HORN
TECALEMIT

HDM eco

Rauchen verboten
Motor u. Fremdheizung abstellen
Abgabe nur in geeignete Geräte

Operating manual

HDM 60 eco / HDM 80 eco

Item. No.: 110 700 860, 110 700 880

Important!

The operating manual is always to be read before commissioning the equipment. No warranty claim will be granted for faults and damage to the equipment arising from insufficient knowledge of the operating manual.

Copyright

Service Hotline   +49 1805 900 301
(0,14 €/Min: on the German landline network, Mobile telephone max. 0,42 €/Min.)

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Table of content

1   Safety instructions

The device is a state of the art piece of equipment and has been constructed according to recognised safety specifications. It is nevertheless possible that use of the device will present hazards to the operator or to third parties, or may damage the device or other property. It is therefore essential to act in accordance with these safety instructions, and in particular with those sections identified as warnings.

Warning notices and symbols

In the operating manual, the following signs are used for highlighting important information.

☛   **Special information for economical use of the equipment.**

❗   **Special information or "dos and don'ts" for damage prevention.**

⚠   **Information or "dos and don'ts" for the prevention of damage to persons or equipment.**

Appropriate use

❗   The device may only be used if it is in perfect condition, and then only for its intended purpose, in compliance with all safety regulations, with an awareness of the potential risks, and according to the operating manual. Any faults that may impair the safety must be rectified immediately.

⚠   The device and its components are only to be used for handling the liquids listed and the purpose described. Using the machine for any other purpose would constitute inappropriate use. The manufacturer is not responsible for any loss arising as a result of this, the risk for this is borne only by the operating company.

Organisational measures

❗   This operating manual should always be kept readily available at the site of operation! Each person concerned with the assembly, commissioning, maintenance and operation of the equipment must have read and understood the entire operating manual. It is essential that the type plate and the warning notices attached to the device are observed, and are maintained in a fully readable condition.

Qualified personnel

❗   The operating, maintenance and assembly personnel must be appropriately qualified for their work. The areas of responsibility, competences and supervision of the personnel must be precisely regulated by the operating company. If the personnel do not have the required knowledge, they must be trained and instructed. The operating

company must also ensure that the contents of the operating manual are properly understood by the personnel.

Waters protection

⚠ The device has been designed to handle water hazardous substances. The regulations on the operating place (e.g. Water Resources Act WHG, = ordinance on installations for handling of substances hazardous to water VAwS) must be adhered to.

Hydraulics

⚠ Only persons with special knowledge and experience with hydraulic systems may carry out work on hydraulic parts and equipment. All lines, hoses and screw joints should regularly be checked for leaks and visible external damage. Any damage must be rectified immediately. Any oil spurting out can cause injuries and fire.
The relevant safety regulations for the product must be followed when handling oils, greases or other chemical substances!

Maintenance and Service

⚠ According to the regulations of the water resources law only authorized services may work on devices for flammable and/or water endangering substances. During such works, appropriate tools are to be used (avoid sparking). Before any kind of work on the device, all fuel lines are to be completely emptied and aerated.
Do not make any changes. Modifications or additions to the device which may affect the safety cannot be carried out without consent of the manufacturer. Exclusively genuine spare parts made by the manufacturer may be used.

Electric power

⚠ Work on the electrical equipment may only be carried out by a qualified electrician or by trained persons under the guidance and supervision of a qualified electrician according to electro-technical guidelines.Machine or system components, on which inspection, maintenance or repair work is to be carried out must be de-energised.

2   Technical description

2.1   Description / Intended use

The HDM eco dispenser is an electrically driven dispenser for the refuelling of motor vehicles and the filling of containers with diesel fuel and fuel oil el.

⚠️ **The dispenser may be operated exclusively with diesel fuel according to DIN EN 590 or DIN 51628, biodiesel (RME) according to DIN EN 14214 and fuel oil EL according to DIN 51603-1. In particular, combustible liquids with a flash point below 55°C or liquids with a temperature above their flash point must not be pumped!**

The device comprises the delivery system fully mounted in a sheet steel housing. Components are the feed pump, a flow meter, the dispensing hose with automatic nozzle and an automatic dispenser for controlling the dispensing procedure.

The built-in HDA eco automatic dispenser is optimised for the administration of small and medium-sized vehicle fleets and enables the administration of up to 100 users/vehicles.

The built-in pumping equipment is designed such that reliable operation is achieved with a maximum annual consumption of 150,000 litres (HDM 60 eco) or 200,000 litres (HDM 80 eco) of fuel. Users with higher annual consumption rates should select an appliance from the Horn/Tecalemit dispenser range that is better suited to their application.

2.2   Versions

The HDM eco dispenser is available in the following versions:
HDM 60 eco   Item.-No.: 110 700 860
HDM 80 eco   Item.-No.: 110 700 880

2.3   Technical data

	HDM 60 eco	HD 80 eco
Dimensions (WxHxD)	approx. 410 x 1410 x 275mm	
Media temperature	-10 °C to +35°C	
Ambient temperature	-20°C to +55°C	
Suction connection	G1" internal thread	G1¼" flange with internal thread
Nominal suction height	3.5m	
Rated delivery rate (HDM 60 eco / HDM 80 eco)	approx. 55 L/min *	approx. 75 L/min *
Voltage	230V 50Hz	
Power	0.5 kW	0.8 kW
Protection class	IP 54	
Viscosity range	> 1 mPa s to 20 mPa s at 20°C	

* depending on system and viscosity

2.4 Dimensional drawing

Schloss
lock - serrure

Öffnungen für Saugleitung u. elektrischen Anschluss
Openings for suction pipe and electric connections -
Ouvertures pour tube d'aspiration et branchement électrique

Drehgelenk am Wanddurchlass
Swivel at wall opening - Pivot au passage mural

Z (1 : 2)

Öffnung für elektrischen Anschluss
Opening for electric connection -
Ouverture pour branchement électrique

Öffnung für Saugleitung
Opening for suction tube -
Ouverture pour tube d'aspiration

Bohrungen für Bodenbefestigung
Holes for basement anchorage -
Perçage pour ancrage au sol

D-D (2 : 7)

G1 1/4" Saugleitung
Suction pipe G1 1/4" -
Tube d'aspiration G1 1/4"
(HDM 80 eco)

Tankautomat HDA eco
mit Folientastatur und zweizeiligem Display
Tank automat HDA eco with keyboard and two line display -
Automate de distribution HDA eco avec clavier et écran 2 lignes

Automatik Zapfventil A2010
mit Drehgelenk
Automatic nozzle A2010 with swivel -
Pistolet automatique A2010 avec liaison pivot

USB Anschluss
USB port - Port USB

Kabelkanal
cable channel - conduit de câbles

Ovalradzähler
Oval gear flow meter - Débitmètre

Zapfschlauch - Flexible de distribution
Discharge hose
(DN25 - HDM 80 eco / DN 19 - HDM 60 eco)

Förderpumpe HDM 80 eco
mit elastischer Lagerung
Transfer pump on elastic support -
Pompe de transfert sur palier flottant

G1" Saugleitung
Suction pipe G1" -
Tube d'aspiration G1"
(HDM 60 eco)

Gehäuse aus verzinktem Stahlblech
Front und Rückwand: verzinkt und pulverbeschichtet
Casing out of galvanized steel plate - Coffre en tôle d'acier zinguée

MB-16650001-B
Maßblatt HDM eco
Dimensional Sheet HDM eco
HORN GMBH & CO. KG
D-24837 FLENSBURG

2.5 Accessories

The following accessories are available for the HDM eco dispenser:

Base frame		233400373
Float switch		233400165
Level probe interface	(Please indicate the serial number & year of manufacture of the dispenser when ordering for retrofitting)	233400160
Activation code fee	(activation by telephone when retro-fitting the level probe)	233400470
Level probe 200 mbar	(Tank height max. 2m; cable length 5m)	224010000
Level probe 300 mbar	(Tank height max. 3m; cable length 5m)	224020000
Level probe 500 mbar	(Tank height max. 5m; cable length 7m)	224050000
Terminal box with pressure compensation filter	(for extending the cables of the level probes)	224061000
RS422 interface	(Plug-in PCB; please indicate the serial number & year of manufacture of the dispenser when ordering for retrofit-ting)	233400170
RS232 interface		233400190
TAG	(Key fob for driver/vehicle identifica-tion)	233400200
USB stick with HD Manager eco		616700001
HD Manager – basic version		233500351
HD Manager – full version		233500402
Filter including filter holder	(Installation in pressure line; 30 mm including water absorber)	233400180
Return pipe for over ground tanks		233400195

3 Assembly instructions

Before assembling and commissioning the equipment, check that it is complete and undamaged.
The rules and regulations of the Ordinance on Industrial Safety and Health are to be observed.

⚠ **Commissioning of incomplete or damaged equipment is not allowed!**

3.1 Place of installation

The HDM eco type dispenser is designed for outdoor operation. The place of installation must be chosen such that harmful environmental influences – such as sea water – cannot attack the components.

The dispenser satisfies the legal water and commercial requirements of the German Water Resources Act (Wasserhaushaltsgesetz – WHG) and the German Ordinance on Installations for Handling of Substances Hazardous to Water (Verordnung über Anlagen im Umgang mit wassergefährdenden Stoffen – VAwS). The local regulations for installation and operation as well as any official approvals are to be observed or obtained by the operator.

⚠ **Installation, commissioning and maintenance are to be carried out by a specialist company as per WHG §19I.**

The equipment is to be installed and operated on even and adequately stable floor. For space requirements, see the technical data.

⚠ **The equipment must not be used in explosive areas!**

3.2 Opening the door

For installation and servicing tasks, the door of the column can be opened. Open the lock by turning the key to the right.

If there is insufficient space, the door can be unhinged. In order to do this, unscrew the upper bearing pin and tip the door forwards, then upwards to remove.

3.3 Fastening to the floor

The dispenser has 4 holes in the base frame. These should be used to fasten the dispenser.

Depending upon structural conditions, the dispenser can be fastened with 4 heavy-duty dowels or M8 screws. The optionally available base frame can also be used (see 2.5 "Accessories").

3.4 Suction line

The suction line in the dispenser is equipped with a G1" internal thread (HDM 60 eco) or a G1¼" flange (HDM 80 eco).

The dispenser is provided for connection to above-ground or underground tanks. The position of the suction line and the housing openings can be taken from the dimensional drawing (see section 2.4). For connection to an above-ground tank, the blanking plugs must be removed from the prepared openings in the plinth panel at the rear side.

Installation of a corrugated pipe or similar compensating element between the pump flange and suction line is required for a strain-free connection. Otherwise, damage to the lines or excessive noise generation can not be excluded.

When installing the suction line care is to be taken that it does not come into contact with the housing parts.

The length of the suction pipe and the suction height have a considerable effect on the pumping capacity of the dispenser. In order to obtain the optimum pumping capacity of the dispenser, the suction line must be kept as short as possible.

⚠ **For all systems, pressure relief of the dispenser must be possible via the suction line. No non-return valve without pressure relief may be installed in the suction line.**

⚠️ **It must be ensured that no particles of dirt are able to enter the pump or the counter meter. For this reason, there is a suction filter installed in the suction line. If this must be removed for reasons of space, a comparable filter must be installed in the suction line at an appropriate location.**

⚠️ **It must be ensured by the customer that no rise in pressure above 0,5 bar is possible, for example, due to thermal expansion.**

⚠️ **In the case of above-ground tanks, a suitable anti-syphon valve must be installed by the customer.**

The nominal diameter of the suction line must be at least DN 32 (HDM 60 eco) or DN 50 (HDM 80 eco). Suctions lines with diameters of DN32 or DN 50 may not exceed 6 m in length. Larger pipe diameters are to be selected for longer suction lines. The suction height should be no more than 3.5 m.
In unfavourable combinations using long suction lines, high static suction lifts and large pipe diameters, it is possible that the supply pump is no longer able to draw up the medium independently. In such critical installations, the media must be drawn in with an external vacuum pump or the suction line must be filled. Appropriate connections must, if necessary, be made on site. In the event of questions with regard to laying the suction line, please contact our Service department.

