HORN TECALEMIT

Operating Manual

TruckLine

Tank truck management System 2084 (MID)

Translation of the original operating manual GB

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

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1 Safety notes

1.1 General safety notes

Regulations relating to use

You must observe the following points for your own safety:

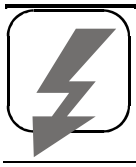
The device **TWM 2084.XX 01 (AI) explosion-proof** version may only be used to dispense products belonging to hazard class AI or lower, as defined in section 3 of the German Ordinance on Flammable Liquids (*Verordnung über brennbare Flüssigkeit*).
Products from a hazard class higher than AI are therefore not permitted to be dispensed.

The device **TWM 2084.XX 01 (AIII) non-explosion-proof version** may only be used to dispense products belonging to hazard class AIII, as defined in section 3 of the German Ordinance on Flammable Liquids (*Verordnung über brennbare Flüssigkeit*).
Products from a hazard class higher than AIII are therefore not permitted to be dispensed.

1.1.1 Safety Symbols

The following symbols are used for safety notes in these operating instructions.

Warning – this symbol warns you about operating errors. Failure to follow the instructions can lead to a system error and/or material damage.



Danger – this system warns you about immediate threats to life or health or about extensive material damage.

1.1.2 Regulations relating to use

You must observe the following points for your own safety:

The device **TWM 2084.XX 01 (AI) explosion-proof** version may only be used to dispense products belonging to hazard class AI or lower, as defined in section 3 of the German Ordinance on Flammable Liquids (Verordnung über brennbare Flüssigkeit).
Products from a hazard class higher than AI are therefore not permitted to be dispensed.

The device **TWM 2084.XX 01 (AIII) non-explosion-proof** version may only be used to dispense products belonging to hazard class AIII, as defined in section 3 of the German Ordinance on Flammable Liquids (Verordnung über brennbare Flüssigkeit).
Products from a hazard class higher than AIII are therefore not permitted to be dispensed.

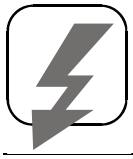
Installation, start up, repair and maintenance activities

System installation and start up, as well as all repair work may only be carried out by service workshops and truck body manufacturers that have been specifically authorised by Horn-Tecalemit.
You are only permitted to carry out the maintenance activities outlined in **Chapter 7 – Servicing and maintenance**.

For your own safety, do not tamper with the electrics. Any damag
injury caused in this way will not be covered by the warranty.

ESD

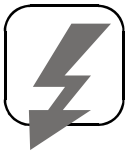
Even in everyday conditions, persons and objects can acquire an electrostatic charge through friction that can accumulate many thousands of volts. Contact with a conductive object, such as an electronic component, discharges this potential voltage. The resulting equalising current and the associated electromagnetic fields can destroy electronic components.



Do not touch any electronic components in the system. Electrostati
charge (ESD) can lead to the malfunction or destruction of the elect
components.

Removing the front panel on the electronic volume meter

To insert the parameter module, you have to open the front panel of the electronic volume meter (EMZ).
If you are using the explosion-proof version TWM 2084.XX 01, you must abide by the following safety instructions.

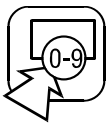


Danger of explosion! Explosion-proof systems must be switched off using the main TWM switch (= the current must be switched off) **at least 15 minutes** before the front panel on the electronic volume meter is opened (= before the screws are undone).

You may never open the TWM device in hazardous atmospheres!

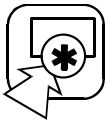
In addition to the safety symbols described, there are two other types of symbols that are used in this manual:
Action symbols
Message symbols

Action symbols

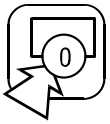


Enter one or more figures

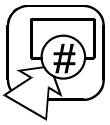
Enter one of more letters



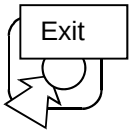
Press the *-key



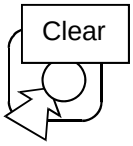
Press the zero (0)-key



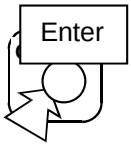
Press the #-key



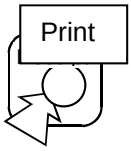
Press the Exit key.



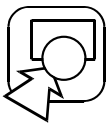
Press the Clear key.



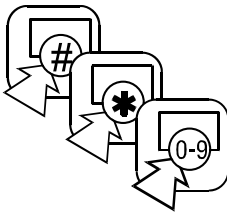
Press the Enter key.



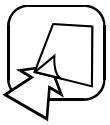
Press the Print key.



Press any key.



Key symbols are „overlapped“ if different key functions lead to the same result.



Insert paper in printer

Remove paper from printer

Filling

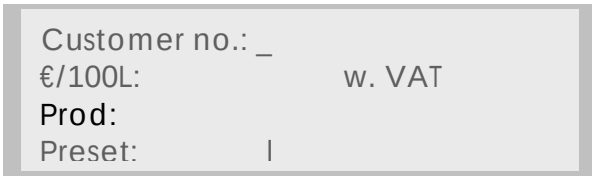
Message symbol

Information – this symbol stands for important information and hints you should read.

2.1 Display

The display information is printed in a grey rectangle which corresponds to the display of the electronic volume meter. It contains 4 text lines and the corresponding clear text.
System functions that cannot be deactivated are printed in black.
In contrast, all parameter-dependent system functions, which can be deactivated by the operator, are printed in grey:

Display



Cross reference

Bold refers to cross references to other chapters and is used for emphasis.

Marginals

These key words help you find certain text paragraphs more quickly and are printed in the left-hand margin of the page.

3 Introduction

By choosing to implement the TWM 2084 tank truck management system, you have made the right decision for thoroughly modernising your fleet.
As a supplier of electronics components for filling stations, Horn-Tecalemit has many years of experience in volume measurements subject to calibration. We have used this experience to your advantage during the development of the 2084 tank truck management system.
The TWM 2084 is an electronic dispensing system that controls all dispensing functions, ensures exact temperature-volume compensation and, thanks to its many integrated system services, provides you with business transparency and clear cost savings. The menu-driver user interface also ensures *that* the system is easy to use.

The TWM is available in the following versions:

-Explosion-proof
For dispensing products in hazard category AI.
-Non-explosion-proof
For dispensing products in hazard category AIII.

Should you encounter problems that you are unable to solve yourself using these operating instructions, you can contact your service workshop, truck body manufacturer or our technical customer service at any time.

3.1 Brief description

During dispensing, the TWM 2084 electronically measures the exact volume of mineral oil products. If a temperature-volume compensation is required for the mineral oil product, the temperature of the medium is measured during dispensing and the volume dispensed is converted to the basis temperature on a product-specific basis.
The TWM 2084 also enables you to do the following during dispensing:
- Preset the required dispensing volume by volume or amount
- Calculate the exact delivery price using an individual base price multiplied by the volume dispensed
- List the sale of additional products on the delivery receipt
- Print the delivery receipt (invoice or delivery note) on the spot and immediately after dispensing has been completed

The electronic volume meter (EMZ) saves the trip and delivery data for all dispensing tasks. Integrated system statistics provide you with a complete overview of all delivery operations made by the tank truck in question.

The TWM 2084 can also be easily modified. A small number of parameters enable the system to be adapted to meet your individual business requirements. These dedicated parameter settings and the calibration parameters are always saved externally in parameter modules, as well as in the EMZ itself. This enables you to set up all TWM 2084 systems easily and securely.

4 Performance features

The following list provides an overview of the most important features and functions available in the TWM 2084:

Simple installation	All connectors and valve controls are integrated into the volume meter; there is no need for a separate cable box
Flexible system design	Parameters allow the system to be individualised It can be modified to meet new business conditions at any time
Parameter module	Easy storage of parameter values once they have been set Simple transfer to other TWM 2084 systems with the same software version Storage of article data for additional products
Access protection	All system functions can be protected by a 4-figure PIN (driver and master code)
Operational security	All components are highly resistant to vibrations and variations in power, moisture and temperature
Clear user interface	Menu-driven using a graphical display Multilingual user interface and printout options (the printout language can be set independently of the interface language) Wear-resistant, piezoelectric keypad with clear text labelling Clear text notes are issued if the system is operated incorrectly
Preset value for dispensing	Either a volume or amount can be preset
Price calculation function	The electronic volume meter can be used as a price calculator and is included in the standard version Individual entry of base prices for each dispensing operation and options for correction after dispensing is complete Options for including additional products on the delivery receipt
Creation of receipts	Creation of invoices or delivery notes (using the base price that has been entered) Multiple languages available for the printing of receipts
Receipt format	Receipts can be individualised using receipt parameters Three different receipt categories can be stored
Data buffering	Using batteries (battery change every 4 years and at calibration)

Statistics	Copies of delivery receipts for the last 100 dispensing operations Totals counter per product and cumulative Trip log
Additional printouts	List of customer parameters List of receipt parameters List of calibration parameters
Duplicate measuring system	Parallel control of two measuring points (side A and B) using 1 EMZ

5 System description

Function types

The TWM 2084 has three types of functions:

PTB functions
These are specified by the German PTB national metrology institute; they control dispensing operations and temperature-volume compensation. The PTB functions cannot be influenced by the operator.

Parameter-dependent system functions
These are additional functions that you or the service workshop/truck body manufacturer can activate or deactivate to meet your business requirements by using customer parameters.

Parameter-independent system functions
These are preset in the system and cannot be changed or deactivated. The statistics and service functions are parameter-independent.

TVC

The specific compensation factors for the mineral oil product in question must be entered in the EVM as a prerequisite for ensuring that temperature-volume compensation (TVC) is carried out correctly. If the TVC for a mineral oil product is prescribed by law, the corresponding TVC values are set for this product when your dispensing system is calibrated. TVC is then active for this product.
During the dispensing operation, the EVM receives quantity data from the pulse generator (uncompensated volume) and information about the current temperature of the medium from the temperature sensor (operating temperature). The EVM then uses a fixed compensation function and the product-specific TVC values to calculate the quantity dispensed (compensated volume) when converted to the basis temperature.

Components

The TWM 2084 consists of the following components:

- EVM with integrated cable clamps
- Pulse generator
- Temperature sensor
- Magnet valves
- Printer and printer connector with TDL interface (in driver's cab)
- Overfilling protection system

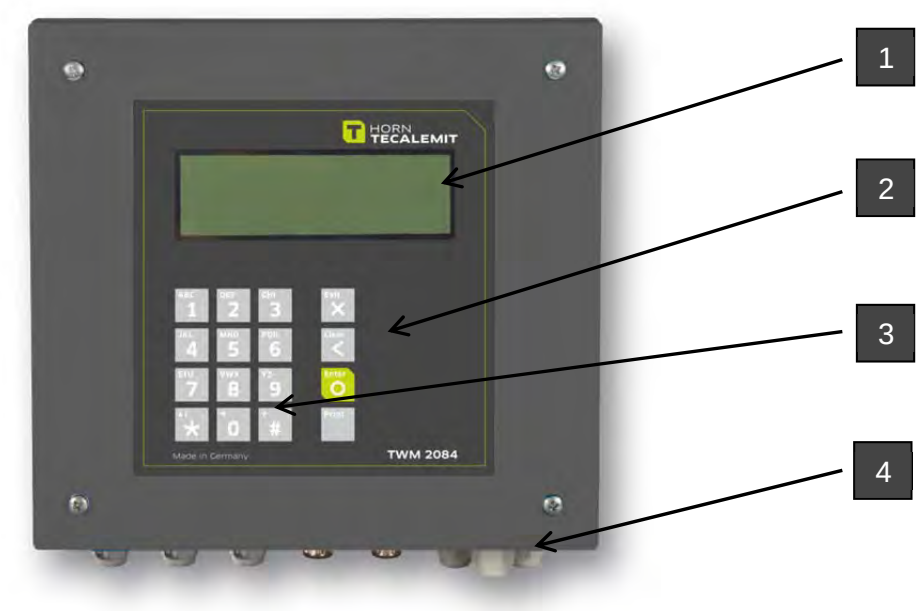
5.1 Electronic volume meter

The electronic volume meter (EVM) is the intelligent core of the TWM 2084. Its operating controls are used to enter all data and to specify system settings. The EVM controls all system functions:

- Temperature-volume compensation (TVC)
- Price calculation
- Parameter settings and storage
- Storage of all product and delivery data
- Storage of additional product data
- Preparation of the printer for delivery receipts and statistics
- Control of the magnet valves and additive pump
- Control of the overfilling protection system

5.2 Versions

Explosion-proof (model number 2084.XX 01



Non-explosion-proof (model number 2084.XX 00)

EVM components

Display

Function keys

Alphanumeric keypad

Feedthroughs for leads for peripheral devices and the power supply

5.3 Pulse generator

The pulse generator is connected to the measuring chamber and converts the chamber's mechanical rotations into electrical pulses. These pulses are transmitted to the EVM and are used as values for the uncompensated volume that has been dispensed.

Horn-Tecalemit provides pulse generators suitable for all common measuring chambers.

