparatus and is suitable for use in potentially explosive atmospheres. The transmitter is suitable for gases of groups IIA and IIB with temperature classes T1, T2, T3 and T4.

The transmitter may only be connected to the evaluation unit type VAPORIX-Control... (TÜV 99 ATEX 1508 X).

**III.b ... assembling and dismantling**

Disassembly of the transmitter is not intended. A disassembly would also damage the transmitter and the certificate expiry!

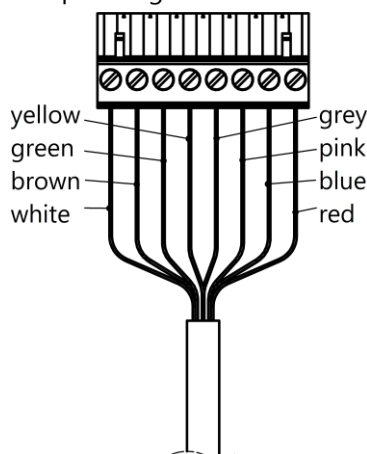
**III.c ... installation**

The wiring may only be done de-energized. Special regulations i. a. EN 60079-14 or the local installation regulations must be observed.

The pipe threads are to be provided with suitable sealing material and inserted into the pipe system.

When wiring from the transmitter to the evaluation unit (preferably blue cable), the permissible inductance and capacity of the evaluation unit must not be exceeded.

Connector pin assignment:



General remark (see also EN 60079-14:2014, Clause 6.4.1):

Exposed conductive parts need not be separately connected to the equipotential bonding system if they are firmly secured to and are in conductive contact with structural parts or piping which are connected to the equipotential bonding system.



### III.d ... adjustment

For the operation of the transmitter, no Ex-relevant adjustments are necessary.

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



Before putting into service, all devices must be checked for correct connection and installation. The electrical supply, including the connected devices, must be checked.

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

The apparatus is generally maintenance-free. In the case of a defect, this must be returned to the manufacturer FAFNIR or one of its representatives.

It is in conformance with the dielectric strength requirements between the intrinsically safe circuit and the chassis of the transmitter with 500 V<sub>AC</sub> in accordance with EN 60079-11, Clause 6.3.13.

## IV Equipment marking

- |   |                     |   |
|---|---------------------|---|
| 1 | Manufacturer:       | FAFNIR GmbH, 22525 Hamburg  |
| 2 | Type designation:   | VAPORIX-Flow  |
| 3 | Certificate number: | TÜV 99 ATEX 1509  |
| 4 | Ex marking:         |  II 1 G      Ex ia IIB T4 Ga<br>II 1/2 G      Ex ia IIB T4 Ga/Gb |
| 5 | CE marking:         |  0044  |
| 6 | Technical data:     | T <sub>a</sub> = -40 °C ... +65 °C  |

## V Technical data

The transmitter must only be connected to the certified evaluation unit type VAPORIX-Control ... in accordance with the EU-type examination certificate TÜV 99 ATEX 1508 X. The electrical input data of the transmitter are adapted to the evaluation unit and are not listed here.

The transmitter may be used in the following ambient temperature range:

$$T_a = -40 \text{ °C} \dots +65 \text{ °C}$$

General remark (see also EN 60079-0, Clause 1):

Zone 0 is given only under atmospheric conditions:

Temperature range: -20 °C ... +60 °C

Pressure range: 0,8 bar ... 1,1 bar

Oxidant: Air (oxygen content approx. 21 %)

The transmitter achieves a degree of protection of:

Degree of protection: IP68

## VI Special conditions of use

None.

Translation

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

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



(3) **Certificate Number** TÜV 99 ATEX 1508 X **issue:** 00

(4) for the product: Evaluation Unit type VAPORIX-Control ...

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

(6) Address: Schnackenburgallee 149 c, 22525 Hamburg, Germany

Order number: 8000 460585

Date of issue: 2016-05-25

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

(8) The TÜV NORD CERT GmbH, Notified Body No. 0044, in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.  
The examination and test results are recorded in the confidential ATEX Assessment Report No. 16 203 181780.

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

**EN 60079-0:2012 + A11:2013 EN 60079-11:2012**

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

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

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

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

 **II (1) G [Ex ia Ga] IIB**

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body

  
Karl-Heinz Schwedt

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

## (13) SCHEDULE

(14) EU-Type Examination Certificate No. TÜV 99 ATEX 1508 X issue 00

(15) Description of product

The evaluation unit is a part of an automatic monitoring device to check the function of the vapour recovery systems at petrol stations. The evaluation unit must only be installed outside of potential explosive atmosphere. Two intrinsic safety sensors as maximum can connected to every evaluation unit.

The evaluation unit type VAPORIX-Control ... may also be manufactured according to the ATEX test documents listed in the test report.

The changes concern the extension of type VAPORIX-Control II as well as the change of the manufacturer address.