3.5   Electrical connection

⚠️ **Work on the electrical equipment of the device may only be carried out by a qualified electrician or by trained persons under the guidance and supervision of a qualified electrician according to electro-technical guidelines.**

❗ **For trouble-free operation, an electrical connection from the distribution box with residual current circuit breaker must be selected!**

The electrical connection takes place according to the connection diagram in the appendix (see section 13).
For above-ground tank connection, openings for cable glands are provided in the plinth at the rear. A cut-out is provided in the base plate for an underground tank connection. See also "Dimensional drawing" (section 2.4).

3.5.1   Installation of the float switch

(optional)
It is possible to connect a float switch to the HDA eco automatic dispenser in order to prevent the tank from being pumped completely empty. This protects the pump against damage caused by dry running and prevents any dirt on the floor of the tank from being sucked in.

The float switch is not installed on delivery and must be mounted in the tank at the desired fill level by the installation company. The float switch must have normally closed contacts that open when the liquid level drops. A suitable float switch is available as an accessory (see section 2.5). The 'float switch' function must be activated in the HDA eco automatic dispenser (see section 5.3.5.1) and the float switch must be connected in accordance with the circuit diagram.

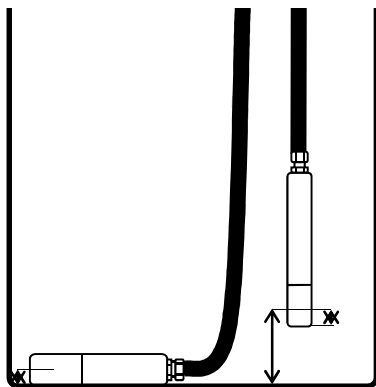### 3.5.2   Installation of the level probe

(optional)

It is possible to connect a level probe (4-20 mA) to the HDA eco automatic dispenser. This makes it possible to monitor the level of fuel in the tank on the HDA eco automatic dispenser and to switch the pump off when the adjustable minimum level is reached. This protects the pump against damage caused by dry running and prevents any dirt on the floor of the tank from being sucked in.

The 'level probe' function must be activated in the HDA eco automatic dispenser and the probe must be connected in accordance with the circuit diagram (see sections 5.3.5 & 13). This function should be activated on ordering the dispenser, but it can also be activated later. Subsequently, the automatic dispenser must be parameterised with the tank values (see section 5.3.5).

A suitable level probe must be selected with a measuring range adapted to the tank height. (See section 2.5 for suitable probes)

The level probe is not installed on delivery and must be mounted on the floor of the tank by the installation company. If the probe cable is extended, a terminal box with a pressure compensation element must be used (see section 2.5).

The sensor should be positioned horizontally at the lowest point of the tank so that the effective installation height (offset) is approx. 11mm above the bottom of the tank (see sketch). In particular cases it can be necessary to position the sensor suspended above the floor of the tank. Ten the offset for this tank must be entered in the corresponding input mask. If there is a difference between the level read off and measured the offset can be corrected accordingly.

Ensure that the sensor is at standstill during installation. A protective pipe with bleeding hole on the upper end is to be foreseen in case the sensor is to be installed near a filling or suction line.
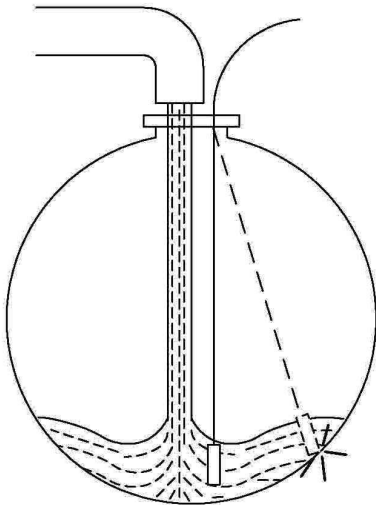
3.5.3 Retrofitting the level probe interface

It is possible to retrofit the optional level probe. Please contact HORN TECALEMIT Customer Service regarding this.

### 3.5.4 Connection of the RS232/RS422 interface

It is optionally possible to transmit data from the HDM eco to a PC. The HD Manager, HD Manager Basic or HD Manager eco PC software is required for this and the HDA eco must also be fitted with an additional PCB (socket modem) for the respective interface.
The PC can be connected via an RS232 or RS422 interface, depending on the local conditions:

3.5.4.1 RS232 connection

In this case interference-free data transmission is possible only up to a cable length of approx. 15 m (depending on the type and routing of the cable). A free RS232 interface (COM port) or a USB-to-RS232 adaptor is required on the PC and the RS232 socket modem must be plugged in on the HDM eco.
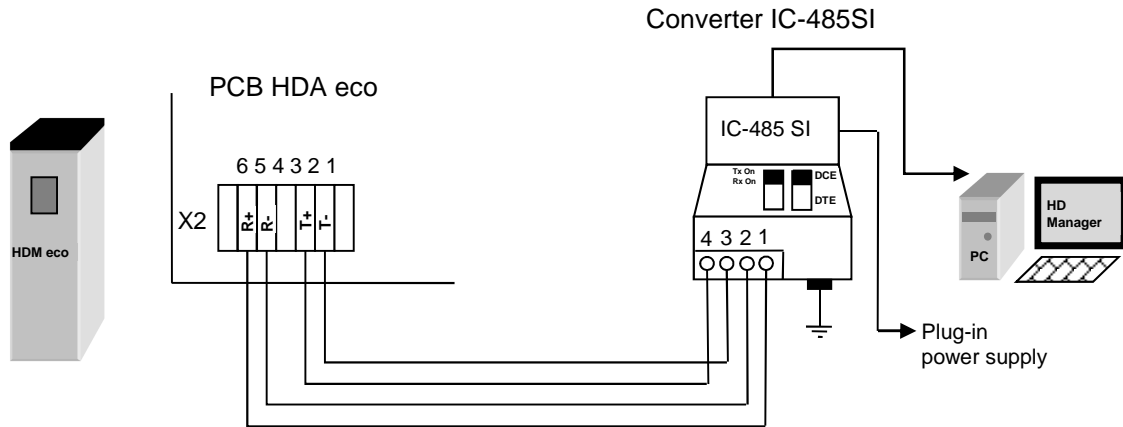Connection diagram
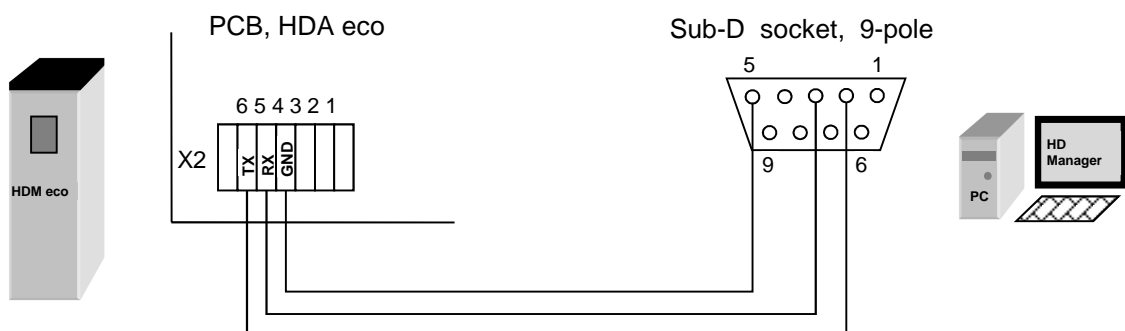
3.5.4.2   RS422 connection

In this case data transmission is possible up to a cable length of approx. 1200 m. An RS422-to-RS232 converter is required at the PC end and the RS422/RS485 socket modem must be plugged in on the HDM eco. The PC must have a free COM port.

Connection diagram

3.5.4.3   Retrofitting the RS232/RS422 interface

It is possible to retrofit the optional RS232/RS422 interfaces. Please contact HORN TECALEMIT Customer Service regarding this.

4   First steps - HDA eco

The HDA eco is equipped with an autonomously working refuelling data acquisition system, which permits the recording and subsequent processing of all refuelling processes.

For this, following entries are possible for every refuelling:

- Driver
- Vehicle
- Mileage
- Order

In the factory setting of the HDA eco, only the vehicle will be queried. *Vehicle no. 1* was already created with the code *"123"* so that a trial refuelling is possible.

Display (e.g.):

```
Vehicle:***
10:29   24.03.11
```

Refuelling can proceed after entering the numbers "1 2 3", confirming with "**ENTER**" and drawing the nozzle.

Display (e.g.):

```
789.8 L
```

5 Operation of the HDA eco

The user is guided through the operation of the HDA eco by a menu structure (shown in Appendix B:). The operating manual is orientated to this menu structure.

5.1 Switching on

After switching on the HDA eco, a function test runs (display test, program version display, memory test, real-time clock test). The automatic dispenser is in the "Dispensing" mode after switching on.

5.1.1 Entry of values

The operation of the automatic dispenser takes place mainly via keyboard. The following basic entries are possible depending on the input fields (Exceptions are treated in the corresponding sections):

a) Entry of numerical values (figures)
Entry is made via the number pad. Wrong entries can be deleted character by character with the "◄" key. Press "**ENT**" to confirm, "**EXIT**" to cancel. Where is it meaningful, a minus sign can be entered with the '►' key.

b) Entry of alphanumeric values (letters & numbers)
Entry of numbers is made via the number pad. The entry of letters and special characters is made via the keys "▲" and "▼"; confirm the character with the "►" key. The characters are arranged as follows: ' ', 'a' - 'z', 'ä', 'ö', 'ü', 'ß', 'A' - 'Z', '0' - '9', '-', '&', '.'
Wrong entries can be deleted character by character with the "◄" key. Press ,**ENT'** to confirm, ,**EXIT'** to cancel.

c) Selection of fixed settings
In many input fields only a selection of few alternatives is possible. These are preset and can be selected using the "◄" and "►" keys and confirmed via ,**ENT'**. Cancelling using ,**EXIT'**.

5.2 Refuelling mode

Refuelling can be carried out. Some of the necessary entries are optional. The querying of the inputs in the appropriate input screens as well as additional dispensing parameters can be specified in the menu item 'Dispensing options' (see section 5.3.1). Entering is cancelled when for more than 30 seconds no button is pushed.
The following steps are necessary to dispense fuel:

5.2.1 Driver identification (optional)

The driver is identified by the associated ID (code or transponder + optional PIN). The IDs are specified in the menu item 'IDs' (see section 5.3.3)

Display (e.g.):
```
Driver:***
10:29  24.03.03
```

A code with a maximum of 5 digits must be entered. A * appears on the display for each digit entered.
Entering leading zeros is not necessary.

A transponder tag can be used as ID instead of the code . Mixed operation (operator code and transponder tag) is possible; each ID may be assigned either a code or a transponder tag.
The transponder tag needs to have a distance of 2 – 5 cm to the reader. Acceptance is indicated by a short beep tone.

It is possible to additionally issue a PIN with a maximum of 5 digits for each ID (code or transponder), (see section 5.3.3.1.1).

If an incorrect code or an incorrect PIN is entered, or if a transponder tag is used that has not been released, input is disabled for a period of time that is extended with each subsequent incorrect entry.

Display (e.g.):

```
Pin:***
10:29  24.03.03
```

The current time is displayed in the lower line.
After dispensing, the dispensed amount from the last fuelling is displayed in the lower line for 15 minutes after dispensing ends.

Entry of the **master code** or the use of the master transponder switches to the **management operating mode**.

Master code factory setting: 99999. It is absolutely essential to change this code (see section 5.3.3.2)

5.2.1.1 Vehicle identification (optional)

The vehicle is identified by the associated ID (code or transponder + optional PIN) in the same way as the identification of the driver.

Display (e.g.):

```
Vehicle:***
10:29  24.03.03
```

5.2.1.2 Tank content display (optional)

It is possible to switch to the tank content display from the input screens for the driver or vehicle identification by pressing the '▼' button. The contents in percent, the measured level and the contents in litres are displayed. (Only if the level probe is installed and set up)

Display (e.g.):

```
Tank   20%
510mm     6800L
```

The display only stays as long as the "▼" button is pressed!