The pulse generator is always an explosion-proof model.

Pulse generator

5.4 Temperature sensor

The temperature sensor is integrated into the dispensing line and constantly measures the temperature of the fluid as it is flowing past. The temperature values are transmitted to the EVM, which then determines the exact average temperature (operating temperature) for the amount that has been dispensed.

The temperature sensor is a resistance thermometer based on a PT 100 model (according to DIN standards). The temperature sensor model used is dependent on the system version (explosion-proof/non-explosion-proof).

The temperature sensor connection is sealed when the TWM 2084 is calibrated.

Temperature sensor (non-explosion-proof version)

5.5 Magnet valves

Magnet valves are used to release and cut off fluid for dispensing operations and as a locking mechanism when changing between hoses.

Magnet valves for the TWM 2084 are always explosion-proof, irrespective of the system version.

5.6 Printer

As with all other EVM system components, the inked ribbon printer is controlled via a data cable.

To enable easy installation in the driver's cab, the printer is mounted on a base at the factory.

A voltage stabiliser ensures that the printer has a constant 24 V power supply.

On printer model TM 295, the power can be turned on using the ON – OFF button on the side of the printer.

During standard usage the switch must always be in the ON position.

Printer TM 290/ 295 mounted on a base

5.7 LRC

LRC (Level Remote Control) is a radio-controlled filling security system. It offers protection against tank overfilling and adds a remote control feature to the EVM.

LRC-Small:
- EVM Software 2084.75.100.21
- Connected to EVM via control wires
- Limit value indicator connected via cable
- Remote control without display

LRC3:
- EVM-Software 1.2.0.12
- Connected to EVM via CAN-bus
- Limit value indicator connected via cable
- Remote control with LC-display

6 Start-up

Your truck body manufacturer will install and start up the TWM 2084.

Before the truck body manufacturer sets the customer and receipt parameters, you must jointly determine the scope of services and thus the parameter values required, to ensure that the TWM 2084 meets your operational requirements.

During final calibration of the TWM 2084, calibration technicians will enter any missing calibration parameters into the electronic volume meter (EVM) counter.

Before handing the tank truck over to you, the truck body manufacturer will have backed up all the parameter settings of your TWM 2084 to two parameter modules.

Upon handover, you will be able to use the TWM 2084 straight away.

7 Operation

This chapter provides you with step by step instructions on how to operate the TWM 2084 and is divided into three sections:

- Operating features
- Menu structure
- Operating procedures

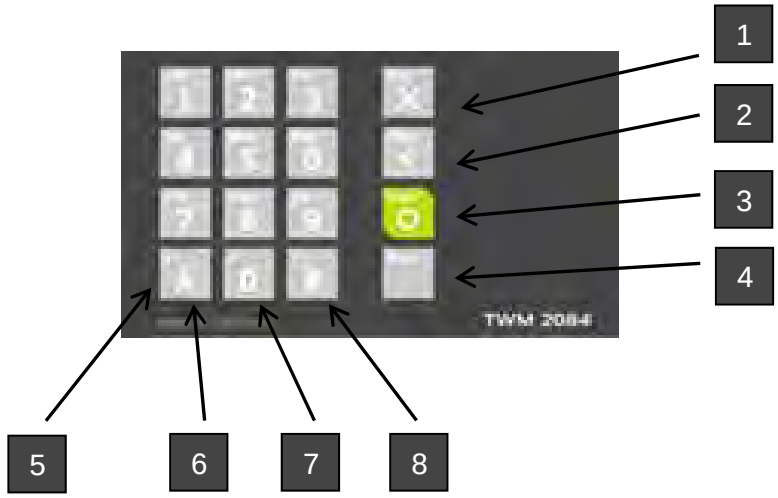
If you need to use the system immediately, start by reading **Chapter 5.1 Operating features** followed by **Chapters 5.3 Operating procedures** and **5.3.1 Activating/ deactivating the system**.

7.1 Operating features

7.1.1 Electronic volume metre (EVM)

Keypad

The EVM's piezoelectric keyboard is pressure-sensitive. The level of pressure sensitivity is set using **parameter 154** (see **Chapter 6.2.2 Customer parameters**),



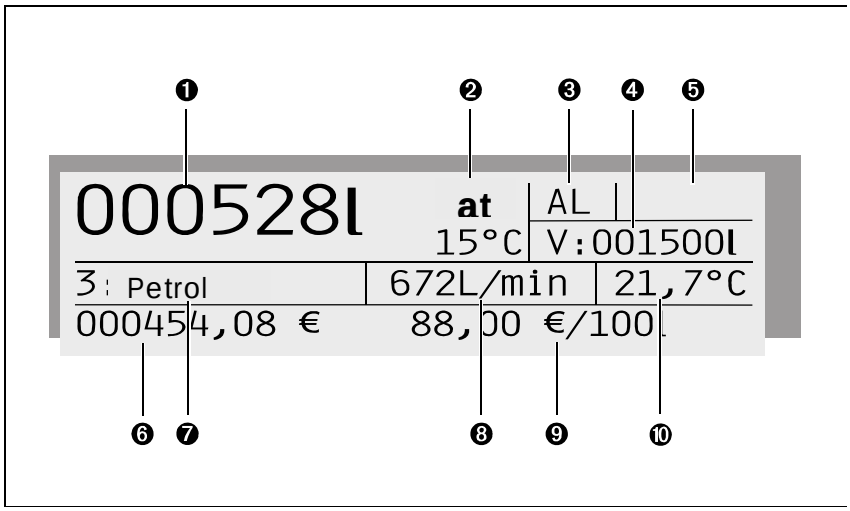
Electronic volume metre keypad

	Key	Function
1	Exit	To end a process and return to the previous menu level
2	Clear	To amend the value entered
3	Enter	To confirm the value entered
4	Print	To start printing the delivery receipt and trip report
5	10-key keypad	To enter numbers and letters
6	⇩ *	To go back (for example, from parameter 71 to parameter 70) or switch between measuring points on the dual measuring system
7	⇨ 0	To enter a space (only when entering letters)
8	⇧ #	To move on (for example, in menus with more than four menu items)

Display

The graphic display is a back-lit liquid crystal display (LCD).
You can set the display contrast using **parameter 153**. The default menu lan-

guage is German. If necessary, you can select a different language by using **parameter 155**. Use **Parameter 184** to activate the language selection for the dialog languages German, French and Italian.



EVM display showing information when dispensing at one measuring point (single and dual measuring system)

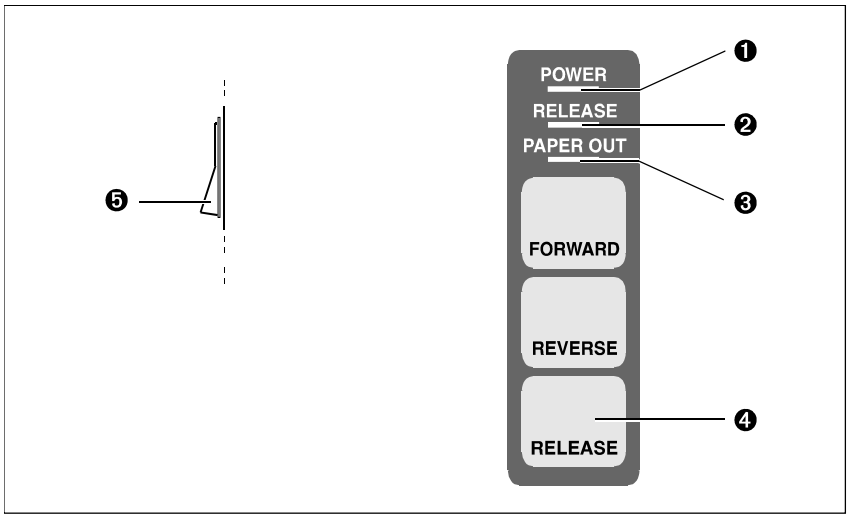
	Display field for:	
1	Dispensing volume	(Updates during dispensing operation)
2	Dispensing with TVC	('at 15°C'; blank without TVC)
3	Dispensing status	(F = filling; R = run-on; EF = end of filling; PR = printing)
4	Preset value	(For example: 1,500 l)
5	Functional problems while dispensing	(For example: ERR10)
6	Cumulative price display without price calculator: preset value displayed)	(only when entering basic price incl. VAT;
7	Dispensing product with product number	
8	Flow speed	(Display depends on **parameter 163**)
9	Basic price per 100 l	
10	Average temperature	(Display depends on **parameter 164**)

7.1.2 Printer

Press the release key (4, fig. 5-3) once before the first paper feed after the system start. For all further printing activities, simply load the paper into the printer in a right-aligned position, inserting it until it hits the rear paper guide; once loaded the paper will be automatically fed into the printer.

However, if two EVMs are connected to a printer, the automatic paper feed must be deactivated using **parameter 158**. In this situation, press the receipt or function key to feed the paper into the printer when printing begins.

You can use **document parameter 26** to set the paper ejection direction for the printed sheets (only TM 290/295 printer).



Operating field on TM 290/295 printer

	Component	Function
1	Power indicator light	Printer on/off
2	Release indicator light	Release on/off
3	Paper out indicator light	Illuminates when there is no paper
4	Release key	Before paper feed (after system start)
5	Switch	ON/OFF

7.1.3 LRC

7.2 Menu structure

The following table shows the TWM 2084's menu with all available system functions, including the calibration functions.

Main menu Level 1	Sub-menu Level 2	Level 3	Level 4
1: Filling	1: Continue filling 2: New basic price 3: Prices 4: Add. products 5: Temp. vol. comp. (TVC)		
2: Start trip/ terminate trip			

3: Statistics	1: Trip report 2: Totalizer 3: Last filling data	1: Current report 2: Last report 1: Product totals 2: All totals 3: Print totals	
4: Service	1: Receipt parameters 2: Customer parameters 3: Load into module 4: Load into TWM 5: Date/time 6: Test temperature 7: Add. products 8: Product names*) 9: Calibr. parameters *) 0: Calibration *)	1: View/modify 2: Print 3: Load basic values 1: View/modify 2: Print 3: Load basic values 1: New date 2: New time 1: View/modify 2: Load into module 3: Load into TWM 1: View/modify 2: Load into module 3: Load into TWM 1: View/modify 2: Print 3: Load basic values 1: Autom. calibration 2: Measur. no. = 1	1: Add. products 2: Unit name 3: Additive pump
5: Service 2	1: PC filling 0 = no 1 = yes 2 = Terminal mode 2: Diagnostics		

*) Functions solely for calibration purposes

7.3 Operating procedures

This chapter provides you with comprehensive descriptions of all the TWM 2084's functions.

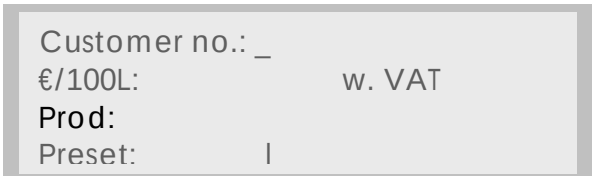
Notes on lay-out

The individual steps of each operating procedure are described. On the left of the text, the activity described or the key to be pressed will also be shown as a symbol, thus enabling you to quickly find functions which are new to you.

Maximum operation

We would like to highlight that the operating instructions always describe the maximum operation, meaning that all parameter-dependent system functions are active.
For clarity purposes, these instructions distinguish the non-disengageable (parameter-independent) from the disengageable (parameter-dependent) system functions in the displays shown as examples:

Non-disengageable functions:	black text
Disengageable functions:	grey text



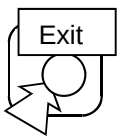
If any of disengageable system functions described are not part of your system's operating procedures due to the individual parameter settings, simply skip the section. Continue from the point at which the description is once again applicable to your system.
Most of the disengageable (parameter-dependent) system functions relate to dispensing operations and access protection.

General operational rules for the TWM 2084:

Call-up a function

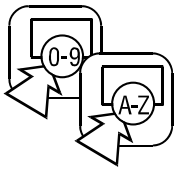
Use the ten-key keypad to enter the number which appears on the left of the function. The system will immediately initiate the selected function and/or change to the next submenu level without you having to press any further keys.

Cancelling a function



You can terminate a function at any time by pressing 'cancel'. The system will automatically return to the previous menu level. Each time you press 'exit' again, the system will go back up a level until it reaches the main menu.

Entering a value



Use the ten-key keypad to enter the desired value (regardless of whether the entry field is in numerical or alphabetical form). Once you have entered all the characters, complete the entry by pressing ‘confirm’.

Correcting a value

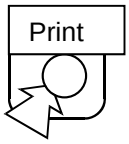
If you notice that the last value entered was incorrect before you confirm the entry, you can use the clear key to delete it. The cursor will return to the start of the entry field and you can enter a new value.

Printer paper feed

The paper is automatically fed through the printer. The release key on the printer only needs to be pressed before the first paper feed after the system start.

If two EVMs are connected to a printer, the automatic paper feed (paper catch) function must be deactivated by using the setting **parameter 158** = 0.