### Type designation:

|                       |  |
|-----------------------|--|
| VAPORIX-Control       | Evaluation unit in a top hat rail enclosure                              |
| VAPORIX-Control Basic | Evaluation unit in a top hat rail enclosure without RS-485 communication |
| VAPORIX-Control II    | Evaluation unit in a built-on enclosure                                  |

### Technical data:

Type VAPORIX-Control and Type VAPORIX-Control Basic

|  |   |
|--|---|
| Supply circuit „230V~“<br>(terminals L, N, PE) | U = 115/230 V a. c. $\pm$ 10 %, 50 ... 60 Hz, about 18 VA<br>U <sub>m</sub> = 130 V at 115 V a. c.<br>U <sub>m</sub> = 253 V at 230 V a. c. |
|--|---|

|   |   |
|---|---|
| Sensor circuits „B“ and „A“<br>(terminals 1 to 8) | in type of protection “Intrinsic Safety” Ex ia IIB<br>Maximum values per circuit: |
|---|---|

|                              |
|------------------------------|
| U <sub>o</sub> = 23.9 V      |
| I <sub>o</sub> = 325 mA      |
| P <sub>o</sub> = 1.9 W       |
| R = 76 $\Omega$              |
| Characteristic line: linear  |
| L <sub>o</sub> = 380 $\mu$ H |
| C <sub>o</sub> = 480 nF      |

Aforementioned maximum values are valid at coincidental appearance of concentrated capacitance and inductance.

|   |  |
|---|--|
| Clock input „Pulse“<br>(terminals -B+, -A+) | U = 5 V ... 30 V<br>U <sub>m</sub> = 134 V |
|---|--|

|   |  |
|---|--|
| Control outputs „Out B“ and „Out A“<br>(terminals -2+, -1+) | U $\leq$ 30 V<br>I $\leq$ 200 mA<br>U <sub>m</sub> = 134 V |
|---|--|

|   |                           |
|---|---------------------------|
| Voltage output „5V“<br>(terminals -, +) | U = 5 V<br>I $\leq$ 50 mA |
|---|---------------------------|

|  |                                    |
|--|------------------------------------|
| Two-wire RS-485 „RS485“<br>(terminals G, B, A) | U < 12 V<br>U <sub>m</sub> = 134 V |
|--|------------------------------------|

|  |                                    |
|--|------------------------------------|
| Four-wire RS-485 „RS485-4“<br>(plug connector) | U < 12 V<br>U <sub>m</sub> = 134 V |
|--|------------------------------------|

|  |   |
|--|---|
| RS-232 interface „Service“<br>(Sub D socket) | U $\leq$ 12 V<br>U <sub>m</sub> = 134 V |
|--|---|

**Schedule to EU-Type Examination Certificate No. TÜV 99 ATEX 1508 X issue 00**

Type VAPORIX-Control II

Supply circuit „24V“  
(terminals +, -)

Sensor circuits „A“ and „B“  
(terminals 1 to 8)

$U = 24 \text{ V d. c. } \pm 5 \%, \text{ ca. } 9 \text{ W}$

$U_m = 253 \text{ V}$

in type of protection "Intrinsic Safety" Ex ia IIB

Maximum values per circuit:

$U_o = 22.2 \text{ V}$

$I_o = 371 \text{ mA}$

$P_o = 2.1 \text{ W}$

$R = 60 \Omega$

Kennlinie: linear

$L_i = 10 \mu\text{H}$

$C_i = 200 \text{ nF}$

$L_o = 440 \mu\text{H}$

$C_o = 510 \text{ nF}$

Aforementioned maximum values are valid at coincidental appearance of concentrated capacitance and inductance.

RS-422 „RS422“  
(plug connector)

$U < 12 \text{ V}$

$U_m = 134 \text{ V}$

RS-485 „RS485“  
(terminals A, B, G)

$U < 12 \text{ V}$

$U_m = 134 \text{ V}$

Permissible ambient temperature range:

-20 °C to +65 °C

All further data are valid unchanged.

(16) Drawings and documents are listed in the ATEX Assessment Report No. 16 203 181780

(17) Specific Conditions for Use

1. The evaluation unit type VAPORIX-Control II must installed in an enclosure with a degree of protection provided by enclosure according to IEC 60529 of at least IP20.
2. The potential equalization terminal (PA) on the evaluation unit type VAPORIX-Control II must bonded to the potential equalization system of the potential explosive area.

(18) Essential Health and Safety Requirements

no additional ones

- End of Certificate -



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

TÜV 99 ATEX 1508 X

### Evaluation Unit type VAPORIX-Control ...

Edition: 05.2016

#### I Range of application

The evaluation unit is a part of an automatic monitoring device to check operation of vapour recovery systems at petrol stations.