5.2.1.3 Software version display

It is possible to switch to the software version display from the input screens for the driver or vehicle identification by pressing the '►' button.

Display (e.g.):

```
Version: 4.020
```

The display only stays as long as the "►" button is pressed!

5.2.2 Dispensing without entering a code (optional)

If Code query: 'none' has been selected in the dispensing options in section 5.3.4.1.1, dispensing is possible without entering a code by pressing the '**ENTER**' key. Nevertheless, if a vehicle code is available it can be entered; the dispensed fuel will then be assigned to it.

Display (e.g.):

```
Code:***
10:29  14.03.11
```

The code query serves only to switch to the **management operating mode** with the master code (see section 5.3).
Notice: If "*ID query: none*" has been selected and the *Order* and *Mileage* queries have been deactivated too, dispensing begins **as soon as the nozzle is drawn** or the "**ENTER**" key is pressed!

5.2.3 Entering the mileage (optional)

A 1 to 8-digit mileage can be entered directly. A mileage check can be carried out if necessary (see dispensing options).

Display (e.g.):

```
Mileage:120000
10:29  14.03.11
```

For a downstream refuelling data evaluation the mileage must to be assigned to a vehicle, i.e. the vehicle must be queried!

5.2.4 Entering the order number (optional)

An alphanumerical value with a max of 8 digits can be entered.

Display (e.g.):

```
Order:FL-H88
10:29  14.03.11
```

5.2.5 Refuelling

After all queried parameters have been entered, refuelling is requested.

Display (e.g.):

```
Please refuel!
Quantity: 0.00 L
```

5.2.5.1 Entry of a preselected quantity (optional)

It is possible to enter a preselected quantity before drawing the nozzle. To this end the desired quantity in litres is entered directly using the numeric keys. After having pressed the first key, the display changes and indicates the preselected quantity.

Display (e.g.):

```
Pre-selection: 120    L
Quantity:      0.00 L
```

The preselection quantity is confirmed with '**ENTER**'; the entry of the preselection quantity is cancelled with '**EXIT**'. If the nozzle is drawn during the entry, a normal refuelling procedure is initiated without preselection of the quantity.

5.2.6 Refuelling procedure

After drawing the nozzle, the pump is switched on and the dispensed quantity is shown on the display.

Display (e.g.):

```
789.8 L
```

The dispensed quantity is updated continuously during dispensing.
Dispensing can be stopped using the "**EXIT**" button, even before the nozzle has been drawn. The time and quantity limits specified in the Dispensing options menu (5.3.4.1) apply to the refuelling procedure, even before the nozzle is drawn

Completion of dispensing by replacing the nozzle, pressing the 'EXIT' button or reaching the preselected quantity / dispensing limit is shown by a corresponding message for approx. 5 seconds.

Display (e.g.):

```
Dispensing finished
Quantity:    789.5 L
```

If dispensing is aborted due to a timeout, the cause of the abortion is shown in plain text on the display.

Display (e.g.):

```
Time Out
Quantity:
```

The dispensed quantity is displayed for 15 minutes or until a new refuelling operation is initiated.
After completion of the refuelling procedure, the dispensing event is saved in the memory of the automatic dispenser with all entered data (driver, vehicle etc.) plus a time stamp and can be processed running the corresponding management functions (see section 5.3.1).
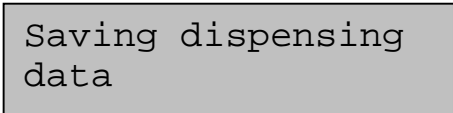
5.2.7 Data retrieval

The data is retrieved either via the USB port on the automatic dispenser onto a commercially available USB memory stick or optionally by means of a data cable to a PC (corresponding accessory is required – RS232/RS422 interface). Data retrieval is possible only in the 'Refuelling' mode from the input screens for the identification of the driver or vehicle.

5.2.7.1 Data retrieval via USB memory stick

The dispensing and system data of the HDA eco are written to a commercially available USB memory stick. The data on the USB memory stick can be processed on a PC using the HD Manager refuelling data administration program. To retrieve the data, the USB memory stick is inserted into the opening provided on the left of the automatic dispenser housing. Before doing so, the cover (if any) must be swivelled away after loosening the knurled screw.

Optionally, in order to protect against access by unauthorised persons, the master code must be entered after inserting the USB memory stick or the *master transponder* must be used (see section 5.3.3.2).

Display (e.g.):

```
Saving dispensing
data
```

To prevent the loss of data, the USB memory stick must not be removed during reading or writing. After completion of the data retrieval, the retrieved refuelling data are marked as transmitted and are therefore ignored in the case of subsequent data retrievals. See 0 for further details regarding the retrieved data and storage on the USB memory stick.

After completion of the data retrieval, the cover must be replaced and the knurled screw tightened.

5.2.7.2 Data retrieval via data cable

The connection of the appropriate accessory kit to a PC is necessary for data retrieval via a data cable. The data are retrieved and processed via the HD Manager refuelling data administration program – refer also to the separate manual.
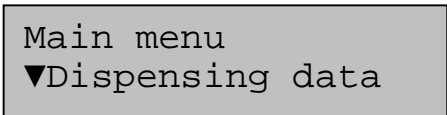
5.3 Management operating mode / main menu

The operating mode is switched to management by entering a master *code or by the use of the master transponder (plus entry of the PIN, as required).*

Master code factory setting: 99999, no PIN. It is absolutely essential to change this code (see section 5.3.3.2)

In this mode of operation system parameters can be set and various management functions can be performed, such as administration of the dispensing data, totals, IDs etc.

Display (e.g.):

```
Main menu
▼Dispensing data
```

Menu items are selected with the "▲" and "▼" keys and selection is confirmed by pressing the "**ENTER**" key. Sub-menus or menu items can be exited by pressing the "**EXIT**" key.

Pressing the "**EXIT**" key in the main menu will return you to the **Dispensing** mode.

5.3.1 Dispensing data menu

The functions for the display and processing of the dispensing data are combined in this menu. The HDA eco automatic dispenser can store up to 2000 dispensing data records. The oldest data records are overwritten once the memory is full.

Display (e.g.):
```
Dispensing data menu
▼Display dispensing events
```

After selecting the appropriate menu item, the respective sub-menus can be used to display or delete the dispensing data, to display the number of stored dispensing events or to create a report on a USB memory stick.
Select with '**ENTER**', abort with '**EXIT**'.

5.3.1.1 Display dispensing events

Display (e.g.):
```
Dispensing: 53 ♦
28/10/11 14:44 T
```

All of the dispensing events stored in the memory can be viewed, beginning with the last dispensing event. The dispensing event to be displayed can be selected using the "▲" and "▼"buttons. The"◄" and "►" buttons can be used to select the individual dispensing data (date, quantity, driver, vehicle, mileage, order no). Cancelling using '**EXIT**'.
The status of the dispensing event is shown by means of letters / special characters after the time. Meanings:

,**T**': Dispensing interrupted due to timeout
,**X**': Dispensing data record was transmitted / saved to the USB memory stick

When pressing the "**ENTER**" button an input mask appears, where the **displayed dispensing data set and all newer ones** can be marked as not transmitted. So these data can be retrieved from the PC or printed out again following e.g. loss of data or transmission errors.

Display (e.g.):
```
Dispensing data
restore?
```
Confirm with '**ENTER**', abort with '**EXIT**'.

5.3.1.2 Deleting dispensing events

Display (e.g.):
```
Dispensing data
Delete? ->ENT
```

Confirm with '**ENTER**', abort with '**EXIT**'. The data from the stored dispensing events will be marked as already transmitted.

Notice: The dispensing data are **NOT** physically deleted from the memory, but merely marked as already transmitted. That means that they will be ignored in the event of a new transmission or USB report. It is possible to undo the deletion (see section 5.3.1.1).

5.3.1.3   No. of dispensing events

Display (e.g.):

```
Dispensing: 1532
 76% used
```

The number of dispensing events saved and the memory used (in percent) are displayed. The maximum possible number of dispensing data records that can be saved is approx. 2000.

5.3.1.4   USB report – dispensing events

A report for the dispensing data not marked as already transmitted is saved as a text file ('DSPDATA.TXT') on a USB memory stick. The file can be opened with a text editor on a PC and printed, for example. The prerequisite for this is that a recordable USB memory stick is inserted in the USB port provided for it on the automatic dispenser.

Display (e.g.):

```
Saving report
        122 / 122
```

File (e.g.):

```
HDM eco

USB report - Dispensing data
..............................

Date 19/04/11      Time 17:42

Dispensing data:   1
..............................
Date 19/04/11      Time 09:24
Driver:            12
Vehicle:           15
Order:             17635
Mileage:           115050
Dispensing:        123.00  L

Dispensing data:   2
..............................
Date 20/04/11      Time 14:38
Driver:            23
Vehicle:           12
Order:             14711
Mileage:           20134
Dispensing:        234.00  L


..............................
```

The dispensing data are not marked as transmitted after the creation of the report. They will be saved again with a later report. If necessary, it is advisable to manually delete the dispensing data (see section 5.3.1.2).

5.3.2 Totals menu

This menu comprises the functions for the display and processing of the dispensing totals, i.e. the accumulated dispensing quantities.
The totals (driver / vehicle) to be processed must be selected beforehand.

Display (e.g.):

```
Totals menu
▼Driver totals
```

Subsequently, the items for the processing of the totals can be selected in the sub-menu.

Display (e.g.):

```
Totals menu
▼Display totals
```

After selecting the appropriate menu item, the respective sub-menus can be used to display or delete the totals data or to create a report on a USB memory stick. Select with '**ENTER**', abort with '**EXIT**'.

5.3.2.1 Display totals

Display (e.g.):

```
Vehicle: all  ♦
Total1: 110556 L
```

Display (e.g.):

```
Vehicle:  13  ♦
Total:     190 L
```

The total dispensed quantities Total 1 (not resettable) and Total 2 (resettable), the individual totals per vehicle and the total number of dispensing events without code entry can be displayed.
The total to be displayed can be selected using the "▲" and "▼"buttons.

Cancelling using ,**EXIT**'.

5.3.2.2 Delete totals

Display (e.g.):

```
Vehicle totals
Delete? ->ENT
```

Confirm with '**ENTER**', abort with '**EXIT**'. The total dispensed quantity Total 2, the individual totals vehicle and the total number of dispensing events without code entry are deleted. The total dispensed quantity Total 1 is not deleted.

5.3.2.3 USB report – totals

A report of the counter readings is saved as text file on a USB memory stick (*'DTOTDATA.TXT' for drivers, 'VTOTDATA.TXT' for vehicles*). The file can be opened on a PC using a text editor and printed. Therefore a recordable USB memory stick has to be inserted to the USB port of the automatic dispenser.

Display (e.g.):

```
Saving report
        100 / 100
```

File (e.g.):

```
HDM eco

USB report - total data
.............................


Date 20/04/11        Time 08:20

Vehicle totals

Total 1:                   5412 L
Total 2:                   2312 L

Vehicle    1:              1040 L
Vehicle    2:              2153 L
Vehicle  100:                99 L
Vehicle  ---:                20 L


.............................
```

5.3.3 IDs menu

In this menu the IDs can be edited and ID reports can be created.
The medium for the identification of the driver or vehicle before the start of refuelling is called an ID. Various system parameters can be specified for each ID. The master ID is a special ID. It is required in order to access the management mode.

The ID (driver / vehicle / master) to be processed must be selected first.
Display (e.g.):

```
IDs menu
▼Driver
```

The respective ID can subsequently be accessed via the sub-menu.

Display (e.g.):

```
♦ Vehicle      3
◆►Code:  12345
```

The ID to be edited can be selected using the "▲" and "▼" keys; "-" means that the respective ID has not been set up. In case a transponder has been set as access authorisation for an ID , the entry "TRANS" appears instead of the code.