Authorising printing



The print key on the TWM 2084 starts printouts except for those of the parameter and totalizer lists. These two lists can be printed by using the corresponding menu function.

Always insert the appropriate paper or form into the printer before printing and only then press ‘receipt’ or select the menu item to initiate the print task. The form or paper to be printed on should not be punched on the right-hand side. (If this is the case, the printer will register that it has run out of paper).

If two EVMs are connected to a printer, print tasks can only be started for one EVM at a time. While a print task is running for one EVM, no print task may be initiated from the other connected EVM.

When driving

Parameter 159 on the system provides the option for the TWM 2084 to automatically deactivate after a set period (in minutes). However, the automatic deactivation function only works if the TWM 2084 is display-ing the main menu. Even after automatic deactivation, the system is still ready and can be reactivated at any time by pressing any key.

While travelling, the cover of the lorry equipment box must be closed.

Operating error

The TWM 2084 reacts to an incorrect operation or an invalid entry by displaying an appropriate error message in clear text.

Safety instructions

When working with the TWM 2084, please note both the safety instructions provided in the individual procedural descriptions and the general safety guidelines in **Chapter 1.3 Safety instructions**.

7.3.1 Switching the system on/ off

(1) Switching the system on

The system can only be started after the main TWM switch has been switched on. The main switch is generally located in the tank truck's cab.

Procedure:

Switch on the main TWM switch.

Self-test

While starting up, the system conducts a self-test to see whether the EVM pulse generator, temperature sensor and programme memory are working properly.

If an error is detected which prevents the system from being ready to use, an appropriate error message appears on the display.

If the self-test is successful, the system information is briefly displayed. The main menu then appears:

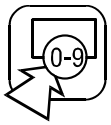
```
1: Filling
2: Start trip
3: Statistics
4. Service
```

You can now work with the system by selecting the desired menu item.

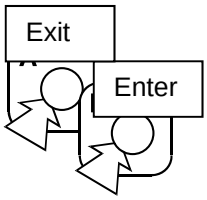
Text language selection

Parameter 184 provides you with the option of activating/ deactivating the language selection (German, French or Italian) for the text on the display (see **Chapter 6.2.2 Customer parameters, section (1) Operating parameters**). If the language selection is active, the language selection menu will appear after the system start and system test.

```
1:DEUTSCH
2:FRANCAIS
3:ITALIANO
```



You can directly select one of the text languages displayed by entering the corresponding number ‘1, 2 or 3’.



Alternatively, by using the exit or enter keys you can use the language which was installed the last time the system was started.

After following this procedure, the main menu will be displayed in the selected text language.

Reactivating the EVM

To reactivate the TWM 2084 which has been deactivated while travelling, press any key.

(2) Freezing the system information

System information displays:

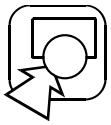
- Program release version
- EVM ID
- Cancelling a function

By pressing any key during the system start, the self-test can be paused to enable you to note the system information in case you need to provide it in the event of queries from the technical customer services, the service workshop or the truck body manufacturer.

Procedure:

After using the main TWM switch to activate the system, the system information is automatically shown on the display:

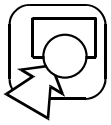
```
P: 2084.75.100.12
```



Press any key if you wish to freeze the display.

The display will automatically move on after a minute or if you press any key again:

```
02.98  00000011
     0000000888
2084.72.053,02
31101999
```



The display will automatically move on to the main menu after a minute or if you press any key again:

The display will automatically move on after a minute or if you press any key again:

```
1: Filling
2: Start trip
3: Statistics
4: Service
```

(3) Switching the system off

The main TWM switch can be left on while travelling between dispensing locations. However, it is wise to deactivate the TWM 2084 during the journey.

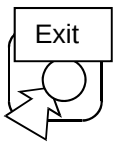
Parameter 159 enables you to specify a time period in minutes (5 – 40) after which the TWM 2084 will be automatically deac-tivated, providing it is displaying the main menu. After the TWM 2084 has been deactivated, the system is still in stand-by and can be reacti-vated at any time by pressing any key.

At the end of the trip, the TWM main switch can be used to switch the system off completely.

Procedure:

The system displays the main menu:

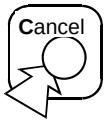
```
1: Filling
2: Start trip
3: Statistics
4: Service
```



Press ‘exit’.

```
Switch off:
Press Cancel
Press any other key
to continue
```

Deactivating the EVM



Press ‘exit’ again. The TWM 2084 will be deactivated.

Switching off the system

Now switch off the main TWM switch as well.

7.3.2 Dispensing

All the functions which are required for a complete delivery pro-cess can be found under menu item ‘1: Filling’: from the entry of dispensing-specific information to the actual process of dispensing and the sale of additional products through to the on-site genera-tion of receipts.

The TWM is available in the product-related system versions:

- For dispensing products of hazard category AI
- For dispensing products of hazard category AIII

And as a dispensing system in the following versions:

- Single calculator
- DoubleCalculator

7.3.2.1 Dispensing with a single measuring system

The basis version of the TWM 2084 is fitted with a single cal-cu-lator. This means that the EVM controls a single measuring/ dis-pensing point (measuring point, side A).

Maximum operation

In terms of systems with a single calculator, this manual com-pre-hensively describes the maximum dispensing operation with all parameter-dependent system functions.

The overall dispensing procedure is divided into the following sections:

(1) Preparing the dispensing operation
(2) Dispensing
(3) Finishing the dispensing operation
(4) Printing the delivery receipt
(5) Post dispensing operation functions
(6) Terminate filling without printing a receipt

7.3.2.1.1 Preparing the dispensing operation

Before you can begin dispensing, the system requires one or more details, depending on the individual parameterisation of your TWM 2084.

Skipping the additional function

You can switch off the activated parameter-dependent system functions:

- Recording the customer number
- Price calculation function
- Preset value

before dispensing by simply pressing ‘confirm’ without entering any values. The cursor (a flashing ‘_’ mark on the display) will automa-tically jump to the next entry field and the function which has been skipped will be switched off for this dispensing operation.

Mixed products (program version 7 and above), i.e. products into which an additive is injected in a predefined mixing ratio, should only be dis-pensed using preset values. These values ensure that shortly before the limit stop no further additive will be injected. This prevents residual additives from remaining in the pipe and the measuring chamber and ensures that the next fluid to be dispensed does not contain residual additives.

Procedure:

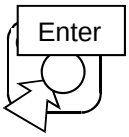
The system displays the main menu:

```
1: Filling
2: Start trip
3: Statistics
4: Service
```

Enter ‘1’.

```
Please enter driver
or master code
      _
```

If this message appears, the dispensing function has been access-protected by **parameter 200**. Depending on the parameter value, the system is now waiting for you to enter the appropriate four digit code.



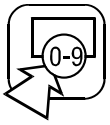
Confirm the code by pressing ‘enter’.

```
Start trip
```

If **parameter 161** has specified that the trip has to have started before the first dispensing operation, you will receive the message shown above and the system will automatically return to the main menu. Start the trip from the main menu using menu item ‘2: Start trip’ (see **Chapter 5.3.3 Starting/terminating trip**).

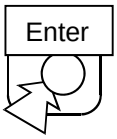
After starting the trip, you will once again need to select function ‘1: Filling’ from the main menu.

```
Customer no.: _
€/100L:          w/o VAT
Prod:
Preset:          l
```



Enter the customer number.

Parameter 156 controls the customer number function. At the same time, use the parameter values to establish the number of characters (3 - 8) the system should accept when the customer number is entered.



Confirm the customer number by pressing ‘enter’.

```
Customer no.: 1234
€/100L:    ___,__  w/o VAT
Prod:
Preset:          l
```

The cursor will jump to the field for entering the basic price ‘EUR/100l’ in the second line. Use **parameter 150** to define whether the system will generally work with or without a price calculator. The currency (for example ‘EUR’) is specified through the country setting during system calibration.

There is also an option (program version 7 and above) for you to set euros as the reserve currency by using **parameters 243** and **244** (see **Chapter 6.2.2 Customer parameters**). After changing to euros or setting euros as the currency, the EVM also uses the Euro sign on the display.

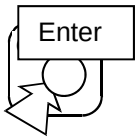
At the end of the entry field, you can see which basic price you need to enter, depending on the **parameter 151** setting:

- ‘With VAT’ = gross price
- ‘Without VAT’ = net price

Parameters 204, 206 and 208 are used to set, and where necessary amend, the VAT rates in the system (maximum of three).

For mixed products (main product with an additive), the basic price of the mixed product must be entered.

Enter the price as the three digits before the point and the two digits after the point. For example, for a price of 50.50 EUR/100l, you must enter '05050'. The point will be added automatically.

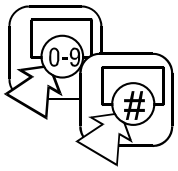


Confirm the basic price by pressing 'enter'.

```
Customer no.: 1234
€/100L:    060,00    w/o VAT
Prod:
Preset:           l
```

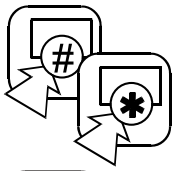
Setting the dispensing product

The cursor now appears in the third line, where you need to enter which product should be dispensed next.



You can select a product directly by entering the appropriate product number.

Alternatively, press '#' to display one of the dispensing products stored in the system.

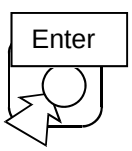


Press '#' to move on to the next dispensing product(s).

Press '*' to return to previous product(s).

If only one dispensing product has been stored in the system, this will usually be displayed; it is therefore not possible to make a selection.

Products which have been blocked are also not available for selection (a description of how to block or reactivate dispensing products can be found in Chapter 5.3.5.7 Managing additional products, Section (1.3) Additive pump).

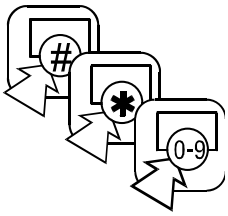


Confirm the product selection by pressing 'enter'.

If using program version 7 or above, you can also dispense mixed products (products with an additive) (see **Chapter 5.3.5.7 Manage additional products, Section (1.3) Additive pumps**).

Setting the mixing ratio

If the selected product is a mixed product, the system will automatically display the most recently selected mixing ratio.
The cursor will now appear in the mixing ratio entry field. Use this field to establish the mixing ratio in which the additive should be injected into the product. Up to four fixed missing ratios can be stored in the system (see **Chapter 5.3.5.7 Manage additional products, Section (1.3) Additive pumps**).

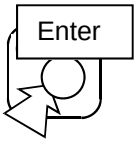


Press '#' to move from one 'fixed MIX' mixing ratio to the next.

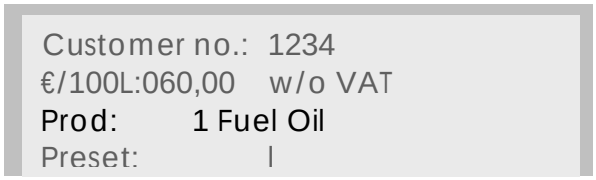
Press '*' to return to the previous mixing ration.

Alternatively, you can establish a mixing ratio by entering a desired 'variable MIX' value (between 1:500 and 1:4000) if the 'variable MIX' mixing option is allocated to the mixed product.

If only one 'fixed MIX' mixing ratio has been stored in the system for the mixed product, this will usually be displayed; it is therefore not possible to make a selection.



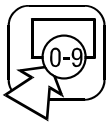
After selecting the desired mixing ratio, press 'enter'.



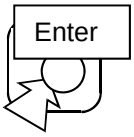
The fourth line can be used to enter a preset value.
You can use **Parameter 162** (units digit) to define whether the function has preset values and how the preset value can be entered: in litres (volume preset), in euros (amount preset)

The tens digit of the parameter establishes which property the preset value takes on when dispensing is continued (see **(5.1) Continue filling**).

If the setting **parameter 162** = 3 has used, the entry can be made as either a volume or an amount. Press '#' to switch between the two options before entering the preset value.



Enter the preset value.



Confirm the preset value by pressing 'enter'.

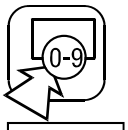
```
Customer no.:  1234
€/100L: 060,00        w/o VAT
Prod:      1 Fuel Oil
reset:     001500     I      OK?
```

The cursor will appear in the 'OK?' field. Check that all the entries are correct.

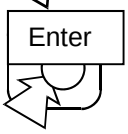
Correcting an entry

Where necessary, you are still able to correct one or more entries:

Press 'clear'. The cursor will return to the customer number in the first entry line.

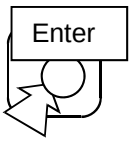


If you need to amend the first value, use the ten-key keypad to enter the new value. The old value will be overwritten.



Confirm the new value by pressing 'enter'.

Repeat this process until you reach the final entry line.



When you reach the end, all the entry values are correct, confirm the question 'OK?' by pressing 'enter'.