#### II Standards

The evaluation unit is designed in accordance with the following European standards

|                            |  |
|----------------------------|--|
| EN 60079-0:2012 + A11:2013 | Equipment – General requirements             |
| EN 60079-11:2012           | Equipment protection by intrinsic safety "i" |

#### III Instructions for safe ...

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

The evaluation unit serves as associated equipment and is not approved for use in potentially explosive areas. The intrinsically safe electric circuits of the evaluation unit may be routed to Zone 0 and can be used for gas groups IIA and IIB.

The approval is valid for the device versions

|                       |  |
|-----------------------|--|
| VAPORIX-Control       | Evaluation unit in DIN rail housing                              |
| VAPORIX-Control Basic | Evaluation unit in DIN rail housing without RS-485 communication |
| VAPORIX-Control II    | Evaluation unit in modular housing                               |

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

The assembly and disassembly must solely be carried out with the power disconnected!

The housing of the top hat rail enclosure must not be opened!

The evaluation unit type VAPORIX-Control II can be operated in a modular housing. Then there must be an equipotential terminal on the board. Should the board be fixed on another bracket/housing a secure connection must be established for potential equalization on at least one of the three PA connections.



### III.c ... installation

Wiring work may only be performed with the power disconnected. Special rules and regulations, including EN 60079-14 and local installation regulations, must be observed.

The evaluation unit in DIN rail housing is suitable for DIN rail and wall mounting. The evaluation unit in modular housing must be installed in a housing with a degree of protection of at least IP20. The evaluation unit must be installed outside potentially explosive atmospheres/areas. If the evaluation unit is mounted outdoors, the casing protection class must be at least IP54.

The wiring from the sensor (VAPORIX-Flow) to the evaluation unit (preferably blue coloured cable) must not exceed the permissible inductance and capacitance according to section V.

Terminal designation:

| Connection             | Terminal          | Contacts                     |
|------------------------|-------------------|------------------------------|
| Auxiliary power        | 230V~             | PE, N and L                  |
| Sensor circuits        | B resp. A         | 1 to 8 as appropriate        |
| Pulse input            | Pulse             | -B+ resp. -A+                |
| Control outputs        | Out B resp. Out A | -2+ resp. -1+ as appropriate |
| Voltage output         | 5V                | - and +                      |
| RS-485 two-wire cable  | RS485             | G, B and A                   |
| RS-485 four-wire cable | RS485-4           | (Cradle connector)           |
| RS-232 interface       | Service           | (Sub D jack)                 |

Table III.c1: Terminal labelling on the evaluation unit VAPORIX-Control

| Connection       | Terminal          | Contacts                     |
|------------------|-------------------|------------------------------|
| Auxiliary power  | 230V~             | PE, N and L                  |
| Sensor circuits  | B resp. A         | 1 to 8 as appropriate        |
| Pulse input      | Pulse             | -B+ resp. -A+                |
| Control outputs  | Out B resp. Out A | -2+ resp. -1+ as appropriate |
| Voltage output   | 5V                | - and +                      |
| RS 232 interface | Service           | (Sub D jack)                 |

Table III.c2: Terminal labelling on the evaluation unit VAPORIX-Control Basic

| Connection            | Terminal  | Contacts              |
|-----------------------|-----------|-----------------------|
| Auxiliary power       | 24V=      | - and +               |
| Sensor circuits       | A resp. B | 1 to 8 as appropriate |
| RS-422                | RS422     | (Cradle connector)    |
| RS-485                | RS485     | A, B and G            |
| Equipotential bonding | PA        | PA                    |

Table III.c3: Terminal labelling on the evaluation unit VAPORIX-Control II

The evaluation unit VAPORIX-Control II must be bonded in the potential equalization of the hazardous area.





### III.d ... adjustment

To operate the evaluation unit no safety-related facilities are required.

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

Before putting into service, all devices must be checked for correct connection and installation. The electrical supply, including the connected devices, must be checked.



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

In general, the evaluation unit is maintenance-free. If there is a defect, it must be sent back to the manufacturer FAFNIR or one of its representatives.

The evaluation units VAPORIX-Control and VAPORIX-Control Basic are in compliance with the requirements for dielectric strength according to EN 60079-11, Clause 6.3.13 between the intrinsically safe sensor circuits and the power supply, the communication terminals and the outputs.

The evaluation unit VAPORIX-Control II is in compliance with the requirements for dielectric strength according to EN 60079-11, Clause 6.3.13 between the intrinsically safe sensor circuits and the communication terminals. No compliance is between the intrinsically safe sensor circuits and the power supply.