After selecting an ID switching between its different parameters takes place using the "◄" or "►" buttons. Press the "**ENTER**" button to change the parameter and "**EXIT**" to complete the entry.

5.3.3.1 Code

A user code with one to five digits can be entered. An existing code can be deleted by confirming deletion.

Instead of the five-digit code, a transponder tag can be assigned to an ID. The transponder tag needs to be held at a distance of 2 – 5 cm to the reader. A beep tone indicates that the transponder tag has been read.

5.3.3.1.1 PIN

A 1 to 5-digit PIN can be entered in addition to the code or the transponder tag. In case a PIN was assigned it has to be entered after the code. Only some (or none) of the IDs can be assigned with a PIN.

Display (e.g.):

```
♦ Vehicle      1
◆►Pin:   12345
```

5.3.3.1.2 Dispensing limit

Here a dispensing limit per fuelling can be entered for the vehicle, maximum 9999 litres.

Display (e.g.):

```
♦ Vehicle      1
◆►Limit: 123 L
```

Comment: If the general dispensing limit for the dispenser is lower, then this applies.

5.3.3.1.3 Maximum dispensing time

Here a dispensing time limit per refuelling can be entered for the vehicle, maximum 99 litres.

Display (e.g.):

```
♦ Vehicle      1
◆►Time:    15 min
```

Comment: If the general dispensing time limit for the dispenser is lower, then this applies.

5.3.3.1.4 Mileage or operating hours query (only vehicles)

Depending on the vehicle type, prior to refuelling the mileage or operation hours of the vehicle can be entered to calculate the fuel consumption using an optional downstream fuel data processing system. Here it is specified whether the mileage (km) or operating hours (hrs) are input.

Display (e.g.):

```
♦ Vehicle      1
◆►Query:mileage (km)
```

5.3.3.1.5 Mileage or operating hours window

A mileage or operating hours window can be entered here defining the maximum permissible differences between two refuelling operations, max 9999 km or hrs.

Display (e.g.):

```
♦ Vehicle      1
◆Window:1000 km
```

5.3.3.1.6 Mileage or operating hours status

Here the actual mileage or operating hours of a vehicle can be viewed. If necessary the status can be edited.

Display (e.g.):

```
♦ Vehicle      1
◆km: 123456
```

Comment: It is not necessary to enter the mileage when creating a vehicle. This should be done prior to the first refuelling. A selected mileage window becomes effective only from second refuelling.

5.3.3.1.7 Block / release ID

An ID can be blocked or released here. Blocked IDs will not be accepted for refuelling. The Master ID cannot be blocked.

Display (e.g.):

```
♦ Vehicle      1
◆Blocked: No
```

5.3.3.2 Master ID

For secure access to the HDA management functions entering a master code with additional master pin is necessary. **The factory presets are: master code '99999', no PIN**

Display (e.g.):

```
   Master
◆Code: 99999
```

Display (e.g.):

```
   Master
◆Pin:
```

The "◄" and "►" keys can be used to switch between the code and the PIN entry. Press "**ENTER**" to change the respective parameter and "**EXIT**" to complete the entry.

Instead of a code, a transponder can be assigned to the master code. The transponder tag must be held within a distance of 2 – 5 cm to the reader.

Notice: In case the master code/PIN was forgotten (or a master transponder was lost) no more management functions are accessible. Contact Horn service!

5.3.3.3 USB report – IDs

A report for the driver IDs ('DIDDATA.TXT') and a report for the vehicle IDs ('VIDDA-TA.TXT') are saved as text files on a USB memory stick. The file can be opened on a PC using a text editor and printed. Therefore a recordable USB memory stick has to be inserted to the USB port of the automatic dispenser.

Display (e.g.):

```
Saving report
        3 / 100
```

File (e.g.):

```
HDM eco

USB report - IDs
.................................
Date: 19/03/11   Time: 14:01
.................................

Master
     Code:           99999
     Pin:            -
.................................

Vehicle   1

     Code:           123
     Pin:            123
.................................

Vehicle   2

     Code:           234
     Pin:            -
.................................

Vehicle   3

     Code:           0104FAC78C
     Pin:            8696
.................................
```

Comment: The ID file contains all codes and/or the associated PINs in plain text and should not be made accessible to unauthorised persons.

5.3.4 System menu

Various system parameters for the operation of the dispenser can be viewed and adjusted in this menu.

Display (e.g.):
```
System menu
▼Dispensing options
```

Menu items are selected with the "▲" and "▼"keys, confirmed with "**ENTER**" and cancelled with "EXIT".

5.3.4.1 Dispensing options menu

In this menu you can specify the items which are to be queried before a dispensing event. In addition, the inputs of a general dispensing limit, a maximum dispensing time and a timeout are also possible.

Display (e.g.):
```
Disp. option menu
▼Query ID
```

Menu items are selected with the "▲" and "▼"keys, confirmed with "**ENTER**" and cancelled with "EXIT".

5.3.4.1.1 ID query

Display (e.g.):
```
ID query
◆ Vehicle
```

The query of the driver and vehicle ID is optional.
You can choose between "No", "Driver", „Vehicle " and "both".

Notice: If ID query: 'none' has been selected and the order and mileage queries have also been deactivated, dispensing will begin as soon as the nozzle is drawn!

5.3.4.1.2 Mileage y/n

Display (e.g.):
```
Mileage
◆compulsory query
```

The input of the mileage before each dispensing operation is optional. You can choose between "query", "compulsory query" and "non query". If "compulsory query" is selected, the input and checking of the mileage is compulsory. The mileage entered must be as high as or higher than that which was entered last time, the difference between the mileages needs to be smaller than the defined mileage window for the vehicle. In case a consumption calculation according to operating hours takes place for the vehicle in question, the same applies in turn for the entry of the operating hours.

5.3.4.1.3 Previous mileage y/n

Display (e.g.):
```
Previous mileage
◆Yes
```

In order to simplify the mileage entry, mileage from the last refuelling event (if available) can be displayed and edited. You can choose between "yes" and "no". In case a consumption calculation according to operating hours takes place for the vehicle in question, the same applies in turn for the display of the operating hours.

5.3.4.1.4   Order y/n

Display (e.g.):

```
Order
◆query
```

The entry of an order no. before each dispensing is optional. You can choose between "query" and "no query".

5.3.4.1.5   Dispensing limit

Display (e.g.):

```
Dispensing limit
   9999 L
```

The maximum possible dispensing quantity per refuelling operation can be specified here (absolute limit). A quantity between 5 and 9999 litres can be entered. In case the vehicle specific limit is lower then it applies.

5.3.4.1.6   Max. dispensing time

Display (e.g.):

```
Max. dispensing time:
   15 min
```

The maximum possible dispensing time per refuelling operation can be specified here. A value between 1 and 99 minutes can be entered. In case the vehicle specific limit is lower then it applies.

5.3.4.1.7   Dispensing timeout

Display (e.g.):

```
Dispensing timeout
   5 min
```

The maximum elapsing time during a dispensing event without any medium being dispensed can be specified here. (Example: The nozzle wasn't replaced after dispensing was completed). A time between 1 and 9 minutes can be entered.

5.3.4.2   Dispensing point menu

Display (e.g.):

```
Dispensing point menu
▼Impulses / litre
```

After selection of the menu items, the corresponding dispensing point parameters can be adjusted in the respective sub-menus.

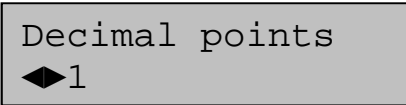### 5.3.4.2.1   Impulses / litre

Display (e.g.):

```
Impulses / litre
   53.95 / 100
```

The pulse value of the pulse generator employed is set in this menu. A value of between 1 and 1000 can be entered. The standard pulse value is 53.95, the setting for the FMOG 100 counter.
It may be necessary, to modify this value after calibrating the measurement system.
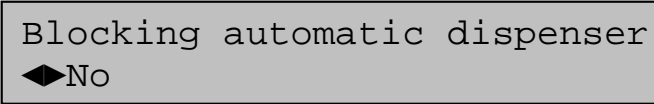
5.3.4.2.2   Decimal points

Display (e.g.):

```
Decimal points
◆▶1
```

The number of decimal points displayed during dispensing can be displayed and changed here.
You can choose between '0' and '1'.

5.3.4.2.3   Automatic dispenser blocking
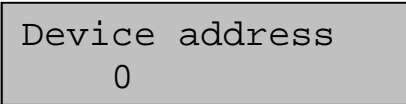
Display (e.g.):

```
Blocking automatic dispenser
◆▶No
```

Here you can set whether the automatic dispenser should be blocked for refuelling or enabled again after having been blocked.
You can choose between "yes" and "no".

5.3.4.2.4   Device address

Display (e.g.):

```
Device address
      0
```
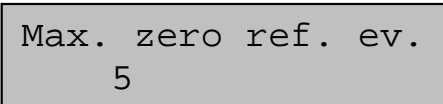
The device address is necessary for the joint operation of several HDM eco units with one HD Manager program (not possible with HD Manager eco).
A value of between 0 and 9 can be entered.

5.3.4.2.5   Max zero refuelling events

Several sequential refuelling events that were completed with a dispensing quantity below 500 ml ("zero refuelling") indicate a system error, e.g. lack of fuel, defective pump or meter.

Display (e.g.):

```
Max. zero ref. ev.
      5
```

When a value > 0 has been set for "max. zero refuelling events" the automatic dispenser blocks automatically after the specified number of consecutive zero refuelling events. A blocked automatic dispenser can be enabled again via the corresponding menu in the device once the cause for zero refuellings has been eliminated (see section 5.3.4.2.3).
A value of 0 deactivates the blocking function. Values from 0 – 99 can be entered.

5.3.4.3   Expanded menu :

Expanded system settings or queries can be made here.

Display (e.g.):

```
Expanded menu
▼Real-time clock
```

Menu items are selected with the "▲" and "▼"keys, confirmed with "**ENTER**" and cancelled with "**EXIT**".

5.3.4.3.1   Real-time clock menu:

Display (e.g.):

```
Real-time clock menu
▼Date / Time
```

The settings for the real-time clock (RTC) can be made here. Menu items are selected with the "▲" and "▼"keys, confirmed with "**ENTER**" and cancelled with "**EXIT**".

5.3.4.3.1.1   Date / Time

Display (e.g.):

```
Date: 20.04.11
Time:  16.21.04
```

The date and time settings of the integrated real-time clock can be inspected and changed if necessary. You can change the position using the "◄" and "►" buttons.

5.3.4.3.1.2   Clock correction

Display (e.g.):

```
Clock correction
◄► + 5 sec. / day
```

In order to achieve the greatest possible accuracy of the integrated real-time clock a correction of up to ± 20 seconds per day can be done. The correction is carried out each time at midnight or when the device is switched on. With the device switched off only the clock runs, no correction is carried out.
The correction ranges can be set from -20 to + 20 sec. / day using the"◄"0 and "►" buttons.

5.3.4.3.1.3   Summer time/switching between summer and winter time

Display (e.g.):

```
 Time: 15.45.02
◄► 1 hr forward
```

Using the '◄' and '►' buttons, the system time can be manually set 1 hour forward or back depending on the season. The system time is then changed by pressing the '**ENTER**' key.

5.3.4.3.2   LCD contrast

Display (e.g.):

```
LCD contrast
◄► 44
```

The contrast can be decreased or increased using the '◄' and '►' buttons.

The setting range extends from 0 (low contrast) to 63 (high contrast). Changing the default value should only be necessary under extreme operating conditions (very low/very high temperatures).

In case the incorrect contrast has been saved inadvertently (display unreadable): Switch off the device and switch on again keeping the "**EXIT**" button pressed (standard contrast will be selected). Subsequently adjust the contrast as described.
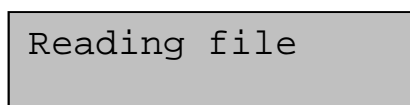
5.3.4.3.3 Language

Display (e.g.):

```
Language
◆▶ German
```

Various languages for the user menus are to be selected using the „◀" and „▶" buttons. One of the languages ('language x') can be loaded and selected as defined by the user (see section 5.3.4.3.4).

