VAPORIX-PCM

Corrective control module
for connection to VAPORIX-Control

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VAPORIX-PCM

Principle of operation

VAPORIX-PCM (Pulse Correction Module) is a control module for pulse controlled vapour recovery systems. It can compensate physically caused drift effects of the vapor recovery rate (e.g., by temperature variations or swelling hoses and seals). VAPORIX-PCM receives the information of necessary corrections from VAPORIX-Control.

VAPORIX-Control saves the data of each refuelling in an internal history database. By analysing these history data it is able to recognize drift effects early and to pass corrective information to the VAPORIX-PCM. This allows generating corrected control pulses for the vapor recovery system to compensate the drift effects.

The vapor recovery system is then no longer controlled by the fuel flow pulses themself, but by the altered control pulses generated by the VAPORIX-PCM. The advantage of the PCM compared to a regulated system is the distinction between inevitable small variations of the vapour recovery rate and unacceptable errors in the vapour recovery system. The detection of these errors using the analysis of the stored data enables the identification of necessary maintenance measures according to national Immission Control Acts (in Germany Bundesimmissions-schutzverordnung BImSchV).

![Diagram of operating principle of the corrected control](image)

Figure 1: Operating principle of the corrected control
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 sensor and the control 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 information 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 sensor and the control 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 these operating instructions.
- VAPORIX-Flow and VAPORIX-Control are subject to the National construction approval and are therefore only allowed to be repaired by FAFNIR or companies authorized by FAFNIR. In case of failure, always the entire sensor or the entire control unit must be replaced.
- The control 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 manual are labelled as follows:

⚠️ If these safety instructions are not observed, it may result in the risk of accident or damages to the VAPORIX system.

riefcase Useful information designed to ensure continued and correct operation of the system and to make your work easier.
Retrofitting of VAPORIX-PCM

The corrective control with VAPORIX-PCM is suitable for both new installations and retrofit:

- Due to its very small dimension, it can be used even in small spaces.
- No replacement of components of the existing vapor recovery system is required.
- No access to the calibrated area of the petrol pump is required.
- Suitable for use with all current, pulse controlled vapour recovery systems. There is no dependence on manufacturer-specific features (e.g. calibration data).
- Easy to connect and power supplied by the VAPORIX-Control.
- It can be retrofitted to an existing VAPORIX monitoring system without replacement of components.
- Also suitable for special requirements such as throttling the vapour recovery rate or deactivating the vapour recovery system for refuelling of On-board Refuelling Vapour Recovery (ORVR) vehicles. For this application a special firmware version for VAPORIX-Control is required.

Design and connectivity

Figure 2: Connectors and indicators of VAPORIX-PCM
• Operation Indicator - green LED  
  Constantly flashing every second: Normal operation.  
  Repeated 1 short flash: Uncorrected operation at dry measurement (dongle position 7).

• Fault indicator - red LED  
  Repeated 1 short flash: Pulse frequency cannot be generated, since outside valid range of 2.00 Hz ... 200.00 Hz.  
  Repeated 2 short flashes: Receipt of unknown command via RS485.  
  Repeated 3 short flashes: Incorrect or defective RS485 data transmission.  
  Repeated 4 short flashes: No data received since 60 seconds.

• Pulse output indicators - yellow LED  
  Indicate the pulse generation on side A and B.

### Connection assignment

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<td>8</td>
<td>Pulse side A</td>
<td>Optocoupler Output</td>
<td>Collector</td>
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<td>Emitter</td>
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<td>6</td>
<td>Pulse side B</td>
<td>TTL Output</td>
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<td>Optocoupler Output</td>
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### Installation and set up

• VAPORIX-PCM corrects the drift of the vapour recovery rate and enables the detection of serious faults of the vapour recovery system. Before installation be sure to check whether the vapour recovery system is functioning properly. Otherwise, it should be repaired and/or be readjusted.

⚠️ All installation work must be performed with the power supply disconnected. The relevant safety regulations have to be observed.
• In VAPORIX-Control at least the firmware version 1.36 or higher must be installed to operate the VAPORIX-PCM. If necessary, update the firmware of the VAPORIX-Control. The firmware update can be carried out on-site with a laptop.

• Mount VAPORIX-PCM close to the VAPORIX-Control.

• When wiring the VAPORIX-Control only the cable supplied is to be used.

• For wiring the vapor recovery system with VAPORIX-PCM a standard unscreened cable is sufficient. If a shielded cable is used (e.g. for vapor recovery systems with very high impedance inputs), which is not connected to ground (potential equalization or protection ground), then it can be connected to GND connections (1, 5) of the VAPORIX-PCM. If the shield is connected to ground potential, it must not be connected to VAPORIX-PCM, but it has to be left open.

• VAPORIX-PCM has to be wired to VAPORIX-Control and the vapor recovery system in accordance to Figure 3. The screws of the connection terminals of the VAPORIX-PCM are protected against falling out. For connecting use a screwdriver with suitable width of maximum 2.3 mm, as the mechanical protection can be damaged or destroyed by too large screwdrivers.

Figure 3: Wiring
• Power up the system again. VAPORIX-PCM then reports automatically via the RS485 interface to VAPORIX-Control. No further configuration is required.