## IV Equipment marking

|   |                     |  |                            |
|---|---------------------|--|----------------------------|
| 1 | Manufacturer:       | FAFNIR GmbH, Hamburg   |                            |
| 2 | Type designation:   | VAPORIX-Control ...  |                            |
| 3 | Certificate number: | TÜV 99 ATEX 1508 X   |                            |
| 4 | Ex marking:         |  II (1) G [Ex ia Ga] IIB |                            |
| 5 | CE marking:         |  0044                   |                            |
| 6 | Technical data:     | VAPORIX-Control<br>VAPORIX-Control Basic   | VAPORIX-Control II         |
|   |                     | $U_o \leq 23.9 \text{ V}$  | $U_o \leq 22.2 \text{ V}$  |
|   |                     | $I_o \leq 325 \text{ mA}$  | $I_o \leq 371 \text{ mA}$  |
|   |                     | $P_o \leq 1.9 \text{ W}$   | $P_o \leq 2.1 \text{ W}$   |
|   |                     | $L_o \leq 380 \mu\text{H}$   | $L_o \leq 440 \mu\text{H}$ |
|   |                     | $C_o \leq 480 \text{ nF}$  | $C_o \leq 510 \text{ nF}$  |
|   |                     | $T_a \leq +65 \text{ °C}$  | $C_i < 200 \text{ nF}$     |
|   |                     |  | $L_i < 10 \mu\text{H}$     |
|   |                     |  | $T_a \leq +65 \text{ °C}$  |



## V Technical data

The power supply for the evaluation unit, depending on model

| Power Supply           |                | VAPORIX-Control<br>VAPORIX-Control Basic                           | VAPORIX-Control II       |
|------------------------|----------------|--|--------------------------|
| Voltage                | U              | 115 V <sub>AC</sub> ± 10 % resp.<br>230 V <sub>AC</sub> ± 10 %     | 24 V <sub>DC</sub> ± 5 % |
| Frequency              | F              | 50 Hz ... 60 Hz  | -                        |
| Input Power            | P              | ~ 18 VA  | < 9 W                    |
| Maximum Safety Voltage | U <sub>m</sub> | 134 V @ U = 115 V <sub>AC</sub><br>253 V @ U = 230 V <sub>AC</sub> | 253 V                    |

The evaluation unit VAPORIX-Control II may only be connected to power supply networks, where the expected AC does not exceed a value of 1.5 kA.

The electric circuits of the sensors have "Intrinsic safety" [ia] ignition protection class with a linear output characteristic. Output values per electric circuit are

| Sensor circuit    |                | VAPORIX-Control<br>VAPORIX-Control Basic | VAPORIX-Control II |
|-------------------|----------------|--|--------------------|
| Output Voltage    | U <sub>o</sub> | ≤ 23.9 V                                 | ≤ 22.2 V           |
| Output Current    | I <sub>o</sub> | ≤ 325 mA                                 | ≤ 371 mA           |
| Output Power      | P <sub>o</sub> | ≤ 1.9 W                                  | ≤ 2.1 W            |
| Inner Capacitance | C <sub>i</sub> | -  | < 200 nF           |
| Inner Inductance  | L <sub>i</sub> | -  | < 10 μF            |

The permissible external inductance and capacitance are:

| IIB              | VAPORIX-Control / VAPORIX-Control Basic |        |        |        | VAPORIX-Control II |        |        |        |
|------------------|---|--------|--------|--------|--------------------|--------|--------|--------|
| L <sub>o</sub> ≤ | <b>380 μH</b>                           | 200 μH | 100 μH | 50 μH  | <b>440 μH</b>      | 200 μH | 100 μH | 50 μH  |
| C <sub>o</sub> ≤ | <b>480 nF</b>                           | 620 nF | 800 nF | 940 nF | <b>510 nF</b>      | 680 nF | 880 nF | 1.1 μF |

The maximum values of the parameter pairings may simultaneously be used as concentrated capacitance (minus C<sub>i</sub>) and concentrated inductance (minus L<sub>i</sub>).

The values written in bold can be found also in the equipment marking.

The intrinsically safe sensor circuits of the evaluation units type VAPORIX-Control and type VAPORIX-Control Basic are safely galvanically isolated from the power supply circuit up to a peak value of a nominal voltage 375 V.

The intrinsically safe sensor circuits, if available, are galvanically isolated from the pulse inputs, control outputs, communication interfaces, and voltage output safely up to a peak of 190 V nominal voltage.



As a reference, the corresponding pulse output of the fuel dispenser computer must be connected to the pulse inputs (Pulse). The admissible voltage signal is between

$$U = 5 \text{ V} \dots 30 \text{ V}$$

The control outputs (Out) can be loaded with following electrical values

$$U = 30 \text{ V}$$

$$I = 200 \text{ mA}$$

The signal voltage of the communication interfaces (RS-422, RS-485, RS-485-4 and Service) is

$$U \leq 12 \text{ V}$$

The maximum safety voltage of the pulse inputs, the control outputs, the voltage outputs and the communication interfaces is

$$U_m = 134 \text{ V}$$

The voltage output supplies the following electrical values

$$U = 5 \text{ V}$$

$$I \leq 50 \text{ mA}$$

The evaluation unit can be used in the following ambient temperature range:

$$T_a = -20 \text{ °C} \dots +65 \text{ °C}$$

The evaluation unit achieves a protection rating of

VAPORIX-Control IP20

VAPORIX-Control Basic IP20

VAPORIX-Control II IP00

## **VI Special conditions of use**

1. The evaluation unit type VAPORIX-Control II must be installed in an enclosure with a degree of protection provided by enclosure according to EN 60529 of at least IP20.
2. The potential equalization terminal (PA) on the evaluation unit type VAPORIX-Control II must be bonded to the potential equalization system of the potential explosive area.