5.3.4.3.4 Loading a language from a USB memory stick
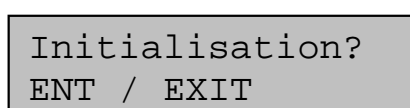
Display (e.g.):

```
Reading file
```

It is possible to load an additional language for the user guidance from a USB memory stick. The prerequisite for this is that a USB memory stick containing a suitable language file 'LANGUAGE.CSV' is inserted in the USB port provided for it on the automatic dispenser. Refer to 0 for further information.

5.3.4.3.5 Initialisation / restoring the factory settings

Display (e.g.):

```
Initialisation?
ENT / EXIT
```

The device can be initialised here. Some of the factory settings are restored. Dispensing data records and non-resettable totals (Total 1) are not deleted. The following values are manipulated:

- The driver and vehicle totals as well as the resettable counter Total 2 are cleared
- The non-resettable counter Total 1 is not cleared
- The dispensing data records are marked as transmitted
- All ID codes are deleted and the parameters re-initialised
- The Master code is set to "99999" without Master Pin
- The dispensing limit is set to 9999 litres
- The maximum dispensing time is set to 30 minutes.
- The timeout is set to 2 minutes
- The contrast is set to 44
- The communication code is deleted.
- The automatic dispenser is released

5.3.4.3.6   Configuration info

This display is intended for service purposes. It provides information about the configuration of the automatic dispenser.

Display (e.g.):
```
Config. info
     00110010
```

5.3.4.3.7   Release

This display is intended for service purposes. It can be used to change the configuration of the automatic dispenser

Display (e.g.):
```
Release
Code:
```

NOTE! Incorrect entries made by unauthorised personnel can result in incorrect functioning of the automatic dispenser!

5.3.4.3.8   Communications PIN

Display (e.g.):
```
Comm-PIN
     12345
```

Here an optional communication PIN for the transmission of data to the HD Manager PC program can be viewed (but not changed). The communication PIN can only be set or deleted using the HD Manager program.

5.3.4.3.9   USB code

Display (e.g.):
```
USB code
◆No
```

Here it can be specified whether the retrieval of the refuelling data via USB memory stick in dispensing mode is to be protected against unauthorised access by the input of master code or by the use of the master transponder.
You can choose between "yes" and "no".

5.3.4.4   Transponder ID

Display (e.g.):
```
Vehicle 002
01 04 FA C7 8C
```

Transponder tags and the associated ID, if any, can be identified. The transponder tag needs to be held at a distance of 2 – 5 cm to the reader. Cancelling using ‚**EXIT'**.

5.3.5 Fuel tank menu

The function of the tank monitoring as well as tank parameters (level probe option only) can be set in this menu.

Display (e.g.):

```
Tank menu
▼Tank monitoring
```

5.3.5.1 Tank monitoring

Monitoring of the tank contents including blocking of the dispensing point in case of empty tank can be switched on or off. This applies both to monitoring by means of a low medium contact (e.g. float switch) and to the monitoring and display of the tank contents by means of a level probe (optional).

Display (e.g.):

```
Tank monitoring
◆ no
```

You can choose between "yes" and "no".

Note: In the case of use of the low medium contact, the automatic dispenser is disabled when the contact switches from the closed to the open state. The level at which disablement takes place when a level probe (optional) is used depends on the setting of the disable volume (see section 5.3.5.2.8).

5.3.5.2 Tank parameter menu (level probe option only)

In the case of use of a level probe, it is necessary to parameterise the probe and the associated tank as accurately as possible in order to obtain exact level values.
You can switch between the different tank parameters using the '◄' or '►' buttons.
Press the "**ENTER**" button to change the parameter and "**EXIT**" to complete the entry.

Instructions for the installation of the level probe in the tank can be found in section 3.5.2.

5.3.5.2.1 Form / tank shape

The shape of the employed tank can be set here. If there is no tank, then accordingly no tank is set (shape '---').

Display (e.g.):

```
Tank parameters
◆Shape Cyl L
```

Change the tank shape using the buttons „◄" and „►" . There is a choice of the tank shapes cube, upright cylinder ('Cyl U'), lying cylinder ('Cyl L'), ball or no tank (---).

5.3.5.2.2 Max. volume / maximum tank volume

The maximum tank volume can be entered here. It corresponds to a completely filled tank.

Display (e.g.):

```
Tank parameters
◆MaxVol 10000 L
```

A value of between 0 and 999999 litres can be entered.

5.3.5.2.3 Level / maximum level

Display (e.g.):

```
Tank parameters
◆Height  1600
```

The maximum level in mm is entered as value between 0 and 9999.

5.3.5.2.4 Density of medium

Display (e.g.):

```
Tank parameters
◆Density 860 g/L
```

In order for the hydrostatic tank probe to work precisely, the density of the tank medium [g/l] must be entered. A value of between 0 and 9999 can be entered.

5.3.5.2.5 Sensor type

Display (e.g.):

```
Tank parameters
◆Sensor 200mBar
```

Input of the sensor type (sensor range). There is a choice of the types 200 mbar, 300 mbar, 500 mbar and 1000 mbar. The selection of the type of sensor is made according to the height of the tank. Hence, 200 mbar correspond to 200 cm water gauge or 230 cm diesel gauge, 300 mbar to 300 cm water gauge or 340 cm diesel gauge and so on.

5.3.5.2.6 Sensor offset (installation height)

Display (e.g.):

```
Tank parameters
◆Offset 11  mm
```

Offset entry [mm] (corresponds to the effective installation height of the sensor relative to the floor of the tank). Using the "►" button, "-" can be entered for a negative offset (e.g. when the sensor is installed below the tank floor or inclined tank).

5.3.5.2.7 Zero point compensation of the sensor

The sensor must be outside the liquid for the zero point compensation.

Display (e.g.):

```
Tank parameters
◆Zero compensation
```

The presently measured probe current is displayed after pressing the 'ENTER' button. It should lie within the range 4 mA +/- 0.2 mA

Display (e.g.):

```
Zero compensation
Current:  4.05 mA
```

Pressing the 'ENTER' button twice executes the zero point compensation for the probe, while the 'EXIT' button aborts the compensation.

5.3.5.2.8 Min. volume / disable volume

An limit value can be entered here, below which the dispensing point will be disabled. The value is checked before each refuelling, i.e. active refuellings will be ended in

every case! The disablement is automatically cancelled after refilling the tank or switching the tank monitoring off (see section 5.3.5.1).

Display (e.g.):

```
Tank parameters
◆MinVol 5000 L
```

5.3.5.3   Tank contents (level probe option only)

The filling quantity in percent, the measured filling level and the filling quantity in litres are displayed.

Display (e.g.):

```
Tank  20%
 510mm     6800L
```

6   Commissioning

6.1   First and subsequent priming

The pump is a self-priming vane-cell pump. For commissioning, therefore, all that is required is to carry out a 'normal refuelling' as described in section 5.2, in which medium is sucked out of the tank. In order to prevent damage to the pump and seals, it must be ensured that the pump does not run dry for an unnecessarily long period. A normal priming procedure should not take longer than 2 minutes. If the medium has not been primed within this time, the suction line must be inspected for leaks and the function of the anti-syphon valve must be checked.

Unnecessarily long dry running (> 1 min) has to be avoided since otherwise important components may be destroyed.

Approx. 30 litres should be discharged into a collecting vessel to ensure that any air bubbles in the suction line are thoroughly flushed out. Dispose of this medium as flushing fluid.

7   Operation

The following must be observed for normal operation:

❗ **Avoid dry running (>1min).**

❗ **A defective hose can cause contamination.**

❗ **If the nozzle is closed and the pump is filled with medium, the pump may be operated for a maximum of 2 minutes, otherwise excessive heating up may occur, resulting in the destruction of important components.**

❗ **Following the filling procedure, the nozzle must be hung up in the nozzle holder and the hose protected against being driven over by hanging it on the hose holder.**

❗ **Only vehicle tanks and suitable containers may be filled. The dispensing procedure must be supervised.**

To draw off fuel in normal operation, proceed as follows:
1. Identify yourself at the dispenser in order to enable it.

☛ **The procedure to enable the dispenser is described in detail in section 5.2.**

2. Switch on the pump by drawing the nozzle.

3. Put the nozzle into the container or the vehicle tank.

4. Open the nozzle until the desired quantity has been dispensed.

5. Replace the nozzle to the nozzle holder. The electric pump switches off automatically.

Please follow the nozzle operation manual or section 9 as well.

8   Emergency operation

HDM eco pumps with serial number above 1810300 are equipped with an emergency operation mode which enables emergency operation of the pump, if the HDA automatic dispencer unit is not functional.
To do this, proceed as follows:
-   Open the housing as described above
-   Activate the emergency operation mode on the underside of the HDA eco. The filling pump starts up automatically.
-   Implement the tanking process.
-   Immediately after completing the tanking process, the filling pump must be deactivated by switching off at the emergency operation switch
-   To protect from unauthorised use, the housing must be closed after each tanking process.

9   A2010 nozzle

9.1   Description

The HDM eco dispenser is equipped with an automatic nozzle of the type A2010. It is an automatically closing full-hose nozzle for dispensing the liquids specified above. The A2010 automatic nozzle has been tested in accordance with the DIN EN 13012 standard.

The standard features of the nozzles include: a safety switch-off and a covering that protects against wear and cold conditions.

Moreover, the type A2010 nozzles feature a 3-stage holding clip for the control lever and a spring around the outlet pipe to lock the latter in the tank filler pipe.

Other nozzles can also be used as special equipment. The corresponding operating manuals are to be followed for these.

9.2   Intended use

The automatic nozzles are manufactured state of the art and failsafe.

⚠ **However these products may pose great risk when not used according to specifications.**

Persons concerned with assembly, commissioning, maintenance and operation of the automatic nozzle must have read and understood the entire manual.

❗ **The A2010 automatic nozzles are certified exclusively for dispensing diesel fuel in accordance with DIN 590 or DIN 51628, biodiesel (RME) in accordance with DIN EN 14214 and fuel oil EL in accordance with DIN 51603-1.**

❗ **Using the machine for any other purpose would constitute inappropriate use. The manufacturer accepts no liability for resulting damages; the risk shall be borne by the operating company alone in such cases.**

Intended use also means complying with the assembly, commissioning, operating and maintenance conditions specified by the manufacturer.

The local safety and accident prevention regulations apply to the operation of the automatic nozzles.

Use extends to:
- Dispensing installations at petrol stations (in Germany: TRbF 40, No.4.1.1.6 and TRwS 781-2)
- Filling of mobile containers and fuel tanks of working machinery outdoors (in Germany: TRbF 30, annex 4)
- Filling single tanks with a capacity of up to 1000 litres for the storage of diesel fuel and heating oil (in Germany: TRbF 20, no. 9.3.2.3, section 3)

9.3   Function / safety equipment

The closing valve of the A2010 automatic nozzle can only be opened manually using the control lever. An automatic shutdown occurs as a result of negative pressure or shaking when
- the tank is full, i.e. fuel fills the sensor jet on the outlet pipe.
- the nozzle is held vertically (see fig. B).
- the nozzle with locked control lever falls down.

Switching-off can also be performed manually by releasing the holding clip (if present) on the control lever.

9.4 Operating instructions

The A2010 automatic nozzles are ready for use. No adjustment or lubrication needs to be carried out.

⚠ **Smoking is generally prohibited, also when drawing off diesel and heating oil EL. Sources of ignition, such as fire, flying sparks etc., must be eliminated.**

Insert the outlet pipe into the tank filler pipe to the extent that it will remain securely in the tank filler pipe (see fig. A). This also ensures that the nozzle shuts down when the fuel tank is full.

For product variants with a holding clip guide the latter towards the protective bracket and latch the control lever.