Display test

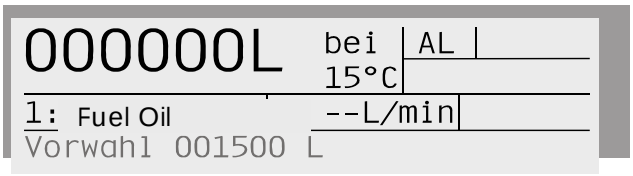
Confirming the input values starts the display test. All the display items will go dark for a second and then light for a second. If the display test is successful, the dispensing screen will appear on the display. The release valve will open and the system is now ready for dispensing.

7.3.2.1.2 Dispensing

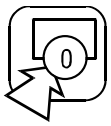
The dispensing preparations are complete. All entries are correct. The filling hose and the limit indicators are connected. Dispensing can begin.

Procedure:

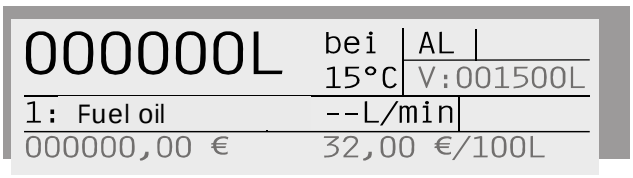
Open the corresponding dispensing product chamber valve and start dispensing.



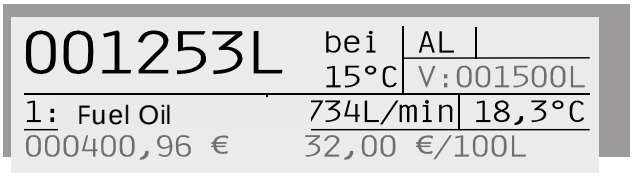
The compensated/ uncompensated accumulative volume is shown on the display throughout the dispensing operation (an explanation of the dispensing screen display fields can be found in **Chapter 5.1.1 Electronic Volume Metre, Section (2) Display**).



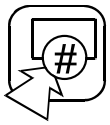
While dispensing, you can use the '0' key to switch between the compensated and uncompensated volumes on the volume display. Each time you press '0', the volume display will switch from the compensated to uncompensated volume and vice-versa.



When a basic price is entered <u>with</u> VAT, the amount display runs in the bottom line. If the product is dispersed without a price calculator, the preset value is displayed in this line.



Throughout the dispensing operation, the message 'AL' (dispensing) flashes in the status field. Use **parameter 163** to set the display value for the 'flow l/min' and **parameter 164** to set the 'average temperature' display. If both displays can be activated with the # key, the following sequence applies:



‘#’ is pressed once: ‘flow l/min’ is displayed.

‘#’ is pressed twice: ‘average temperature’ is displayed.

‘#’ is pressed three times: ‘flow l/min’ and ‘average temperature’ are displayed simultaneously.

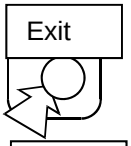
Pressing ‘#’ a forth time deactivates both values.

7.3.2.1.3 Finishing the dispensing operation

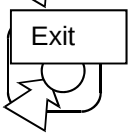
Dispensing operations finish when:

- You abort the operation
- The limit indicator deactivates the operation
- The preset value is reached
- A fault occurs

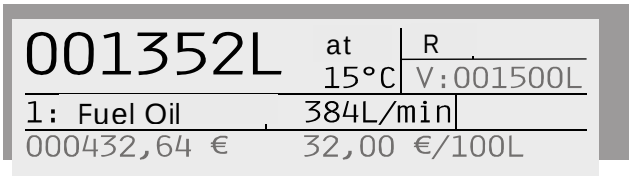
Procedure:



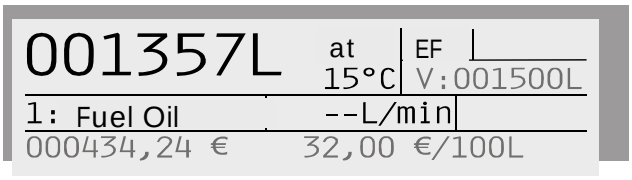
You can stop the dispensing operation at any time by pressing ‘exit’.



If the limit indicator deactivates the dispensing operation, you must also press ‘exit’ to inform the system that the dispensing operation has finished.
If a preset value has been reached, the system knows that the dispensing operation has finished; there is no need to press ‘exit’.



‘R’ flashes in the status field to show the cool-down period.



The system then shows the message ‘EF’, which means that the dispensing operation has finished.:

- Receipt (see **(4) Print delivery receipt**)
- Clear (see **(5) Post dispensing operation functions**)

- Cancel (see (6) Finishing dispensing without printing a receipt)

7.3.2.1.4 Printing the delivery receipt

After dispensing operations, you should print a delivery receipt.

Selling additional products

If additional products are to appear on the delivery receipt, they must be entered into the system using the **Additional products** corrective function before the receipt is printed (see **Section (5.4) Additional products** in this chapter).

2 EVMs and 1 printer

If two EVMs are connected to a printer, print tasks can only be carried out for one EVM at a time. The EVM for which a print task is running displays 'DR' in the dispensing status field.

Do not start a new print task from the second EVM while another print task is running.

Invoice

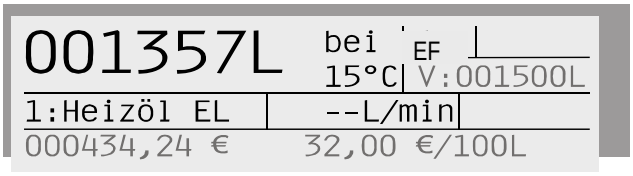
When printing receipts, ensure that it is only possible to print an 'invoice' which shows the basic price, VAT amount and total amount when the following conditions are fulfilled:

- The price calculator function is active and has been used by either a basic price being entered before the dispensing operation or a basis price being entered into the system using the 'new basic price' corrective function and
- The set/selected receipt type allows this information to be printed.

If these conditions are not fulfilled, the system automatically prints a delivery note.

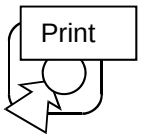
Procedure:

The dispensing operation has finished and the status field is displaying 'EF' (end of filling):



Insert the delivery receipt form into the printer. Ensure that it is pushed right up to the rear and right-hand guides.

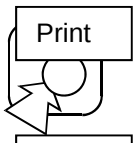
For the first paper feed after starting the system, you need to press the release key on the printer. The paper is then automatically fed into the printer.
If two EVMs are connected to a printer, the automatic paper feed function must be deactivated by using the setting **parameter 158** = 0. In this case, the paper will be fed into the printer once the invoice key has been pressed.



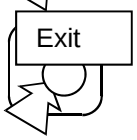
Start printing the receipts by pressing ‘printt’ on the EVM.

```
Please insert paper
Cancel:   abort printing
Confirm:  continue
Receipt:  repeat
```

If this message appears, first check if the receipt form has been correctly inserted.



Press ‘print’ to restart the print task.



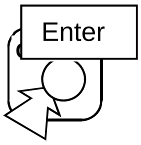
Alternatively, press ‘exit’ to end the procedure if it is not possible to print.

```
Receipt type:  1

Confirm or
Change (1-3)
```

if the setting **parameter 166** = 4 is used, you must define the receipt type before printing.

The system suggests the receipt type which was used for the most recent print task. If you wish to use a different document type for this delivery receipt, use the ten-key keypad to enter the corresponding number.

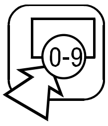
Please note that the receipt type can also be set using **parameter 166**. Only the information which is authorised for this receipt type can be printed.



Confirm the receipt type by pressing ‘enter’.

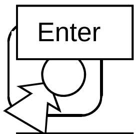
```
Receipt language:  0
(0-10)       :     0
Confirm or
change
```

When the setting **parameter 165** = 98 is used, you can select the language of the next delivery receipt before printing it.

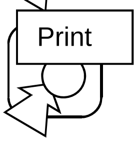


The system suggests the most recently selected language. If you wish to select a different language, enter the corresponding number on the ten-key keypad:

- 0 = German
- 1 = Italian
- 2 = French
- 3 = English
- 4 = Spanish
- 5 = Hungarian
- 6 = Czech
- 7 = Croatian
- 8 = Dutch
- 9 = Slovenian
- 10 = Polish

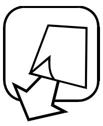


Confirm your language selection by pressing ‘enter’.



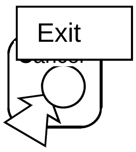
Start printing by pressing ‘print’.

```
001357L    at    | PR
          15°C   | V:001500L
1: Fuel Oil   --L/min
000434,24 €    32,00 €/100L
```



While printing, the status field displays 'PR' (printing).

When the print task has finished, remove the delivery receipt from the printer.



Press ‘exit’ to return to the main menu.

Printing from the main menu

You can also print the original (first print-out) or a copy of the delivery receipt of the last dispensing operation from the main menu

```
1: Filling
2: Start trip
3: Statistics
4: Service
```

by pressing ‘clear’.

All delivery receipts contain the following compulsory data, as you can see from the example printout below:

```
Counter no.          :        471101
Meas. system no.     :             1
Measur. number       :            23
Filling Date         :      05.07.98
- - - - - - - - - - - - - - - - - - -
Product             5:   liquid gas
*Volume at 15  deg.C:      3967 l*
```

Whether or not the measuring point number is printed out in relation to the counter number is established when the system is being calibrated.

What additional data is printed on the delivery receipt alongside the compulsory data depends on the individual receipt design of the different receipt types (see **Chapter 6.2.1 Receipt parameters**).

When using program version 7 or above, in addition to the national currency, the overall price information also prints two extra lines which show the exchange rate details and the amount of the second currency, if a second currency has been configured in the EVM (see **Chapter 6.2.2 Customer parameters, Section (4) Euro currency/ exchange rate parameters**).

7.3.2.1.5 Post dispensing operation functions

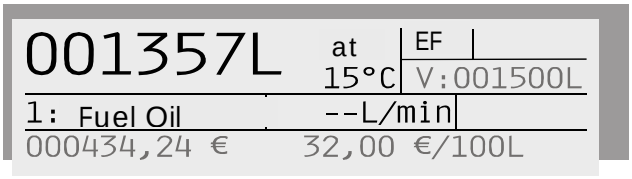
After dispensing operations, the system offers you the following functions in a sub-menu:

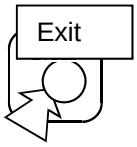
- Continue filling
- New basic price

- Prices
- Additional products (as extras)
- Temperature volume compensator (TVC)

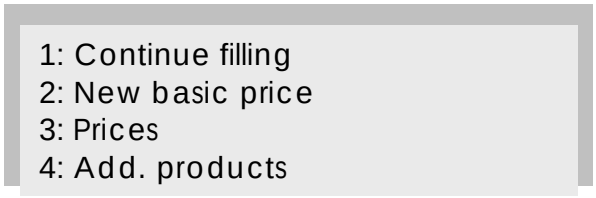
Procedure:

After the dispensing operation the display appears as below:





Press ‘exit’. The following sub-menu is displayed:



You can now choose one of these functions.

After each of these functions, you will again receive all the options provided at the end of the dispensing operation:

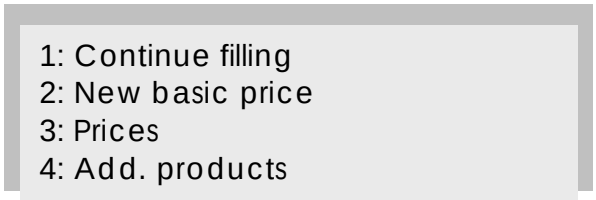
- Receipt
- Clear
- Cancel

Continue filling

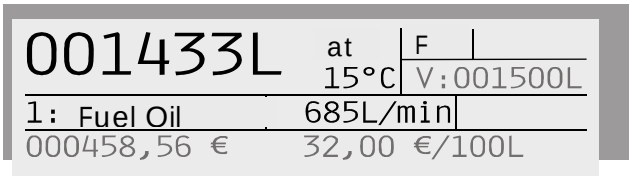
Use this function to continue dispensing.

Procedure:

The system automatically displays the correction menu after the dispensing operation has finished:

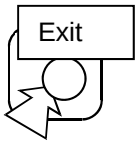


Enter ‘1’.



The system once again opens the release valve and you can continue dispensing.

The rest of the procedure is identical to that described in **Section (2) Dispensing**.



You can terminate the dispensing operation again by pressing ‘exit’.

Time limits for continued dispensing

Parameter 185 monitors the time period (1 to 29 minutes) in which the continued dispensing operation is permitted after the initial dispensing operation was stopped. By default, there is no set time period (see **Chapter 6.2.2 Customer parameters, Section (1) Operating parameters**).

Preset value as difference or total

You can use **Parameter 162** (tens digit) to establish whether when continuing dispensing after a dispensing operation with previously defined preset values, the newly entered preset values are classed by the EVM as the difference or as a total in relation to the overall dispensing operation (see **Chapter 6.2.2 Customer parameters, Section (1) Operating parameters**).