**Government of India**  
**Ministry of Commerce & Industry**  
**Petroleum & Explosives Safety Organisation (PESO)**  
**5th Floor, A-Block, CGO Complex, Seminary Hills,**  
**Nagpur - 440006**

E-mail : [explosives@explosives.gov.in](mailto:explosives@explosives.gov.in)  
 Phone/Fax No : 0712 -2510248, Fax-2510577

**Approval No : A/P/HQ/TN/104/5964 (P501903)**

**Dated : 29/04/2021**

To,

**M/s. Fafnir GmbH,**  
**Schnackenburgalle 149c,Hamburg**  
**22525**  
**GERMANY**

**Sub :** Approval of Intrinsically Safe Type Equipment under Petroleum Rules 2002- Regarding.

Sir(s),

Please refer to your letter No. **OIN779434** dated **09/04/2021** on the subject.

The following Ex electrical equipment(s) manufactured by you according to **EN 60079-0 : 2012/A11 : 2013, EN 60079-11 : 2012**, standards and covered under **TUV NORD CERT GmbH** Test reports mentioned below is/are approved for use in of Gas **SafeArea** hazardous areas coming under the the Petroleum Rules, 2002 administered by this Organization.

| Sr. No | Description                             | Safety Protection  | Equipment reference Number | Test Agency        |                            |                  | Drawing no  |
|--------|---|--|----------------------------|--------------------|----------------------------|------------------|---|
|        |   |  |                            | Name               | Certificate No.            | Certificate Date |   |
| 1      | Evaluation Unit type VAPORIX-Control... | [Ex ia Ga] IIB (Approved for installation in safe area only) | <b>P501903/1</b>           | TUV NORD CERT GmbH | TUV 99 ATEX 1508 X Issue 0 | 25/05/2016       | XO 014 43 10-...,<br>XO 014 4311-...,<br>XO 014 43 12-... |

This Approval is granted subject to observance of the following conditions:-

- 1)The design and construction of the equipment shall be strictly in accordance with description, condition and drawings as mentioned in the TUV NORD CERT GmbH Test Reports referred to above.
- 2)The equipment shall be used only with approved type of accessories and associated apparatus.
- 3)Each equipment shall be marked either by raised lettering cast integrally or by plate attached permanently to the main structure to indicate conspicuously:-
  - (a) Name of the manufacturer
  - (b) Name and number by which the equipment is identified.
  - (c) Number & date of the test report of the TUV NORD CERT GmbH applicable to the equipment.
  - (d) Equipment reference number of this letter by which use of apparatus is approved.
  - (e) Protection level.

4) A certificate to the effect that the equipment has been manufactured strictly in accordance with the drawing referred to in the TUV NORD CERT GmbH Test report and is identical with the one tested and certified at TUV NORD CERT GmbH shall be furnished with each equipment.

5) The customer shall be supplied with a copy of this letter, an extract of the conditions and maintenance schedule, if any, recommended by TUV NORD CERT GmbH in their test reports and copy of instructions booklet detailing operation & maintenance of the equipment so as to maintain its Flame Proof characteristics.

6) The After sales service and maintenance of subject equipment shall be looked after by your representative Gilbarco Veeder Root India Pvt. Ltd., PDP Manufacturing Facility SF No-628/2 & 627/2, W-4-Coimbatore Campus, Eachanari, Chettipalayam Road, Malumichampatti, Coimbatore 641 021

**Conditions of the Approval:-**

This component is approved for installation in non hazardous areas (safe area) only.

The approval for above equipment is subject to validity of Production Quality Assurance Notification TUV 98 ATEX 1374 Q.

This approval also covers the permissible variations as approved under the TUV NORD CERT GmbH test reports referred above. This approval is liable to be cancelled if any of the conditions of the approval is violated or not complied with . The approval may also be amended or withdrawn at any time, if considered necessary in the interest of safety.

The field performance report from actual users/your customers of the subject equipment may please be collected and furnished to this office for verification and record on annual basis.