Fig A   **Fig B**
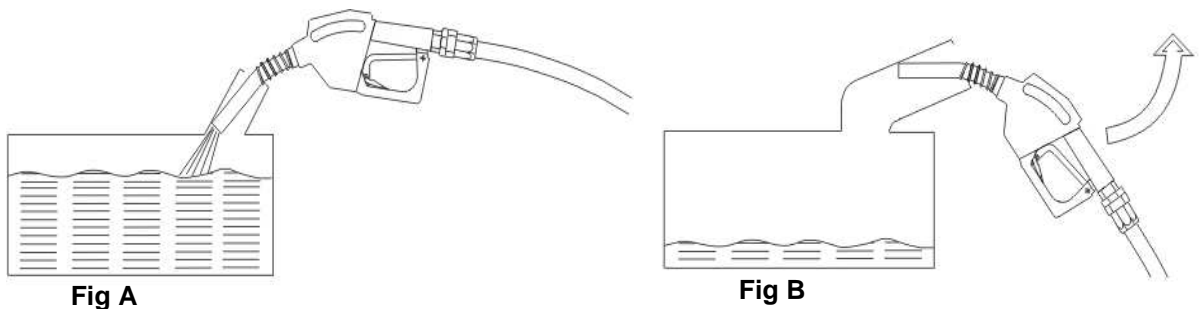
Once the nozzle has automatically shut down, tilt the nozzle towards the tank for a few seconds until the last drops have dripped out of the outlet pipe. This is also to be recommended when the filling procedure is ended manually.

If the nozzle can only be locked as shown in fig. B, it is not possible to fill the fuel tank. The nozzle shuts down immediately. Guide the nozzle in the direction of the arrow (see fig. B) to a position as shown in fig. A. The nozzle must be held in this position throughout the filling procedure. Items 2 and 3 apply accordingly.

❗ If small amounts are re-filled manually and when filling with the control lever locked, the volume flow may be less than the minimum allowed. In this case, the automatic shutdown of the nozzle can no longer work reliably! The fuel tank may be overfilled.

❗ The filling process must be supervised even when using an automatically-closing nozzle!

Outlet pipe

Sensor jet,
Sensor pipe

Spring*   Holding clip   Control lever

Swivel joint

Protective bracket
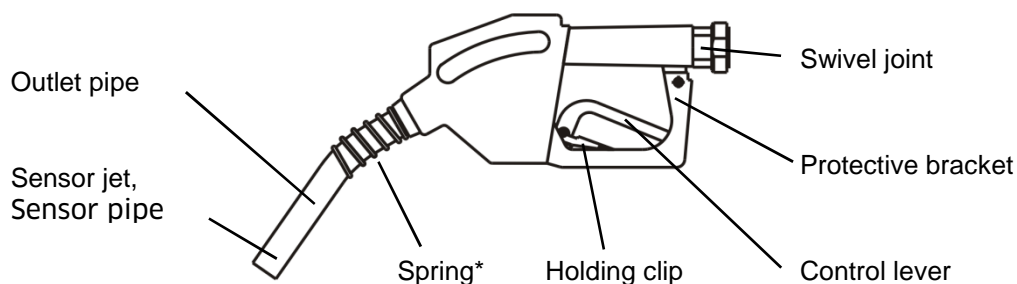
10 Spare parts

Housing, see drawing ET-1665001

10	Housing including door	816650019
20	Door, complete	816650021
30	Plastic cover including screws	816658001
40	Lock including 2 keys	417101200
50	Dispensing hose holder	516650009
60	Rubber buffer for door unit	490602650
70	Nozzle bag with nozzle switch (including screws)	816658006

Hydraulic system, see drawing ET-1665002

10	Pump, HDM 60 eco, with attachments	816658002
20	Pump, HDM 80 eco, with attachments	816658003
30	Rubber buffer set, pump support	816658004
40	Connection hose, HDM 80 eco	421301550
50	Connection hose, HDM 60 eco	421301570
60	Oval wheel meter, FMOG-100	916670001
70	Compensation tube with adaptor	816650004
80	Flange for wall opening	516670006
90	Seal & screw set for counter installation	816658005
100	Dispensing hose, DN25 4m - HDM 80 eco	421301100
110	Dispensing hose, DN19 4m - HDM 60 eco	421202250
120	Swivel joint for wall opening G1" IA	406537170
130	A2010 nozzle	405301800
140	Swivel joint for nozzle G1" I - G3/4" A	406537160
150	Elbow 90° G1"	406000950
160	Sealing ring Ø33x44x2	404006700

Electronic system, see drawing ET-1670001

10	PCB, HDA eco automatic dispenser	816708001
20	USB cover set	816708002
30	HDA eco cover including keyboard membrane & RFID antenna	816708003
40	Buffer battery (exchange every 5 years)	450600900
50	Fuse, HDA eco	450506200

Signs

Type plate, HDM 60 eco	420003768*
Type plate, HDM 80 eco	420003769*
Warning sign – diesel fuel, German	420001973
Warning sign – 'No smoking'	420000491

* Please indicate the serial number, year of manufacture
and features of the dispenser when ordering type plates

Z (1 : 2)

50

60 Wird 4x benötigt
    4x needed
    Nécessaire 4x

40 Inkl. 2x Schlüssel
    incl. 2 keys
    Avec 2 clés

70

20

30

10

Z
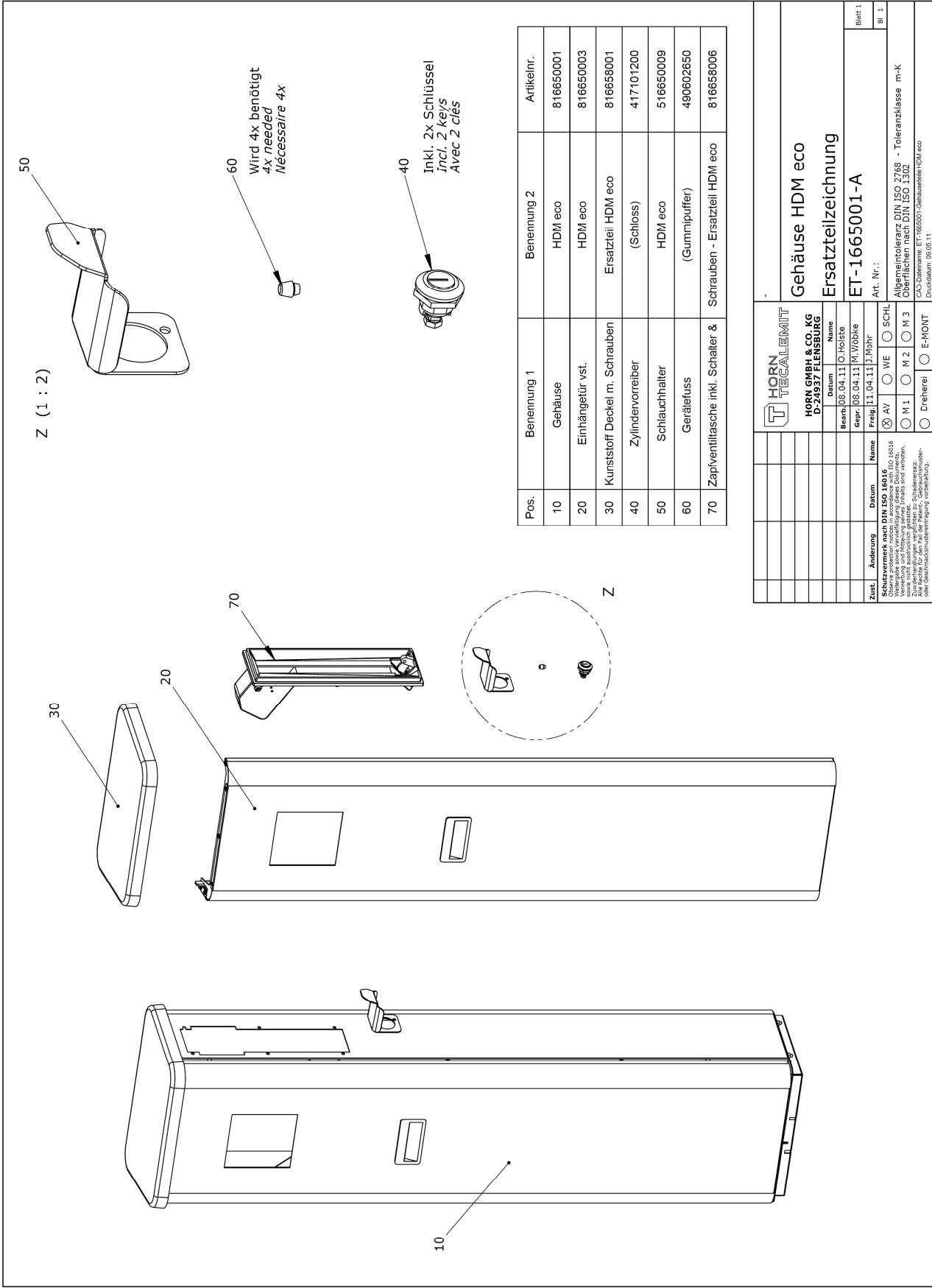
Pos.	Benennung 1	Benennung 2	Artikelnr.
10	Gehäuse	HDM eco	816650001
20	Einhängetür vst.	HDM eco	816650003
30	Kunststoff Deckel m. Schrauben	Ersatzteil HDM eco	816658001
40	Zylindervorreiber	(Schloss)	417101200
50	Schlauchhalter	HDM eco	516650009
60	Gerätefuss	(Gummipuffer)	490602650
70	Zapfventiltasche inkl. Schalter &	Schrauben - Ersatzteil HDM eco	816658006

Gehäuse HDM eco

Ersatzteilzeichnung

ET-1665001-A

Art. Nr.:

HORN GMBH & CO. KG
D-24937 FLENSBURG

HORN TECALEMIT

	Datum	Name
Bearb.	08.04.11	O.Holste
Gepr.	08.04.11	M.Wöbke
Freig.	11.04.11	J.Mohr

⊗ AV   ○ WE   ○ SCHL
○ M 1   ○ M 2   ○ M 3
○ Dreherei   ○ E-MONT

Allgemeintoleranz DIN ISO 2768 - Toleranzklasse m-K
Oberflächen nach DIN ISO 1302

CAD-Dateiname: ET-1665001-Gehäuseteile HDM eco
Druckdatum: 09.05.11

Blatt: 1
Bl   1

Zust.	Änderung	Datum	Name

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Z (1 : 3)

Pos.	Benennung 1	Benennung 2	Artikelnr.
10	Pumpe mit Anbauteilen	HDM 60 eco Ersatzteil	816658002
20	Pumpe mit Anbauteilen	HDM 80 eco Ersatzteil	816658003
30	Set Gummipuffer	Ersatzteil HDM eco	816658004
40	Druckschlauch DN 25x375	HDM 80 eco	421301550
50	Druckschlauch DM 25x435	HDM 60 eco	421301570
60	FMOG-100		916670001
70	Ausgleichsrohr mit Adapter	HDM eco	816650004
80	Flansch G1"	FMOG-100	516670006
90	Dichtungs- & Schraubensatz	FMOG-100 -Einbau HDM eco	816658005
100	Druckschlauch DN25x4000	HDM 80 eco	421301100
110	Druckschlauch DN19x4000	HDM 60 eco	421202250
120	Drehverschraubung G1" IA		406537170
130	Zapfventil A2010		405301800
140	Drehverschraubung G1" x G3/4" IA		406537160
150	Winkelstück G1" I-A	Messing vernickelt	406000950
160	Dichtring ø32x44x2	Klingersil C-4400	404006700

HORN GMBH & CO. KG
D-24937 FLENSBURG

Hydraulik HDM eco
Ersatzteilzeichnung

ET-1665002-B

Art. Nr.:

Allgemeintoleranz DIN ISO 2768 - Toleranzklasse m-K
Oberflächen nach DIN ISO 1302

CAD-Dateiname ET-1665002-Hydraulik HDM eco
Druckdatum: 02.09.11

		Datum	Name
Bearb.	12.04.11	O.Holste	
Gepr.	13.04.11	M.Wobke	
Freig.	13.04.11	C.Carstensen	

☒ AV ○ WE ○ SCHL
○ M 1 ○ M 2 ○ M 3
○ Dreherei ○ E-MONT

B	02909	02.09.11	ho	
Zust.	Änderung	Datum	Name	

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oder Geschmacksmustereintragung vorbehalten.