New basic price

After dispensing and as long as the price calculation function is active (**parameter 150** = 1), you can use this function to:

- Amend the basic price established before dispensing (if, for example, the order volume and the dispensed volume clearly differ)
- Retrospectively enter a basic price (even if the price calculator function was skipped by not entering a basic price before dispensing).

Procedure:

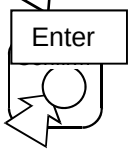
Once the dispensing operation has finished, the system displays the correction menu:

```
1: Continue filling
2: New basic price
3: Prices
4: Add. products
```

Enter '2'.

```
€/100L:  _ _ _ , _ _ w/o VAT
```

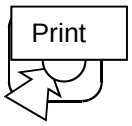
Enter the new basic price as the three digits before the point and the two digits after the point.



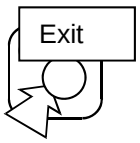
Confirm the basic price by pressing 'enter'.

```
€/100L :          31,85 w/o VAT
w/o VAT   000383,38 €
w. VAT            000456,41 €
```

The EVM uses the 'new basic price' to calculate the new total amount with and without VAT.



Press 'print' if you wish to print the delivery receipt at this point. Once the print task has finished, the data on the delivery receipt can be directly compared to that on the display.



By pressing 'exit' the data will reappear after the dispensing operation has finished.

Prices

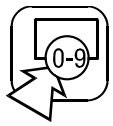
If the price calculator was used for the dispensing operation, you can use this function to view the basic price, the total amount with and without VAT and the dispensed volume.

This view is first and foremost of interest if the basic price was entered without VAT, as this means that the amount display does not run during dispersing. Standard K.P. 151 defaults to 0.

Procedure:

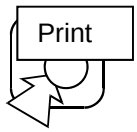
Once the dispensing operation has finished, the system displays the correction menu:

```
1: Continue filling
2: New basic price
3: Prices
4: Add. products
```

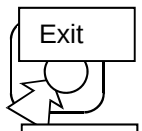


Enter ‘3’.

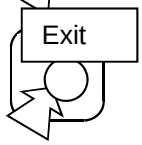
```
€/100L :          27,52  w/o VAT
w/o VAT : 000383,38 €
w VAT :           000456,41 €
01433 L
```



Press ‘print’ if you wish to print the delivery receipt at this point.
Once the print task has finished, the data on the delivery receipt can be compared to that on the display.



By pressing ‘exit’ you can return to the correction menu.



If you press exit’ again, the data will reappear after the dispensing operation has finished.

(5.4)Additional products (as extras)

After the dispensing operation has finished, you can use this function to create up to four additional products which appear on the delivery receipt with the following information:

- Sales price per unit
- Quantity sold
- Amount

The additional products (max. 15) are added to the system using service function ‘7: Additional products’ (see **Chapter 5.3.5.7 Manage additional products**).

Procedure:

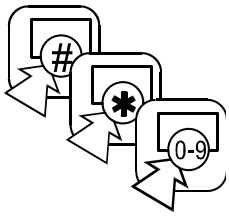
Once the dispensing operation has finished, the system displays the correction menu:

```
1: Continue filling
2: New basic price
3: Prices
4: Add. products
```

Enter ‘4’.

```
20: Add1
```

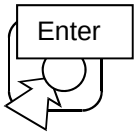
The most recent product to be added to the system is automatically displayed. Select the additional product which should be included on the delivery receipt:



Press ‘#’ to move on to the next additional product.

Press ’*’ to return to the previous product.

You can also select any of the additional products directly by entering the additional product number (from 20 to 34).

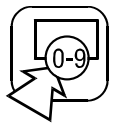


Confirm your additional product selection by pressing ‘enter’.

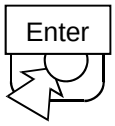
The display will now show the information saved in the system about this additional product, the basic price per quantity unit and the basic unit:

```
20:   Add1
060,00 €/L
Volume: 000    L
Amnt. w/o VAT00000,00 €
```

The cursor appears in the second line by the basic price per quantity unit.



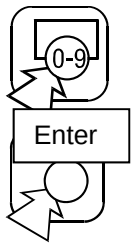
You can use this basic price or, if necessary, overwrite it.
If you overwrite the price, you must enter the new basic price (net price) in the format of the digits before and after the point. For example, for a price of 58.50 EUR/l, you need to enter '05850'. The point will be added automatically.



Confirm the basic price by pressing 'enter'.

```
20:   Add1
058,50      €/L
Volume: 000     L
Amnt. w/o VAT 00000,00 €
```

The cursor will now have moved to the purchased quantity entry field in the third line.



Enter the sales quantity (without preceding zeros).
For example, for two litres, enter the number '2'.

Confirm the quantity by pressing 'enter'.

```
20:   Add1
058,50      €/L
Volume:         002   L
Amnt. w/o VAT 00117,00
```

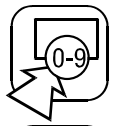
The EVM calculates the total net amount for the sales quantity and displays it in the fourth line.

The additional product appears on the delivery receipt with the values which can be seen on the display.

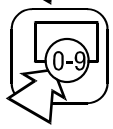
The cursor returns to the selection field for the additional product number in the first line.

Correcting an entry

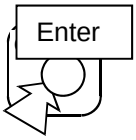
Before printing a receipt, you can correct any of the values entered as follows:



Select the additional product for which the value(s) need to be corrected by entering the additional product number.



Overtype the value to be corrected (basic price, sales quantity).



Confirm the value by pressing 'enter'.
Confirm' must also be pressed if you wish to retain a value as it is.

Ending a

The values must be correctly entered for all additional products

selection

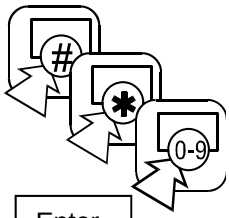
(maximum of four per delivery receipt). The cursor has returned to the first line.

Press ‘exit’ twice in succession. The information from the end of the dispensing operation will reappear on the display.

Cancelling a selection

Before printing a receipt you can cancel your selection at any time.

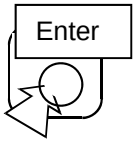
Select the product number of the additional product that should no longer appear on the delivery receipt (an additional product which has been selected to appear on the delivery receipt can be recognised because the display shows values for this additional product on all four lines):



Press ‘#' to move on to the next additional product.

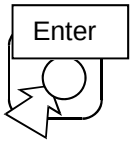
Press ‘*’ to return to the previous product.

You can also select any of the additional products directly by entering the additional product number (from 20 to 34) and



pressing ‘enter’.

Once the display shows the additional product for which the selection should be cancelled, press 'clear'.



Press ‘enter’ again.

All the values in the second, third and forth lines will be deleted from the display and the additional product will no longer appear on the delivery receipt.

Press ‘exit’ to terminate the function. The correction menu will reappear.
By pressing ‘exit’ again the dispensing operation finished display will reappear.

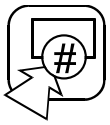
Temperature-volume compensator (TVC)

If a temperature-volume compensator is used for the dispensing operation, you can use this function to view the temperature-volume compensation values.

Procedure:

The system automatically displays the correction menu after the dispensing operation has finished:

```
1: Continue filling
2: New basic price
3: Prices
4: Add. products
```

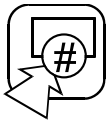


Where desired, press # to move down the display list.

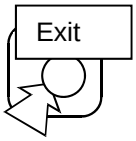
```
2: New basic price
3: Prices
4: Add. products
5: Temp. vol. comp.
```

Enter ‘5’ to select the function.

```
Compensated:001357 L
Uncompensated:    001360 L
Average temperature:    18,3°C
```



In the temperature-volume compensation screen, the # key can be used to change between rounded litres and unrounded litres (0.1 litres) for the volume format. This makes it possible to review the accuracy of dispensing operations even between calibration dates (# decimal place display).



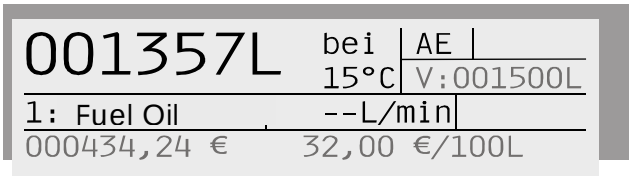
Press ‘cancel’ to terminate the view. The correction menu will reappear on the display.
By pressing ‘exit’ again the dispensing operation finished display will reappear.

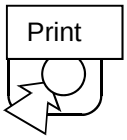
7.3.2.1.6 Terminate filling without printing a receipt

Generally, a receipt should be printed after every dispensing opera-tion. If it is not possible to print a receipt because the printer is faulty, follow the procedure outlined below to terminate the dispensing func-tion without printing a receipt.

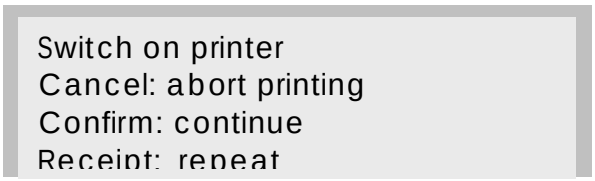
Procedure:

The dispensing operation has finished:

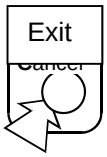




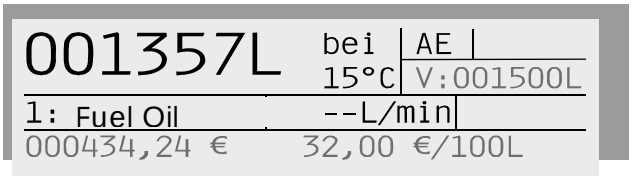
Press ‘print’. This represents an operator signature (yes, I have provided a hand-written receipt).



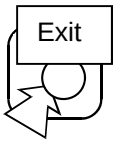
The EVM detects that the printer is not ready and displays the message ‘switch on printer’. If you have simply forgotten to switch on the printer, then do so now and print the delivery receipt.



If it is not possible to print, press ‘exit’.

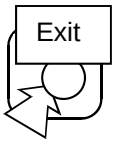


Following this procedure means that you have conducted the print attempt required by the system.



Press ‘exit’.

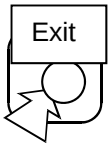
```
Please print
receipt!!!
Receipt: Print
Cancel: Abort filling
```



Press exit again.

```
Manual receipt?

Confirm:  yes
Cancel:   no
```

In the event of a zero dispensing operation, you can exit the dispensing function directly and return to the main menu



by pressing ‘exit’ once.

7.3.2.2 Dispensing using a dual measuring system

The TWM 2084 is optionally available as a dual measuring system. In this design version, the EVM can simultaneously manage two dispensing operations (sides A and B).

Operational rules

The general operational rules described under **5.3 Operational procedures** are also applicable for the dual measuring system. As before, you can switch off the activated parameter-dependent system functions:

- Recording the customer number
- Preset value

by pressing ‘confirm’ without entering any values.

Additional operational rules when using the dual

measuring system:

Price calculator

In contrast to dispensing with a single measuring system where a basic price can be entered while preparing the dispensing operation, when using the dual measuring system, it is only possible to activate the price calculation function after the dispensing operation. This is done by using function '3: Basic price' in the correction menu (the procedural description can be found under **(1.2) Correction menu** in this chapter).

Changing the measuring point

Press '*' at any time to switch back and forth between measuring point A (left-hand side of the display) and measuring point B (right-hand side of the display). The other functions which can be executed with this key when using the single measuring system are not permitted when using the dual measuring system.

When using the dual measuring system, the sole purpose of the * key is to switch between measuring points A and B.

Operating measuring points

Measuring points A and B can be independently operated. Please note however that it is only possible to operate the measuring point which is active at the time (top line in the display is inverted, i.e. white text on a black background).

Dispensing mixed products

When operating in double calculator mode, mixed products which are clearly defined in the system can **only** be dispensed by one measuring point (side A or B).

A definition of mixed products can be found in Chapter 5.3.5.7 Manage additional products, Section (1.3) Additive pump.

Restart dispensing

In double calculator mode, a new dispensing operation can be started even if the other dispensing operation has not yet finished; you can access the dispensing preparation screen while a product is still being dispensed from the other side.

Measuring point numbers

The measuring point numbers of measuring points A and B (numbers '001' and '002' in the example) are set when calibrating the system. Measuring point numbers are entered as 3 digits. This means that

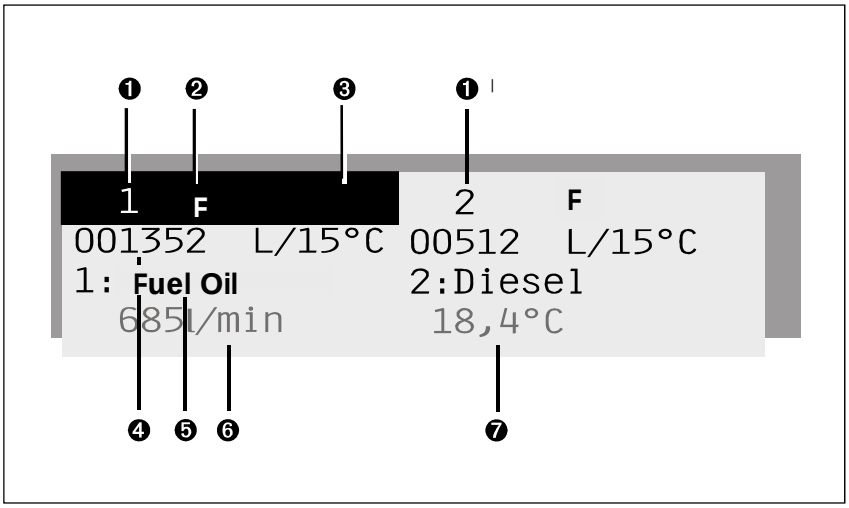
measuring point numbers can range from 1 to 999.