The Approval is Valid upto **31/12/2025**

Yours faithfully,

**(Ninad Dattaram Gawade)**  
**Dy. Controller of Explosives**  
**For Chief Controller of Explosives**  
**Nagpur**

Copy to :

1. Jt. Chief Controller of Explosives, South Circle Office, CHENNAI
2. Gilbarco Veeder Root India Pvt. Ltd.,PDP Manufacturing Facility SF No-628/2 & 627/2, W-4-Coimbatore Campus, Eachanari, Chettipalayam Road, Malumichampatti, Coimbatore 641 021

**for Chief Controller of Explosives**  
**Nagpur**

(For more information regarding status,fees and other details please visit our website <http://peso.gov.in>)

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**Zertifikat Nr. / Certificate No / Certificat N° / Certificato n.**  
**Z-VRMS-01**

**FAFNIR GmbH**  
**Schnackenburgallee 149 c**  
**22525 Hamburg**  
**Deutschland / Germany / Allemagne / Germania**

bestätigt, dass die  
confirms that the  
confirme que  
conferma che il

**automatische Überwachungseinrichtung**  
**automatic monitoring system**  
**l'appareil de surveillance automatique**  
**dispositivo di monitoraggio automatico**  
**VAPORIX**

für Gasrückführsysteme auf die Einhaltung der Anforderungen in EN 16321-1:2013, Anhang D von der Prüfstelle  
for vapour recovery systems has been tested for compliance with the requirements in EN 16321-1:2013, Annex D by the testing laboratory  
pour les systèmes de récupération des vapeurs pour la conformité aux exigences de la norme EN 16321-1:2013, annexe D a été testé par le laboratoire d'essai  
per i sistemi di recupero dei vapori è stato testato dal laboratorio di prova

**TÜV SÜD Industrie Service GmbH, Westendstraße 199, 80686 München, Deutschland / Germany / Allemagne / Germania**

gemäß Zertifikat AM VR2-1507-137 EU überprüft wurde. Das System mit den Systemkomponenten  
in accordance with certificate AM VR2-1507-137 EU. The system with the system components  
conformément au certificat AM VR2-1507-137 EU. Le système avec ses composants  
in conformità ai requisiti della norma EN 16321-1:2013, allegato D, in conformità al certificato AM VR2-1507-137 EU. Il sistema con il

**Messwertgeber / Transmitter / Capteur de mesure / Trasduttore di misura**  
**Messauswertung / Evaluation Unit / Unité d'analyse / Unità di analisi delle misure**

**VAPORIX-Flow**  
**VAPORIX-Control**

ist für alle Arten von Gasrückführungssystemen geeignet. Die Systemkomponenten werden hergestellt von  
is suitable for all types of vapour recovery systems. The system components are manufactured by  
est adapté à tous les types de systèmes de récupération des vapeurs. Les composants du système sont fabriqués par  
a tutti i tipi di sistemi di recupero dei vapori. I componenti del sistema sono prodotti da

**VAPORIX-Flow**  
**VAPORIX-Control**

**FAFNIR GmbH**  
**FAFNIR GmbH**

Alle Bewertungen werden von VAPORIX-Control ausgeführt.  
All assessments are performed by VAPORIX-Control.  
Toutes les évaluations sont effectuées par VAPORIX-Control.  
Tutte le valutazioni sono eseguite da VAPORIX-Control.

Die Abschaltung, ausgelöst durch VAPORIX-Control und eingestellt durch dessen Hersteller, beträgt  
The deactivation, triggered by VAPORIX-Control and set by its manufacturer, is at  
L'arrêt, déclenché par le VAPORIX-Control et réglé par son fabricant, est  
Lo spegnimento, innescato da VAPORIX-Control e impostato dal produttore, è

**mindestens / least / d'au moins / almeno**  
**maximal / maximum / au maximum de / al massimo a**

**72 h**  
**168 h**

Die Abschaltzeit in Stunden und der Ländercode sind dauerhaft auf dem Gehäuse vom VAPORIX-Control gekennzeichnet.  
The deactivation time in hours and the country code are permanently marked on the housing of the VAPORIX-Control.  
Le temps d'arrêt en heures et le code du pays sont marqués en permanence sur le boîtier du VAPORIX-Control.  
L'ora di spegnimento in ore e il codice paese sono contrassegnati in modo permanente sull'alloggiamento del VAPORIX-Control.

Diese automatische Überwachungseinrichtung entspricht der Richtlinie 2009/126/EG zuletzt geändert durch Richtlinie 2014/99/EU.  
This automatic monitoring system complies with Directive 2009/126/EC as last amended by Directive 2014/99/EU.  
Cet appareil de surveillance automatique est conforme à la directive 2009/126/CE modifiée en dernier lieu par la directive 2014/99/EU.  
Questo dispositivo di monitoraggio automatico è conforme alla direttiva 2009/126/CE, modificata da ultimo dalla direttiva 2014/99/UE.

Hamburg, 27.06.2019

Ort, Datum / Place, Date / Lieu, Date / Luogo, data

  
Geschäftsführer / Managing Director / Gérant / Direttore Generale: René Albrecht

Zertifikat Nr. / Certificate No / Certificat N° / Certificato n.