Blatt 1
Bl   1

Platine inkl. Pufferbatterie und Programmierung
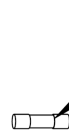*PCB incl. battery and programing*
Platine avec batterie et programmation

10
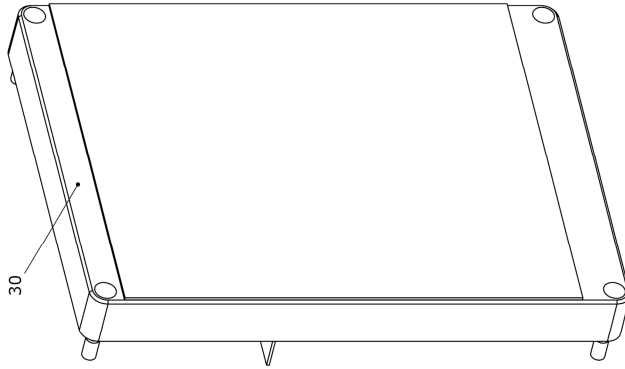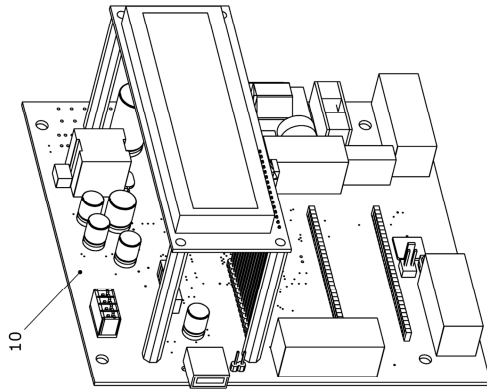
Abdeckung inkl. Tastaturfolie und RFID Antenne
Cover incl. keypad and RFID antenna
Couvercle avec clavier et antenne RFID

30

50

40

Pufferbatterie
Battery
Batterie
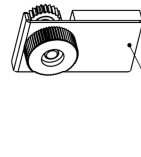
20

USB Abdeckung
USB Cover
Protection USB

HDA eco

Ersatzteilzeichnung / spare parts

ET-1670001-B

Pos.	Benennung 1	Benennung 2	Artikelnr.
10	Platine HDA eco	Ersatzteil	816708001
20	Set USB Abdeckung	Ersatzteil HDA eco	816708002
30	Abdeckung inkl Tastaturfolie &	RFID Antenne - Ersatzteil HDA eco	816708003
40	Batterie CR2032-3V		450600900
50	Gassicherungseinsatz	6,3A träge	

HORN
TECALEMIT

HORN GMBH & CO. KG
D-24937 FLENSBURG

Art. Nr.:

		Datum	Name
Bearb.	06.05.11	O.Holste	
Gepr.	09.05.11	M.Woike	
Freig.	09.05.11	C.Carstensen	

⊗ AV ○ WE ○ SCHL
○ M 1 ○ M 2 ○ M 3
○ Dreherei ○ E-MONT

Allgemeintoleranz DIN ISO 2768 - Toleranzklasse m-K
Oberflächen nach DIN ISO 1302

CAD-Dateiname: ET-1670001-HDA eco
Druckdatum: 18.05.11

Blatt 1
Bl 1

B	07731	18.05.11	ho	
Zust.	Änderung	Datum		Name

11   Fault display – What to do if … ?

… the pump runs, but the automatic nozzle immediately shuts off again?
- The sensor pipe of the automatic nozzle is clogged: The nozzle must be cleaned.

… the pump runs, but no medium is pumped?
- Storage tank is empty: hang up the nozzle immediately and refill the tank
- Air has entered the suction line: hang up the nozzle immediately and fill the suction line as described above.

…the pump does not start up after drawing the nozzle?
- The dispenser is disabled due to too many zero refuelling procedures: Enable the dispenser as described in sections 5.3.4.2.3 and 5.3.4.3.7 and check whether there is a technical defect.

… The pumps is operating, but too little media is pumped?
- The suction-side filter is dirty and must be cleaned.
- The optional pressure-side fine filter is dirty and the filter cartridge must be replaced.

12   Maintenance

⚠ For any maintenance the valid and applicable accident prevention regulations must be observed. Disconnect the device from the power supply and depressurise it when carrying out maintenance work. Secure it against being unintentionally switched on. Maintenance and repair work may only be carried out by specially-trained service technicians.

Although the HDM eco dispenser is to a large extent maintenance-free, the following work should be performed regularly in order to ensure reliable operation.

12.1 Regular inspections / maintenance work

Components	Inspections / maintenance work	Weekly	Monthly	As required / in case of malfunc-
Automatic nozzle	Check the automatic function		X	X
Nozzle holster	Clean with water and non-aggressive household cleaning agent			X
	Lubricate the switch flap with non-resinating spray oil		X	X
Discharge hose	Check the discharge hose for damage and increased wear		X	X
Hydraulic components	Check the system visually for tightness		X	X

The maintenance intervals are maximum periods that must be shortened in the case of difficult operating conditions (e.g. heavy use, careless users).

12.2 Cleaning the system

Clean dirty outsides carefully with a damp cloth and gentle household cleaner. Do not use aggressive (e.g. abrasive, chlorinated) cleaning agents or solvents. The equipment must not be cleaned with a high-pressure cleaner or water jet.

12.3 Maintenance of the nozzle

Make sure that the sensor jet on the outlet pipe is always open. The nozzle does not work if the sensor jet is dirty. Any dirt particles can be removed using a suitable wire. Greasing or oiling is not necessary.

12.4 Exchanging the buffer battery

The HDA eco automatic dispenser has a buffer battery for the backup of the time and the date in the event of a power failure. The battery must be exchanged every 5 years by an electrician.

12.5 Type Plate and Warning Signs

The warning signs attached to the device and the type plate must be well legible. Dirty signs must be cleaned, and replaced if necessary.

13 Disposal

The device is to be emptied completely and the liquids properly disposed of in case it is taken out of service.
The equipment is to be disposed of properly when taken permanently out of service:
- Return old metal for recycling.
- Return plastic parts for recycling.
- Return electronic waste for recycling.

The water legal regulations are to be followed.

13.1 Return of batteries

Batteries must not be disposed of with the domestic waste. Batteries can be returned free of charge via a suitable collecting point or to the dispatch stores. Consumers are legally obliged to return used batteries.
Batteries that contain harmful substances are marked with a crossed out dustbin (see above) and the chemical symbol (Cd, Hg or Pb) of the heavy metal that is decisive for the classification as containing harmful substances:
1. "Cd" stands for cadmium.
2. "Pb" stands for lead.
3. "Hg" stands for mercury.
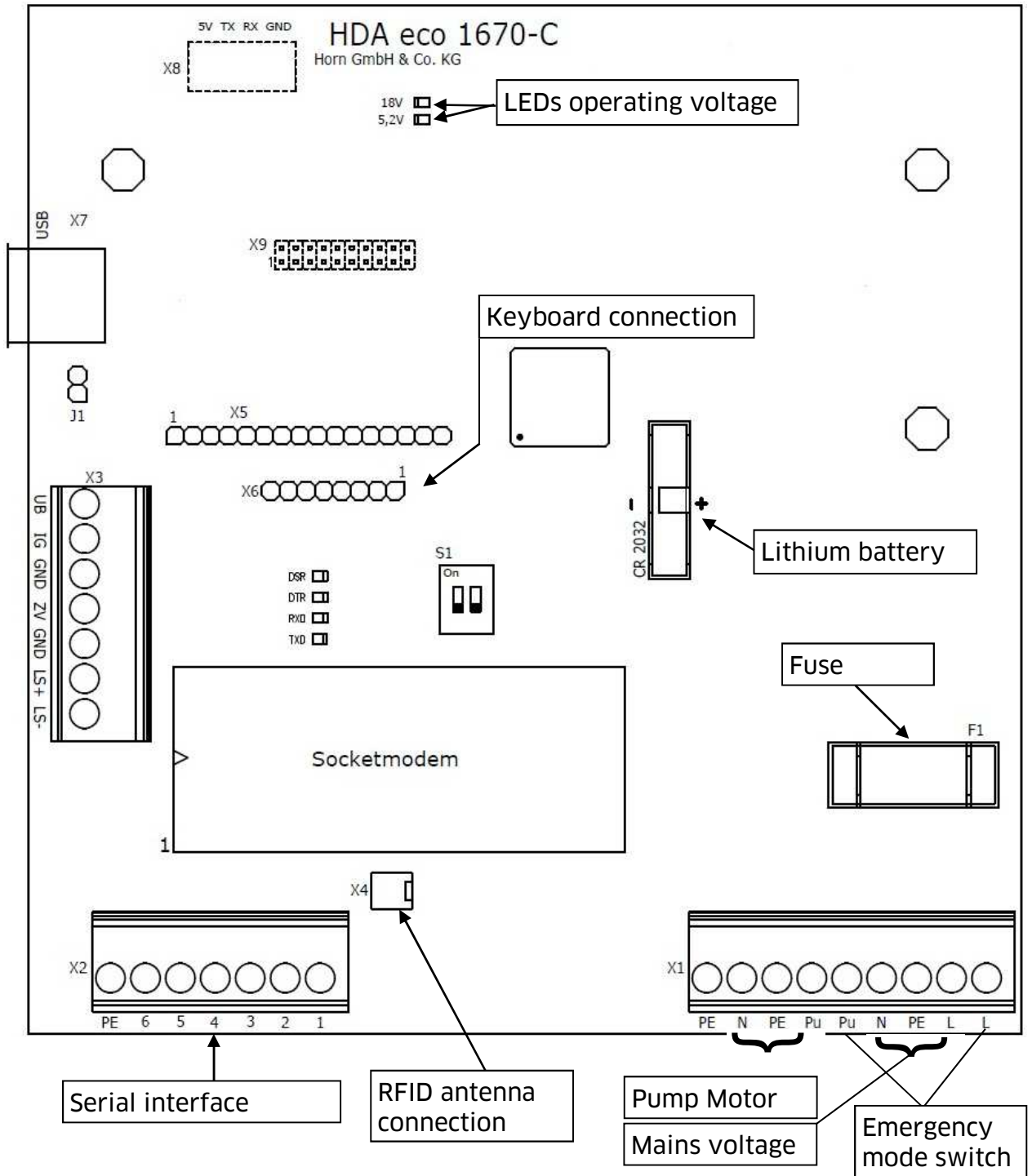
Terminal strip	Terminal	Signal	
	L	Mains voltage - live	
	PE	Mains voltage - protective earth	
X1	N	Mains voltage - neutral	
	Pu	Switched phase for motor	
	2nd L and Pu	Emergency mode switch	
	Socket modem	**RS422**	**RS232**
	1	GND	GND
X2	2	TX-	DSR
	3	TX+	DTR
	4	GND	GND

	5	RX-	RX
	6	RX+	TX
	PE	Earth terminal	
X3	UB	Pulse generator operating voltage +5.2V	
	IG	Pulse input	
	GND	Pulse generator ground	
	ZV	Enabling contact (potential-free contact)	
	GND		
	LS +	Sensor (4-20 mA) operating voltage + or float switch	
	LS -	Sensor (4-20 mA) operating voltage - or float switch	
X4	RFID antenna connection		
X5	Display connection		
X6	Keyboard connection		
X7	USB port		
X8	Not used		
X9	Not used		

Switch

Switch	No.	Position	Operation
S1 (DIL switch)	1	On	Initialisation
		Off	Normal operation
	2	On	Programming
		Off	Normal operation

LEDs

LED	Function	Comments
18V	18 V operating voltage present	
5.2V	5.2 V operating voltage present	
DCD	Serial interface signal DSR active	Remote station operational
DTR	Serial interface signal DTR active	HDA eco operational
RxD	Serial interface signal RX active	Send data
TxD	Serial interface signal TX active	Receive data