Reduced operation

A comprehensive description of the maximum operation of dispensing with all parameter-dependent system functions can be found in **Chapter 5.3.2.1 Dispensing with a single measuring system**. The following description only outlines the procedural steps which are specific to dual measuring systems or which differ from those for the single measuring system.
The chapter is divided into the following sections:
(1) Simultaneously dispensing from both measuring points
(2) Dispensing from just one of the two measuring points.

Simultaneously dispensing from both measuring points

The display for simultaneous dispensing operations has the following layout:



F

Fig 7-4: EVM graphic display when simultaneous dispensing from two measuring points

Display field for:

(1) Measuring point number for measuring point A; left-hand side of the display (if a measuring point is active, i.e. can be operated, the colours in the top line of the display are inverted).

(2) Measuring point number for measuring point B; right-hand side of the display

(3) Display field for function errors during the dispensing operation

(4) Dispensing volume (updates during dispensing, at '/15°C' when dispensing with TVC)

Display field for:

(5) Dispensing product with product number

(6) Flow speed (Display depends on **parameter 163**)

(7) Average temperature (Display depends on **parameter 164**)

7.3.2.2.1 Preparing, carrying out and finishing the dispensing operation

Procedure:

The system is in the starting position:

```
1: Filling
2: Start trip
3: Statistics
4: Service
```

Enter ‘1’.

```
Filling from
1: Meas. syst. 1
2: Meas. syst. 2
3: Both meas. systems
```

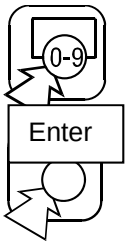
Enter ‘3’.

The display divides into two columns:

```
1                2
Cu-No:  _        Cu-No:
P                P
 P:   L           P:   L
```

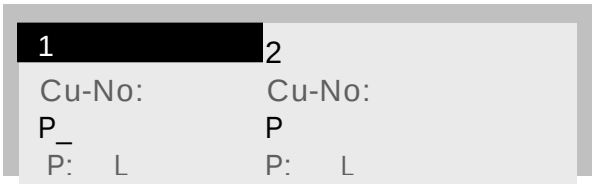
The colours in the top line for measuring point A (measuring point number ‘001’ in the example) are inverted in the display. The inverted image shows that measuring point A can be operated. You now also have the option to move on to measuring point B (measuring point number ‘002’) and start a simultaneous dispensing operation with measuring point B. The order of the dispensing op-

erations can be user defined.

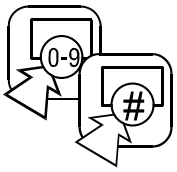


If desired, enter the customer number.

Confirm the entry by pressing ‘enter’.

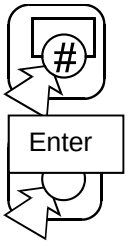


The cursor now appears in the third entry line for product selection.



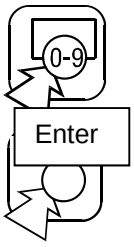
You can select a product directly by entering the appropriate product number.

Alternatively, press ‘#’. One of the dispensing products stored in the system will be displayed.



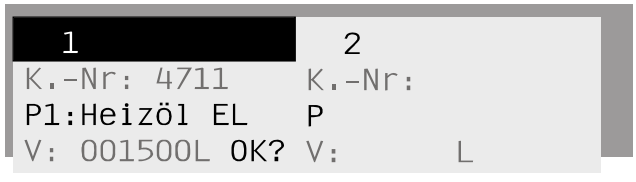
Press ‘#’ to move on to the next dispensing product(s).

Confirm the product selection by pressing ‘enter’.

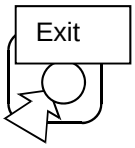


Enter the desired preset value.

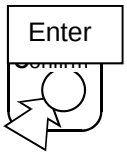
Confirm the entry by pressing ‘enter’.



The cursor will appear in the ‘OK?’ field. Check that all the entries are correct.

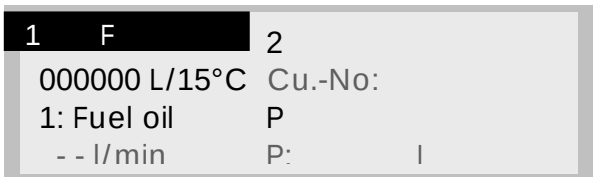


If the entries are not correct, press ‘exit’ and repeat the procedure for preparing a dispensing operation.



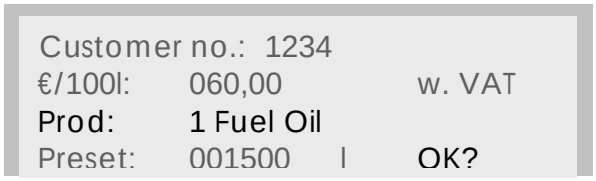
If all the values entered are correct, press ‘enter’.

Confirming the values entered starts the display test. All the display items will go dark for a second and then light for a second. The display test runs separately for measuring points A and B and also only for the measuring points for which the dispensing operation preparations have been completed. If the display test is successful, the dispensing screen will appear on the display. The release valve will open and the system is now ready for the dispensing operation.



Switching to measuring point ‘002’

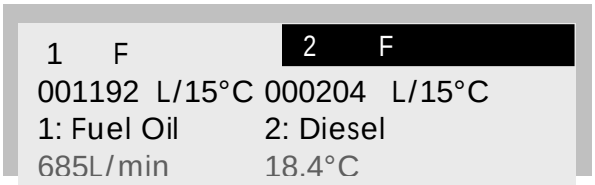
Press ‘*’ to change to measuring point ‘002’.



Enter the data for measuring point ‘002’ and start dispensing from this measuring point.

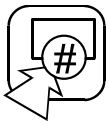
During the dispensing operation

Dispensing occurs simultaneously from both measuring points:



During the dispensing operation, the flow speed per minute and the current product temperature can be displayed in turn. The display values are defined by the **parameter 163** and **parameter 164**.settings. When us-

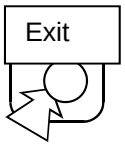
ing the dual measuring system, only one of the parameters for the permanent display can be set to parameter = 1. If you wish to display the second value as well, you must use the setting parameter = 2. You can now choose to display the second value.



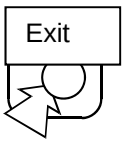
Press '#' to switch between the flow speed and the current product temperature of the activated measuring point (provided that both these dispersing data items should be viewed). Press '#' again to switch off the display:

Finishing dispensing operations

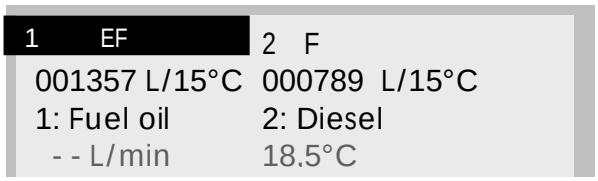
Please note that to manually finish a dispensing operation, the corresponding measuring point '001' or '002' must be active.



Press 'exit' to finish the dispensing operation.



If the limit indicator deactivates the dispensing operation, you must also press 'cancel' to inform the system that the dispensing operation has finished.
If a preset value has been reached, the system knows that the dispensing operation has finished; there is no need to press 'exit'.



After the dispensing operation

The following functions are also available to you in the dual measuring system mode once dispensing operations have finished:

- Correction menu
- Print receipt

These functions can be executed at any time for the dispensing process which has already finished, even if the dispensing operation from the second measuring point is still running.

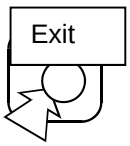
Correction menu

As when using the single measuring system, the following correction menu functions are available to you when using the dual measuring system:

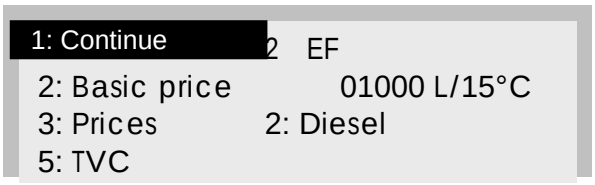
- Continue filling
- New basic price
- Prices
- Temperature-volume compensator (TVC)

Additional products can only appear on a delivery receipt when dispensing from one measuring point. If dispensing occurs from both measuring points at the same time, the sale of additional products can however still be listed on a separate receipt by conducting a 'zero dispensing operation' (= dispensing volume of zero litres) from one of the measuring points. The additional products can be recorded for this 'zero dispensing operation' (a description of this process can be found in **Chapter 5.3.2.1 Dispensing with a single measuring system, Section (5.4) Additional products).**

Procedure:



You can access the correction menu by pressing 'exit'.

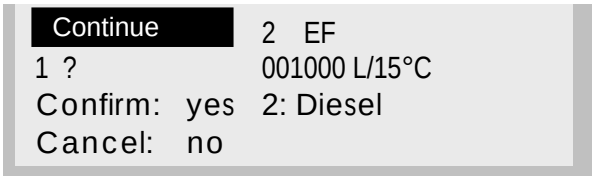


After each of these functions, you will again receive all the options provided at the end of a dispensing operation.

Continue filling

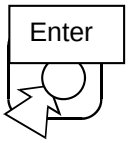
The activated measuring point reopens the release valve. Dispensing can continue:

Enter '1'

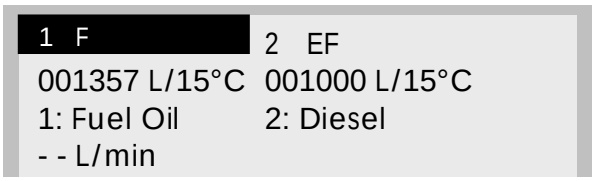


This additional query again shows the measuring point number of the measuring point which reopens the re-

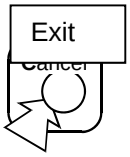
lease valve to enable dispensing to continue.



If this is the measuring point for which dispensing should continue, press ‘enter’.



„F’ in the status field shows that dispensing can be continued (shown under measuring point A = ‘001’ in the example).

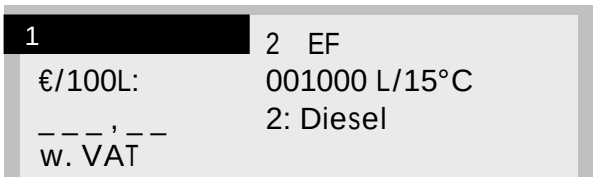


Press ‘exit’ to stop the continued dispensing again.

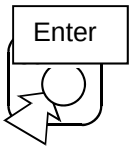
Basic price

This function can be used to activate the price calculator:

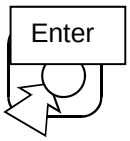
Enter ‘2’.



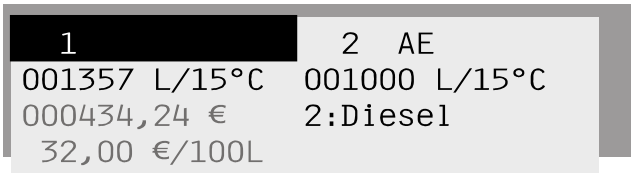
Enter the basic price, including the decimal places. For example, 32.00 EUR must be entered as ‘03200’. The point will be added automatically.

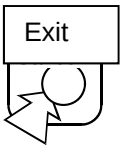


Confirm the basic price entry by pressing ‘enter’.



Press ‘enter’ again.



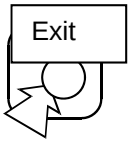


To return to the correction menu, press ‘exit’.

Prices

Displays the basic price, total net and gross amount and the dispensing volume.

Enter ‘3’

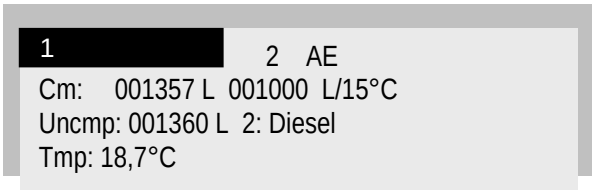


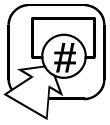
To return to the correction menu, press ‘exit’.

Temperature-volume compensator (TVC)

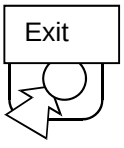
Used to display the compensated and uncompensated dispensing volumes and the average dispensing temperature when a temperature-volume compensator (TVC) is used during a dispensing operation.

Enter ‘5’.