**Z-VRMS-02**

**FAFNIR GmbH**

**Schnackenburgallee 149 c**

**22525 Hamburg**

**Deutschland / Germany / Allemagne / Germania**

bestätigt, dass die  
confirms that the  
confirme que  
conferma che il

**automatische Überwachungseinrichtung mit Korrekturfunktion**  
**automatic monitoring system with corrective adjustment**  
**l'appareil de surveillance automatique avec fonction de correction**  
**dispositivo di monitoraggio automatico con funzione di correzione**

**VAPORIX + PCM**

für Gasrückführsysteme auf die Einhaltung der Anforderungen in EN 16321-1:2013, Anhang D von der Prüfstelle  
for vapour recovery systems has been tested for compliance with the requirements in EN 16321-1:2013, Annex D by the testing laboratory  
pour les systèmes de récupération des vapeurs pour la conformité aux exigences de la norme EN 16321-1:2013, annexe D a été testé par le laboratoire d'essai  
per i sistemi di recupero dei vapori è stato testato dal laboratorio di prova

**TÜV SÜD Industrie Service GmbH, Westendstraße 199, 80686 München, Deutschland / Germany / Allemagne / Germania**

gemäß Zertifikat AM VR2-1507-138 EU überprüft wurde. Das System mit den Systemkomponenten  
in accordance with certificate AM VR2-1507-138 EU. The system with the system components  
conformément au certificat AM VR2-1507-138 EU. Le système avec ses composants  
in conformità ai requisiti della norma EN 16321-1:2013, allegato D, in conformità al certificato AM VR2-1507-138 EU. Il sistema con il

**Messwertgeber / Transmitter / Capteur de mesure / Trasduttore di misura**  
**Messauswertung / Evaluation Unit / Unité d'analyse / Unità di analisi delle misure**  
Korrektursteuermodul / Correcting Control Module / Module de commande corrective / Modulo di controllo della correzione

**VAPORIX-Flow**  
**VAPORIX-Control**  
**VAPORIX-PCM**

ist für alle Arten von Gasrückführungssystemen geeignet. Die Systemkomponenten werden hergestellt von  
is suitable for all types of vapour recovery systems. The system components are manufactured by  
est adapté à tous les types de systèmes de récupération des vapeurs. Les composants du système sont fabriqués par  
a tutti i tipi di sistemi di recupero dei vapori. I componenti del sistema sono prodotti da

**VAPORIX-Flow**  
**VAPORIX-Control**  
**VAPORIX-PCM**

**FAFNIR GmbH**  
**FAFNIR GmbH**  
**FAFNIR GmbH**

Alle Bewertungen werden von VAPORIX-Control ausgeführt. Das Korrektursteuermodul VAPORIX-PCM ist ein Zusatzgerät.  
All assessments are performed by VAPORIX-Control. The correction control module VAPORIX-PCM is an auxiliary device.  
Toutes les évaluations sont effectuées par VAPORIX-Control. Le module de commande de correction VAPORIX-PCM est un dispositif auxiliaire.  
Tutte le valutazioni sono eseguite da VAPORIX-Control. Il modulo di controllo della correzione VAPORIX-PCM è un dispositivo ausiliario.

Die Abschaltung, ausgelöst durch VAPORIX-Control und eingestellt durch dessen Hersteller, beträgt  
The deactivation, triggered by VAPORIX-Control and set by its manufacturer, is at  
L'arrêt, déclenché par le VAPORIX-Control et réglé par son fabricant, est  
Lo spegnimento, innescato da VAPORIX-Control e impostato dal produttore, è

**mindestens / least / d'au moins / almeno**  
**maximal / maximum / au maximum de / al massimo a**

**72 h**  
**168 h**

Die Abschaltzeit in Stunden und der Ländercode sind dauerhaft auf dem Gehäuse vom VAPORIX-Control gekennzeichnet.  
The deactivation time in hours and the country code are permanently marked on the housing of the VAPORIX-Control.  
Le temps d'arrêt en heures et le code du pays sont marqués en permanence sur le boîtier du VAPORIX-Control.  
L'ora di spegnimento in ore e il codice paese sono contrassegnati in modo permanente sull'alloggiamento del VAPORIX-Control.

Diese automatische Überwachungseinrichtung entspricht der Richtlinie 2009/126/EG zuletzt geändert durch Richtlinie 2014/99/EU.  
This automatic monitoring system complies with Directive 2009/126/EC as last amended by Directive 2014/99/EU.  
Cet appareil de surveillance automatique est conforme à la directive 2009/126/CE modifiée en dernier lieu par la directive 2014/99/EU.  
Questo dispositivo di monitoraggio automatico è conforme alla direttiva 2009/126/CE, modificata da ultimo dalla direttiva 2014/99/UE.