Notes
The relay contact for the pump motor is protected by fuse F1 (6.3 A slow-blow, 5x20).
When exchanging the battery, use exclusively type CR2032 (3 V lithium). The battery used has a minimum shelf life of five years.
Pay attention to the polarity (pin 1) when retrofitting a socket modem for the RS232 or RS422 data interface.
The float switch is connected to X3, LS+ and LS-. It must be implemented as a normally closed switch (open = low medium)

Appendix B: Menu structure: Management Operation

Dispensing data menu

Display dispensing events
Deleting dispensing events
No. of dispensing events
USB report - dispensing events

Totals menu

Display totals
Delete totals
USB report – totals
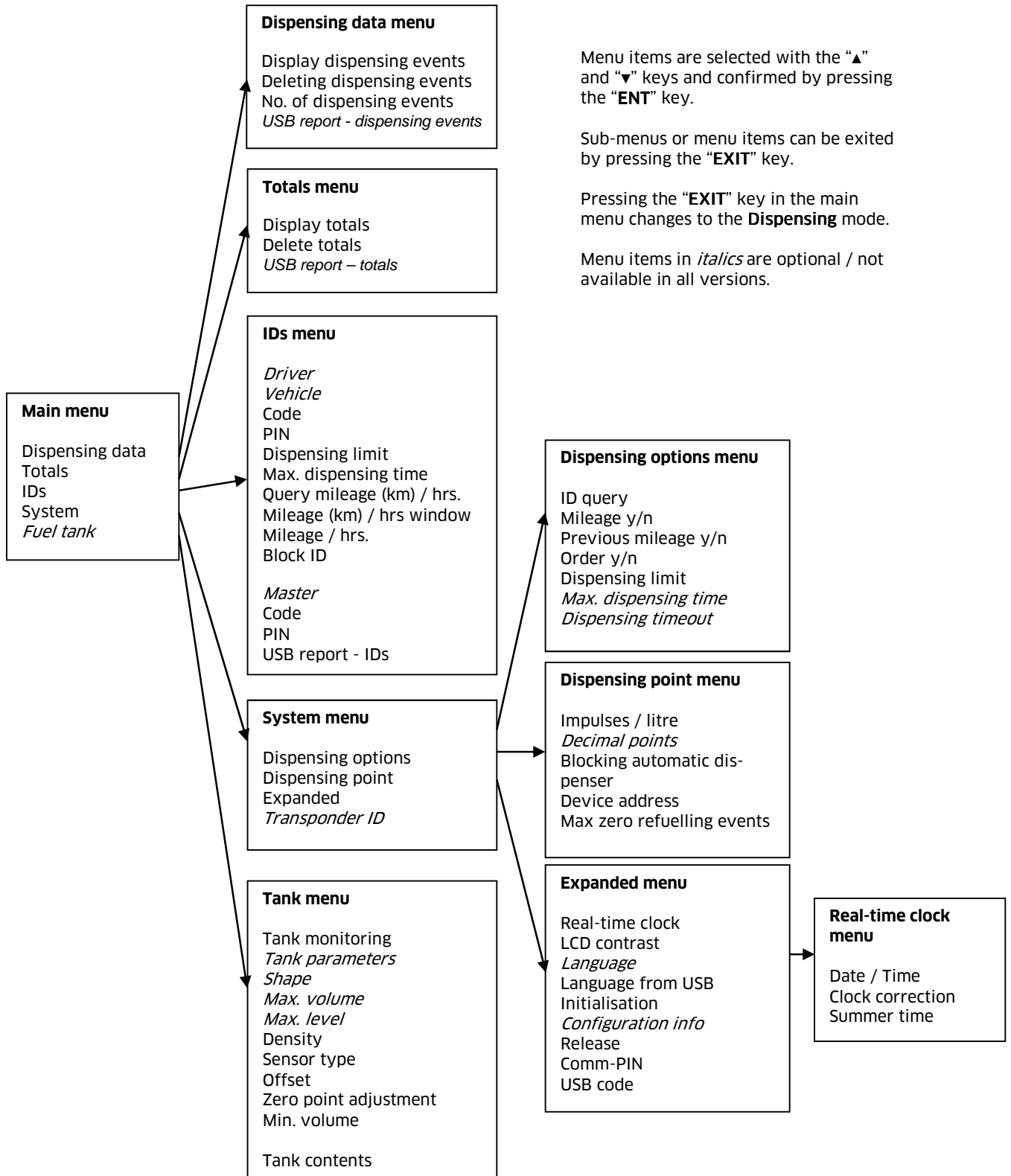
Menu items are selected with the "▲" and "▼" keys and confirmed by pressing the "**ENT**" key.

Sub-menus or menu items can be exited by pressing the "**EXIT**" key.

Pressing the "**EXIT**" key in the main menu changes to the **Dispensing** mode.

Menu items in *italics* are optional / not available in all versions.

IDs menu

Driver
Vehicle
Code
PIN
Dispensing limit
Max. dispensing time
Query mileage (km) / hrs.
Mileage (km) / hrs window
Mileage / hrs.
Block ID

Master
Code
PIN
USB report - IDs

Main menu

Dispensing data
Totals
IDs
System
Fuel tank

Dispensing options menu

ID query
Mileage y/n
Previous mileage y/n
Order y/n
Dispensing limit
Max. dispensing time
Dispensing timeout

Dispensing point menu

Impulses / litre
Decimal points
Blocking automatic dis-
penser
Device address
Max zero refuelling events

System menu

Dispensing options
Dispensing point
Expanded
Transponder ID

Expanded menu

Real-time clock
LCD contrast
Language
Language from USB
Initialisation
Configuration info
Release
Comm-PIN
USB code

Real-time clock menu

Date / Time
Clock correction
Summer time

Tank menu

Tank monitoring
Tank parameters
Shape
Max. volume
Max. level
Density
Sensor type
Offset
Zero point adjustment
Min. volume

Tank contents

Appendix C: Data export or import via USB memory stick

Refuelling and ID data are written as a file to the USB memory stick or read from it (ID data only). The data is processed with the HD Manager eco program. It is preferable to use the USB memory stick included in the scope of supply or available as a special accessory; the suitability of third party makes cannot be guaranteed.
A maximum of approx. 240 files can be created on the USB memory stick. A corresponding error message is displayed if this number is exceeded. In this case older files are to be deleted.

Export of refuelling data
In the first export, all existing and not yet exported refuelling data are saved in the file 'DATA0001.TXT'. For all subsequent transmissions, all newer refuelling data are saved in the files 'DATA0002.TXT', 'DATA0003.TXT' and so on; i.e. a new file with an incrementing index is generated for each export procedure. If older files are deleted, moved or renamed, the procedure starts with 'DATA0001.TXT' again.
Export of ID data
ID data for drivers or vehicles are automatically saved in the file 'DATAOUT.TXT'. If the data are to be exported again at a later time (e.g. because new vehicles have been created), then this file must be deleted, moved or renamed. It will then be created again at the next data transfer.

Import or restoring of ID data
A previously saved ID data file 'DATAOUT.TXT' can be read into the HDM eco again by being renamed or copied to 'DATAIN.TXT'. This file can be also be created by the HD Manager eco program. After the transfer the restored file is renamed '_DATAIN.TXT', so that it is not read in again next time. Any already existing file with the name '_DATAIN.TXT' will be overwritten.

Refuelling data format
Each file comprises up to 2,000 consecutively numbered fuelling data records.
Each refuelling data record is written in a line closed by CR, LF. The data fields are separated by a comma.

Data fields:
-       Dispenser no.(numerical, two-digit),
-       Dispensing point no.(numerical, two- digit),
-       Dispensing No. (numerical, five-digit)
-       Driver (numerical, four-digit),
-       Vehicle (numerical, four-digit),
-       Order (alphanumerical, eight-digit),
-       Mileage (numerical, eight-digit),
-       Quantity [L] (numerical, four integer digits, decimal point, post decimal positions.),
-       Product-no. (numerical, two-digit),
-       Date (DD.MM.YY),
-       Time (HH.MM).
-       Checksum (sum of all characters modulo 256 in ASCII representation)

Example:
```
01,01,00001,0001,0001,Test   1,00000100,0001.000,01,04.06.02,15:35,3B
01,01,00002,0002,0002,Test   2,00000200,0002.000,01,04.06.02,15:35,41
01,01,00003,0003,0003,Test   3,00000300,0003.000,01,04.06.02,15:35,47
01,01,00004,0004,0004,Test   4,00000400,0004.000,01,04.06.02,15:35,4D
01,01,00005,0005,0005,Test   5,00000500,0005.000,01,04.06.02,15:35,53
```

ID data format

Each file comprises up to 4000 ID data records, with a maximum of 2000 for drivers and 2000 for vehicles.

Each data record is written to CR, LF closed line when doing so. The data fields are separated by a comma.

Data fields:

- ID type (numerical, one-digit: ,1': Driver ID, ,2': Vehicle ID),
- ID number (numerical, four-digit),
- ID code (alpha numerical, max. ten-digit),
- ID pin (numerical, max. five-digit)
- ID blocked (numerical one-digit'0': no, '1': yes,)
- Entry mileage (km) / operating hrs. (numerical, one-digit, '0': mileage (km), '1': operating hours.)*
- Mileage window: (numerical, four-digit)*
- Max. dispensing time in minutes (numerical two-digit)*
- Dispensing limit in litres (numerical, four-digit)*
- Checksum (sum of all characters modulo 256 in ASCII representation)

*Values are only applicable to vehicles and ignored for drivers

Example:
```
2, 0001,        123,        , 0, 0, 1000, 15, 0999,F7
2, 0123, 011A342F02, 55555, 0, 0, 1500, 15, 1100,EF
2, 0003,          3,        , 0, 0, 0000, 00, 9999,D8
2, 0004,          4,        , 0, 0, 0000, 00, 9999,DA
2, 0005, 0F0068FD24,        , 1, 0, 0000, 00, 9999,BC
```

Generation of a language file

A new language file has to be examined and approved by HORN TECALEMIT. Please contact customer service at HORN TECALEMIT.

A faulty language file can impair the operation of the automatic dispenser.

The name of the language file is specified as 'LANGUAGE.CSV'.

Language file format

Each file consists of a number of lines. Each line contains two data fields separated from each other by comma or semicolon and corresponds to a unique text entry. Spaces between the data fields are not permitted and may possibly be considered to be part of the text. Each line must be closed by CR, LF.

Data fields:
Unique text ID (numeric, maximum three-digit) each text in the user guidance is as-signed exactly one ID
Text (1 - 16 characters) translation of the original text. Characters will be cut off if the maximum text length is exceeded.

Example:
```
0,Yes
1,No
2,Tank level
…
```

HORN
TECALEMIT

Konformitätserklärung
Declaration of Conformity

Hiermit erklären wir, dass die Bauart
We herewith declare that the construction type

Typ:
Type:
HDM 60 eco / HDM 80 eco

Bezeichnung:
Designation:
Zapfsäule für Diesel
Diesel pump

Artikel-Nr.:
Item No.:
110700860, 110700880

in der von uns gelieferten Ausführung folgenden einschlägigen Bestimmungen entspricht:
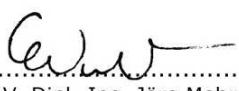*in the form as delivered by us complies with the following applicable regulations:*

- Maschinenrichtlinie 2006/42/EG
  Machinery safety 2006/42/EC

- EMV-Richtlinie 2004/108/EG
  Electromagnetic compatibility 2004/108/EC

Angewendete harmonisierte Normen:
Applied harmonised standards:

EN ISO 12100-1, -2   EN 60204-1

EG-Dokumentationsbevollmächtigter: Jörg Mohr   Horn GmbH & Co. KG
EC official agent for documentation: Munketoft 42
                                                            24937 Flensburg

12.05.2011   ....
Datum   i.V. Dipl.-Ing. Jörg Mohr
Date   Entwicklungsleiter / *Engineering Manager*

Appendix E: Declaration of conformity of the A2010 nozzle

Horn GmbH & Co. KG hereby declares the conformity of the A2010 automatic nozzle to DIN EN 13012 and the general building authority test certificate P-TÜ7-01340.