In the TVC screen, the # key can be used to change between rounded litres and unrounded litres (0.1 litres) for the volume format. This makes it possible to review the accuracy of dispensing operations even between calibration dates.



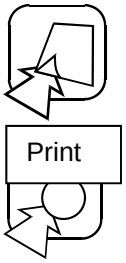
To return to the correction menu, press ‘exit’

Print receipt

A separate delivery receipt is printed for each measuring point. The information on the delivery receipt is the same as that on printouts for single measuring systems. However, the receipt also shows the measuring point number and/or the meter number which was used during the dispensing operation.

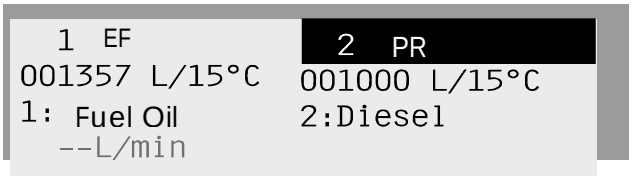
The delivery receipts for the simultaneous dispensing operations must be printed out successively. Do not start the second print task until the first delivery receipt has finished printing. If you try to start a second print task while the printer is already active, the message ‘printer busy’ will appear.

Procedure:



Insert the paper into the printer.

Press ‘print’.



While the delivery receipt is printing, the status field of the corresponding measuring point displays the letters ‘PR’ (printing).

Once the printout is complete, remove the delivery receipt from the printer.

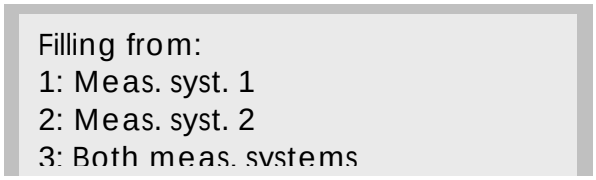
Dispensing from just one of the two measuring points

When using a dual measuring system, it is also possible to only dispense from one of the two measuring points (side A or side B).

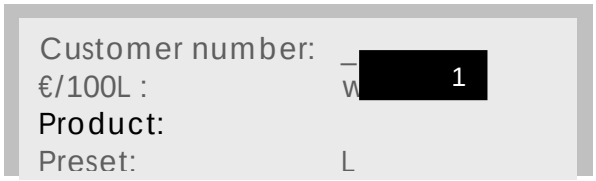
Procedure:

The system is in the starting position:

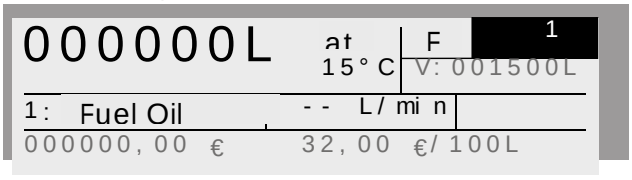
Enter ‘1’



Enter ‘1’ if you only wish to dispense from measuring point ‘001’. Enter ‘2’ if you only wish to dispense from measuring point ‘002’.



The inversely displayed measuring point number (in the upper right-hand corner of the display) shows which of the two measuring points has been selected for the next dispensing operation.



The system continues to display the measuring point which is in use throughout the dispensing operation.The remaining procedure is identical to the procedure for single measuring systems, which can be found in **Chapter 5.3.2.1 Dispensing with a single measuring system**.

7.3.2.3 Dispensing operations with an integrated delivery control system (IDS)

The double calculator function can not be used with an IDS.

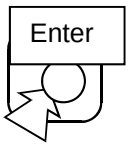
Procedure:

Preparing the dispensing operation

As under 5.3.2 ‘Dispensing’, page 37 et seq, the preparations for the dispensing operation have been completed:

- The corresponding filling hose has been connected.
- The limit indicator has been connected.
- All input values for dispensing have been entered.

```
Customer no.: 1234
€/100l:   060,00        w. VAT
Prod:     1 Fuel Oil
Preset:   001500  l     OK?
```



The cursor will appear in the ‘OK?’ field. Check if all the entries are correct.
If all the values entered are correct, confirm the question ‘OK?’ by pressing ‘enter’.

All the dispensing routes allocated by the calibration parameters will appear on the display.

```
Schlauch wählen:  1: Voll 1
2: Voll    2      3: Bypass  1
4: Bypass  2      5: Leer 1
6: ungem.  1      7: ungem. 2
```

Select the desired dispensing route by entering the corresponding number (1 to 7).
For example, if you wish to dispense from the full hose number 2, press ‘2’.

Displaytest

Once the dispensing route has been selected, the display test will start.

Dispensing

If the display test is successful, the dispensing screen will appear on the display. The magnet valve will open and the system will start dispensing.

Finishing the dispensing operation

Finish the dispensing operation as described in Section '(3) Finishing the dispensing operation', page 43 et seq.

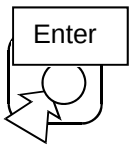
7.3.2.4 Dispensing with the overfill security system LRC

Dispensing with LRC is only possible in connection with IDS!

Preparing the dispensing operation

As under 5.3.2 'Dispensing', page 37 et seq, the preparations for the dispensing operation have been completed:
- The corresponding filling hose has been connected.
- The limit indicator has been connected.
- All input values for dispensing have been entered.

```
Customer no.: 1234
€/100l:   060,00        w. VAT
Prod:     1 Fuel Oil
Preset:   001500    l   OK?
```



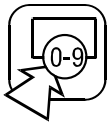
If all the values entered are correct, confirm the question 'OK?' by pressing 'enter'.

All the dispensing routes allocated by the calibration parameters will appear on the display.

```
Schlauch wählen:  1: Voll 1
2: Voll    2      3: Bypass  1
4: Bypass  2      5: Leer 1
6: ungem.  1      7: ungem. 2
```

Place the transmitter onto the limit indicator.

The transmitter is ready when the green LED lights up.



Select the desired dispensing route by entering the corresponding number (1 to 7).

The display shows (only if the ANA-function has been activated):

```
ANA activ:  NO
```

ANA-function

A beep requests the driver to press the ON/ OFF-key on the LRC remote control every 30 seconds. If the driver does not do so, the dispensing operation will be aborted.

Activating the ANA-function

Press the cancel key on the EVM. The display will switch to “YES”.

Press and hold the ON/OFF- and the STOP-key on the remote control at the same time.

Press the confirm key on the EVM and the ANA-function is activated

Start dispensing without ANA

Confirm the display „ANA active: NO“ with the confirm key.

The dispensing operation will be started.

Continue dispensing

Due to movements of the liquid in the tank the dispensing operation might possibly be terminated prior to the intended end by the limit indicator. This might be the case with manifolded tanks.

However, you can continue filling by pressing the ON/ OFF-key on the remote control twice (starting from program version 15!).

Finish dispensing

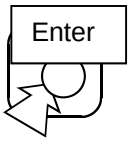
Finish the dispensing operation as described in Section ‘(3) Finishing the dispensing operation’, page 43 et seq.

7.3.2.5 Bypass the overfill security system

Please check with your authorities if you are allowed to bypass the system! Horn-Tecalemit does not take any liability for unauthorized bypassing of the overfill security system.

If there is no limit indicator installed or the LRC shows an error message before dispensing, you can bypass the system.

The display shows:



Press the enter key.

The dispensing operation will be started

Finish dispensing

Finish the dispensing operation as described in Section '(3) Finishing the dispensing operation', page 43 et seq

7.3.3 Start trip/ terminate trip

This function can be used to limit the trip report data to a delivery trip period. You inform the system of the start and end of the trip.

Parameter 161 can be used to define, among other things, whether or not the trip has to be started before the first dispensing operation (for further information see Chapter 6.2.2 Customer parameters).

Program versions 7 and above also enable you to select mixed products that are clearly defined in the system.

Before the start of the trip, the mixed products and their additives must be adjusted to one another. If the additive in the additive pump's storage container is changed or does not correspond to the configured mixed product, the mixed products affected must be newly managed. Further information on blocking and releasing mixed products can be found in Chapter 5.3.5.7 Manage additional products, Section (1.3) Additive pump.

Start trip

You use this function to inform the system of the start of the trip. The system will save all dispensing and time data until you execute the 'terminate trip' function.

Density entry

If legal regulations allow the density of the dispensing products to be entered, this function is activated during calibration and the daily densities can be edited at the start of the trip (**not permitted in Germany**) (see procedural description). In the main menu, function 2 appears as 'Start trip, density/densities'.

Procedure:
The system is in the starting position:

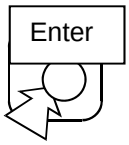
```
1: Filling
2: Start trip, Density
3: Statistics
4: Service
```

Enter ‘2’.

```
Please enter driver
or master code:
      _
```

Parameter 201 stipulates whether or not a code (driver or master code number) must be entered to start the trip.

If requested, enter the four digit code.

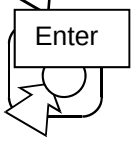


Confirm the code by pressing ‘enter’.

```
Driver number:
      _
```

On starting the trip, **parameter 157** can also be used to request the entry of a driver number (see **Chapter 6.2.2 Customer parameters, Section (1) Operating parameters**).

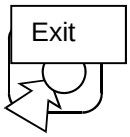
Enter the driver number.



Confirm the driver number by pressing ‘enter’.

If the ‘enter density’ function was activated during system calibration, the display will now automatically show the first dispensing product with the preset density values:

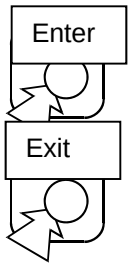
```
Product 1 Fuel Oil

Density – 0845,0 kg/m³
```



If the cursor appears by the product in the first line, the enter density function can be terminated by pressing ‘exit’. Therefore, if you do not want to change any of the density values, press ‘cancel’ now.

Changing density values

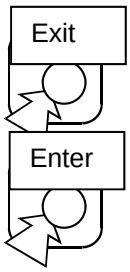
Alternatively, if you need to change a density value



press ‘enter’.
The cursor will jump to the density entry field in the fourth line.
Press ‘exit’. The preset value will be deleted.

Enter the new density value, for example ‘08440’.

```
Product   1     Fuel Oil

Density – 0844,0 kg/m³
```



If you wish to cancel an amendment which you have made, press the ‘exit’ button now.

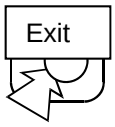
Alternatively, press ‘enter’ if the density values should still be used. ‘Confirm’ must also be pressed if you wish to retain the preset value as it is.

The cursor will now return to the first line. The display shows the next dispensing product and its density:

```
Product   2     Diesel

Density – 0845,0 kg/m³
```

Repeat the above procedure for all dispensing products for which you need to change the density.

Terminate density entry



The cursor has moved to the first line. You can terminate the 'enter density' function before it has completed by pressing 'exit'.
The function will be automatically terminated when you confirm the value of the final dispensing product stored in the system.
Once the trip starts successfully, the display will show the message 'trip has started'. This message will disappear automatically after three seconds.

```
1: Filling
2: Start trip
3: Statistics
4: Service
```

The system will return to the main menu. Menu point 2 will now appear as 'Terminate trip'.

(2) Terminate trip

This function informs the system of the end of the trip. The data recording for the current trip report is completed.

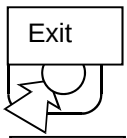
Procedure:

The system displays the main menu. The display shows:

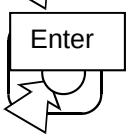
```
1: Filling
2: Start trip
3: Statistics
4: Service
```

Enter '2'.

```
Terminate trip

Confirm: yes
Cancel: no
```



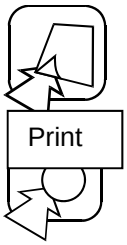
To return to the main menu, press 'exit'.



If you wish to terminate the trip, press 'enter'.

```
Print trip report !!!
```

If the setting **parameter 161** = 3 is activated in your system (obligatory trip start), you can only start the next trip after the trip report has been printed.



Insert the appropriate paper for the trip report into the printer.

Press ‘print’ to start printing the trip report.

The message ‘trip has finished’ appears on the display. This message will disappear automatically after three seconds. In the main menu, menu item 2 will revert to ‘Begin trip’.

```
1: Filling
2: Start trip
3: Statistics
4: Service
```

Once the printout is complete, remove the trip report from the printer.

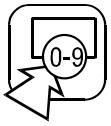
7.3.4 Statistics

The integrated system statistics enable you to follow all the tank truck’s delivery procedures.
Three forms of statistics are at your disposal:

- Trip report
- Totalizer
- Last filling data

Procedure:
The system is in the starting position:

```
1: Filling
2: Start trip
3: Statistics
4: Service
```



Enter ‘3’.

```
Please enter driver
or master code
      _
```

Parameter 202 stipulates whether or not the statistics are access protected and a code number (driver or master code) must be entered.

Enter the four digit code. Confirm your entry by pressing 'confirm'.

```
1: Trip report
2: Totalizer
3: Last filling data
```

The system will now display the statistics sub-menu. Start the desired statistics.

7.3.4.1 Trip report

Statistics function 1

The dispensing data from a delivery trip are compiled in a trip report.