Hamburg, 27.06.2019

Ort, Datum / Place, Date / Lieu, Date / Luogo, data  
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Geschäftsführer / Managing Director / Gérant / Direttore Generale: René Albrecht

**Zertifikat Nr. / Certificate No / Certificat N° / Certificato n.**  
**Z-VRMS-03**

**FAFNIR GmbH**  
**Schnackenburgallee 149 c**  
**22525 Hamburg**  
**Deutschland / Germany / Allemagne / Germania**

bestätigt, dass die  
confirms that the  
confirme que  
conferma che il

**automatische Überwachungseinrichtung mit zentraler Auswertung**  
**automatic monitoring system with central evaluation**  
**l'appareil de surveillance automatique avec évaluation centrale**  
**dispositivo di monitoraggio automatico con valutazione centrale**  
**VAPORIX + PSS 5000**

für Gasrückführsysteme auf die Einhaltung der Anforderungen in EN 16321-1:2013, Anhang D von der Prüfstelle  
for vapour recovery systems has been tested for compliance with the requirements in EN 16321-1:2013, Annex D by the testing laboratory  
pour les systèmes de récupération des vapeurs pour la conformité aux exigences de la norme EN 16321-1:2013, annexe D a été testé par le laboratoire d'essai  
per i sistemi di recupero dei vapori è stato testato dal laboratorio di prova

**TÜV SÜD Industrie Service GmbH, Westendstraße 199, 80686 München, Deutschland / Germany / Allemagne / Germania**

gemäß Zertifikat AM VR2-1507-139 EU überprüft wurde. Das System mit den Systemkomponenten  
in accordance with certificate AM VR2-1507-139 EU. The system with the system components  
conformément au certificat AM VR2-1507-139 EU. Le système avec ses composants  
in conformità ai requisiti della norma EN 16321-1:2013, allegato D, in conformità al certificato AM VR2-1507-139 EU. Il sistema con il

|   |                        |
|---|------------------------|
| <b>Messwertgeber / Transmitter / Capteur de mesure / Trasduttore di misura</b>                              | <b>VAPORIX-Flow</b>    |
| <b>Messauswertung / Evaluation Unit / Unité d'analyse / Unità di analisi delle misure</b>                   | <b>VAPORIX-Control</b> |
| <b>Vorplatzsteuerung / Forecourt Controller / Contrôleur d'avant-cour / Unità di controllo del piazzale</b> | <b>PSS 5000</b>        |

ist für alle Arten von Gasrückführungssystemen geeignet. Die Systemkomponenten werden hergestellt von  
is suitable for all types of vapour recovery systems. The system components are manufactured by  
est adapté à tous les types de systèmes de récupération des vapeurs. Les composants du système sont fabriqués par  
a tutti i tipi di sistemi di recupero dei vapori. I componenti del sistema sono prodotti da

|                        |                    |
|------------------------|--------------------|
| <b>VAPORIX-Flow</b>    | <b>FAFNIR GmbH</b> |
| <b>VAPORIX-Control</b> | <b>FAFNIR GmbH</b> |
| <b>PSS 5000</b>        | <b>DOMS ApS</b>    |

Alle Bewertungen werden von PSS 5000 ausgeführt. VAPORIX-Control liefert Daten an PSS 5000.  
All assessments are performed by PSS 5000. VAPORIX-Control delivers data to PSS 5000.  
Toutes les évaluations sont effectuées par PSS 5000. VAPORIX-Control fournit les données au PSS 5000.  
Tutte le valutazioni sono eseguite da PSS 5000. VAPORIX-Control fornisce i dati a PSS 5000.

Die Abschaltung, ausgelöst durch PSS 5000 und eingestellt durch dessen Hersteller, beträgt  
The deactivation, triggered by PSS 5000 and set by its manufacturer, is at  
L'arrêt, déclenché par le PSS 5000 et réglé par son fabricant, est  
Lo spegnimento, innescato da PSS 5000 e impostato dal produttore, è

|   |              |
|---|--------------|
| <b>mindestens / least / d'au moins / almeno</b>         | <b>72 h</b>  |
| <b>maximal / maximum / au maximum de / al massimo a</b> | <b>168 h</b> |

Die Abschaltzeit in Stunden und der Ländercode sind dauerhaft auf dem Gehäuse vom PSS 5000 gekennzeichnet.  
The deactivation time in hours and the country code are permanently marked on the housing of the PSS 5000.  
Le temps d'arrêt en heures et le code du pays sont marqués en permanence sur le boîtier du PSS 5000.  
L'ora di spegnimento in ore e il codice paese sono contrassegnati in modo permanente sull'alloggiamento del PSS 5000.

Diese automatische Überwachungseinrichtung entspricht der Richtlinie 2009/126/EG zuletzt geändert durch Richtlinie 2014/99/EU.  
This automatic monitoring system complies with Directive 2009/126/EC as last amended by Directive 2014/99/EU.  
Cet appareil de surveillance automatique est conforme à la directive 2009/126/CE modifiée en dernier lieu par la directive 2014/99/EU.  
Questo dispositivo di monitoraggio automatico è conforme alla direttiva 2009/126/CE, modificata da ultimo dalla direttiva 2014/99/UE.

Hamburg, 27.06.2019

Ort, Datum / Place, Date / Lieu, Date / Luogo, data  
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Geschäftsführer / Managing Director / Gérant / Direttore Generale: René Albrecht



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Web: [www.fafnir.com](http://www.fafnir.com)

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