• For each side of the dispenser perform a test fuelling, to ensure that the vapour recovery system works. Alternatively, you can also wait for customer vehicle refuellings and check the result by reading the history data of the VAPORIX-Control.

Special Notes

• The VAPORIX system determines the correction values from the stored history data. However, after the first installation of the system these values are not available. Therefore, more than four valid refuellings are necessary on each side of the dispenser, until the correction values have been stabilized.

• If an error in the vapour recovery system has activated an alarm, the VAPORIX-Control should be reset with the VAPORIX-Service-Dongle after the remedy of the cause of the error. As a consequence the correction values are reset as well. Subsequently, more than four valid refuellings are necessary on each side of the dispenser, until the correction values have been stabilized.

• During a dry measurement (dongle position 7) the correction function is turned off for both sides so that the vapour recovery is controlled with the original, uncorrected pulse frequency. The reactivation of the corrected mode automatically happens when you log out the dongle or after 30 seconds when the dongle is removed.

• During the adjustment of the vapor recovery system with an operating unit (e.g. Bürkert) no pulses are generated, since the operating unit controls the vapor recovery directly.

• In other forms of adjustment (e.g. wet calibration) the pulses for controlling the vapor recovery can be necessary. In these cases, the correction function must be disabled using the dongle (dongle position 7).

• Alternatively to the TTL outputs shown in Figure 3, also galvanically isolated pulses of higher voltage can be generated via the optocoupler outputs (external resistor and voltage source is required). To avoid damaging the VAPORIX-PCM, the maximum switching voltage of 28 V and the maximum switching current of 10 mA must not be exceeded. For this option a consultation must be hold with the manufacturer of the vapor recovery system or of the dispenser.
Technical data

Power supply: 5 Vdc and ≤ 30 mA (from VAPORIX-Control), internal reverse voltage protection up to 30 Vdc, screw terminal for max. 1 mm². Cable for the connection to the VAPORIX-Control is included.

Pulse outputs per side: 1 x TTL compatible (4.7 V / 2 mA), short circuit protected.

1 x Optocoupler for generating galvanically isolated pulses via external voltage supply, collector and emitter open, max. switching current 10 mA, max. switching voltage 28 Vdc, internal reverse polarity protection up to 30 Vdc.

Screw terminals for max. 1 mm².

Pulse frequencies: 2.0 Hz ... 200.00 Hz
Corresponds to 2.4 l/min (at 50 pulses/l) to 60.0 l/min (at 200 pulses/l).

Serial interface: RS485, 4-wire, 10-pin connector, cable for VAPORIX-Control connection is included.

Operation indication: green LED
Fault indication: red LED
Pulse output indication: yellow LED
Operating temperature range: -20 ºC to +70 ºC
Dimensions (L x W x H): 105 mm x 24 mm x 47 mm
Housing: Module carrier for DIN rail mounting
EU-Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de Conformité

FAFNIR GmbH
Bahnenfelder Straße 19
22765 Hamburg / Germany

explains as producer under sole responsibility that the product
déclare sous sa seule responsabilité que le produit

Modul zur korrekten Steuerung
Corrective Control Module
Module de commande corrective

VAPORIX-PCM

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

<table>
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<tr>
<th>Date</th>
<th>Description</th>
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<td>Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Electronikgeräten</td>
<td>RoHS</td>
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<td>2011/65/EU</td>
<td>Restriction of the use of certain hazardous substances in electrical and electronic equipment</td>
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<td>2011/65/EU</td>
<td>Limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques</td>
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through the application of the harmonized standards
par l’application des normes

RoHS / RoHS / RoHS
EMV / EMC / CEM

EN 50581:2012
EN 61326-1:2013

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

Störausbreitung / Emission / Émission
Störfestigkeit / Immunity / D’immunité

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

Ort, Datum / Place, Date / Lieu, Date

Geschäftsführer / Managing Director / Gérant: René Albrecht

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FAFNIR GmbH • Bahnenfelder Str. 19 • 22765 Hamburg • Telefon: +49 / (0) 40 / 39 82 07-0 • Telefax: +49 / (0) 40 / 390 63 39
Für Gasrückführsysteme auf die Einhaltung der Anforderungen in EN 16321-1:2013, Anhang D von der Prüfstelle für Vapour recovery systems has been tested for compliance with the requirements in EN 16321-1:2013, Annex D by the testing laboratory für die systeme 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 für i sistemi di recupero dei vaporii 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 conforme au certificat AM VR2-1507-138 EU. Le système avec ses composants in conformité ai requis 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 Korrektursteuermodule / Correcting Control Module / Module de commande corrective / Mascaliu di controllo della correzione

VAPORIX-Flow VAPORIX-Control VAPORIX-PCM

ist für alle Arten von Gasrückführsystemen 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 vaporii. I componenti del sistema sono prodotti da

VAPORIX-Flow VAPORIX-Control VAPORIX-PCM

Alle Bewertungen werden von VAPORIX-Control ausgeführt. Das Korrektursteuermodule 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 auxiliare.

Die Abschaltung, ausgelost durch VAPORIX-Control und eingestellt durch dessen Hersteller, beträgt Die 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 72 h
maximal / maximum / au maximum de / al massimo a 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.


Hamburg, 27.06.2019

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