The current and last trip reports can be printed.
The EVM saves the data of up to 100 dispensing operations for each of these reports.

You can use **parameter 161** to determine whether and when the trip report has to be printed. A full description can be found in **Chapter 6.2.2 Customer parameters, Section (1) Operating parameters**.

Paper format

The appropriate paper format for printing the trip report is paper size DIN A4.

Procedure:

Insert the appropriate paper into the printer.

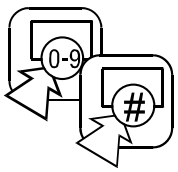
The system will display the statistics sub-menu. The display shows:

1: Trip report
2: Totalizer
3: Last filling data

Enter ‘1’.

1: Current report
23.05.07 07:30 – 12:32
2: Last report
22.05.07 08:07 – 15:35

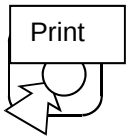
The cursor has moved to ‘1: Current report’ in the first line. If you want to print the last report, there are two methods of selecting this option:



Enter ‘2’.

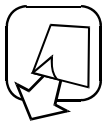
Or press ‘#’ to move to menu item ‘2: Last report’.

Press ‘*’ to return to menu item ‘1: Current report’.

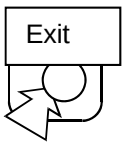


Press ‘print’.

The EVM now prepares the data for the selected trip report and starts printing. While printing, the message ‘printing’ appears on the display.



Once the printout is complete, remove the trip report from the printer.
If there is insufficient space on the paper, insert a second sheet. Printing will automatically continue.



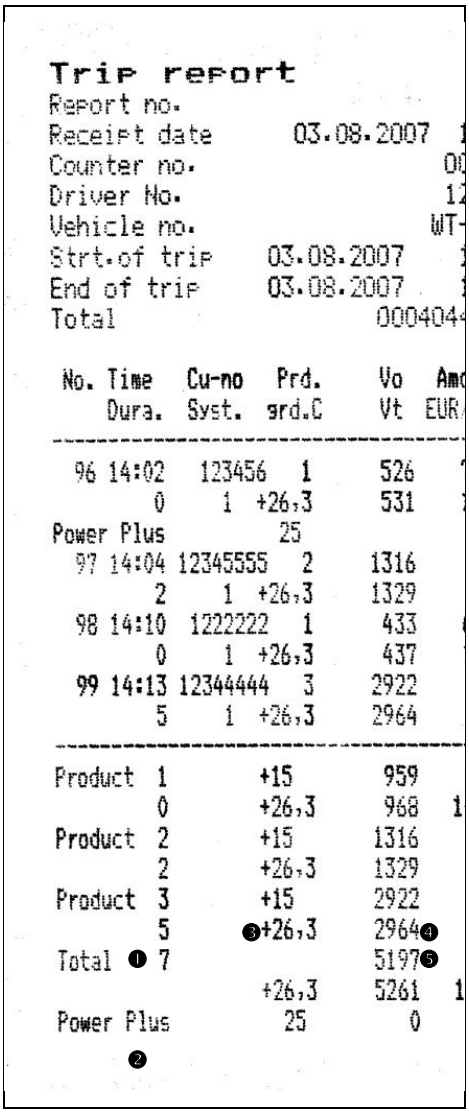
If you do not need any further statistics, press ‘exit’ to leave sub-menu ‘3: Statistics’ and return to the main menu.

The figure on the next page shows the an example of a trip report layout.

The parameter-dependent trip report data are:

- Driver number (**parameter 157**)
- Customer number (**parameter 156**)
- Total amount in EUR/100l (**parameter 150**).

This data can only be provided on this data trip report when it is available in the system. If for example, you have made a delivery without a price calculator, there is no total amount available in the system for this dispensing operation and no total amount appears on the trip report.



Trip report
Report no.
Receipt date 03.08.2007
Counter no.
Driver No.
Vehicle no.
Strt.of trip 03.08.2007
End of trip 03.08.2007
Total

No. Time Dura.	Cu-no Syst.	Prd. grd.C	Vo Vt	Amo EUR
96 14:02	123456	1	526	
0	1	+26,3	531	
Power Plus		25		
97 14:04	12345555	2	1316	
2	1	+26,3	1329	
98 14:10	1222222	1	433	
0	1	+26,3	437	
99 14:13	12344444	3	2922	
5	1	+26,3	2964	
Product 1		+15	959	
0		+26,3	968	1
Product 2		+15	1316	
2		+26,3	1329	
Product 3		+15	2922	
5		❸+26,3	2964❹	
Total ❶ 7			5197❺	
		+26,3	5261	1
Power Plus		25	0	
❷				

Field/column	Field/column Description
Report no.	Accumulative trip report number
Receipt date	Date and time of the report printout
Meter number A*)	Meter number of measuring point A (addition 'A'

Field/column	Field/column Description
	only for dual measuring systems)
Meter number B*)	Meter number of measuring point B (measuring point 'B' only for dual measuring systems)
Measuring point number A*)	Measuring point number of measuring point A (measuring point 'A' only for dual measuring systems)
Measuring point number B*)	Measuring point number of measuring point B (measuring point 'B' only for dual measuring systems)
Driver number	Entered at start of trip (entry option dependent on **parameter 157**).
Vehicle number*)	For example: vehicle registration
Total amount	Overall totalizer (sum of the individual product totalizers)
No. **)	Accumulative number of the dispensing operation or additional product name
Time	Start of the dispensing operation
Duration	Duration of the dispensing operation in minutes
Cust. no.	Customer number (entry options dependent on **parameter 156**)
Measur. pt.	Measuring point number of the measuring point used for this dispensing operation (only for dual measuring systems)
Pr.	Product number of the dispensing product or additional product number of additional products
Grd.C	Average dispensing temperature
Vo	Compensated volume (only for products with TVC)
Vt	Volume at operating temperature (= uncompensated volume) or sales volume of additional products
T-amount	Total amount of the dispensing operation with VAT
Price/100l	Basic price of the dispensing operation with VAT
❶ Duration	Time in minutes to dispense product 1
❷	Total time in minutes of all dispensing operations
❸ Grd.C	Mean average temperature when dispensing product 1, weighted on the basis of volume
❹ T-amount	Sum of the total amounts of product 1

❺ EUR/100l — Average basic price per 100l dispensed of product 1, weighted on the basis of volume.

*) Setting made during system configuration

**) This accumulative number is provided when starting the dispensing operation; the order in which the dispensing operations appear on the trip report when using a dual measuring system depends on when the dispensing operation finished.

If during a trip dispensing operations are carried out using mixed products (main product mixed with an additive), the additive volume is printed out for each of the individual dispensing operations using this product, and the additive name and total amount of the additive are printed in the product-related totals. A full description of this procedure can be found in **Chapter 5.3.5.7 Manage additional products**.

7.3.4.2 Totalizer

Statistics function 2

These statistics can be used to view and print the totalizer's current status

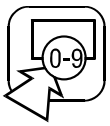
- Per product and
- As a total amount of all products.

When using program version 7 and above with a double calculator, in addition to the display and printout in previous versions, the total amounts for measuring points A and B are also displayed and printed separately.

Procedure:

The system displays the statistics sub-menu. The display shows:

```
1: Trip report
2: Totalizer
3: Last filling data
```



Enter ‘2’.

The following selection appears on the display:

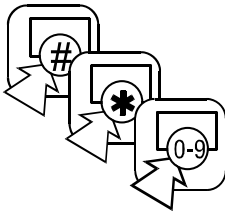
```
1: Product totals
2: All totals
3: Print totals
```

(1) Show product totals

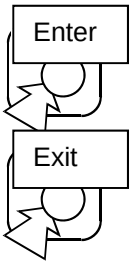
Procedure:

Enter ‘1’.

```
All totals          1

compensated  000024825 L
uncompensated      000024876 L
```



Press ‘#’ to display a list of the totalizer readings for all products which are recorded in the system.
If desired, press ‘*’ to return to the previous reading.
You can also directly select the record for a particular product by entering the corresponding product number.



To accept the direct selection by entering the product number, press ‘enter’.

To return to the ‘Totalizer’ menu, press ‘cancel’ once. To return to the ‘Statistics’ menu, press ‘cancel’ twice. To return to the main menu, press ‘exit’ three times.

Show totals

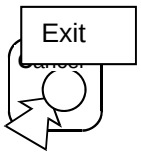
Procedure:

```
1: Product totals
2: All totals
3: Print totals
```

Enter ‘2’.

Single measuring system

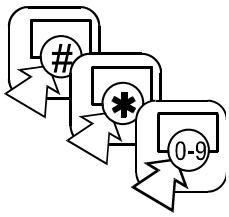
```
All totals

compensated  000024825 L
uncompensated      000024876 L
```



To return to menu ‘2: Totalizer’, press ‘exit’ once. Return to the main menu as described above.

Dual measuring system

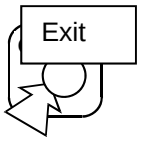
```
All totals

compensated  000151942 L
uncompensated      000152456 L
```



Press ‘confirm’, ‘*’ or ‘#’ to move on a step.

```
All totals   1

compensated  000082924 L
uncompensated      000083262 L
```

```
All totals   2

compensated  000069018 L
uncompensated      000069194 L
```



To return to menu ‘2: Totalizer’, press ‘exit’ once. Return to the main menu as described above.

Print all totalizer readings

There is a joint printout option for the totalizer readings for all products stored in the system. The data provided shows the compensated volume (Vc) and the volume at operating temperature (Vt).

Paper format

DIN A5 paper should be used for this printout.

Procedure:

Insert the paper into the printer.

The system displays the totalizer sub-menu:

```
1: Product totals
2: All totals
3: Print totals
```

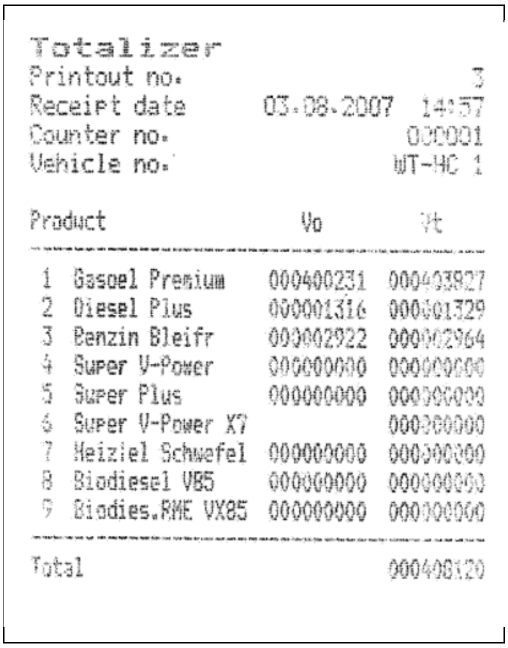
Enter ‘3’.

While the print-task is running, the message ‘printing’ will appear on the display. When printing has finished, the totalizer sub-menu will reappear.

Press ‘exit’ to exit the totalizer menu.

Once printing has finished, remove the printout from the printer.

The following figure shows an example printout of the totalizer readings:



Totalizer

Printout no. 3

Receipt date 03.08.2007 14:57

Counter no. 000001

Vehicle no. WT-HC 1

	Product	Vo	Vt
1	Gasoel Premium	000400231	000403827
2	Diesel Plus	000001316	000001329
3	Benzin Bleifr	000002922	000002964
4	Super V-Power	000000000	000000000
5	Super Plus	000000000	000000000
6	Super V-Power X7		000000000
7	Heiziel Schwefel	000000000	000000000
8	Biodiesel VB5	000000000	000000000
9	Biodies.RME VX85	000000000	000000000
	Total		000408120

Depending on the setting chosen during system calibration, the printout will show the meter number, the measuring point number or both numbers.

The differentiation between ‘A’ and ‘B’ only occurs when using the dual measuring system. When the dual measuring system is used, the total amounts for measuring points ‘A’ and ‘B’ are shown separately on the printout.

7.3.4.3 Last filling data

Statistics function 3

This function can be used to

- Print a delivery receipt retrospectively or
- Create an additional receipt.
  The word ‘copy’ will automatically appear on the second and every subsequent printout.

The printout will also display the note ‘modif. copy’ if:

- A different receipt type is used for the additional printout to that used for the original printout
- The receipt parameters have been edited since the dispensing operation (even if the original parameter settings have been re-established).

Procedure:

The procedure for printing a receipt is the same as the procedure used at the end of a dispensing operation.

First, insert the appropriate paper into the printer.

The system will display the statistics menu. The display shows:

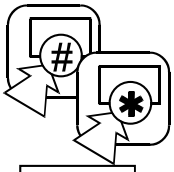
```
1: Trip report
2: Totalizer
3: Last filling data
```

Enter ‘3’.

```
Mem. position: 0
Receipt number:    0125
Volume:         001357 L
```

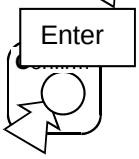
The display will initially show the data from the last dispensing operation. This is recording position 0 in the EVM. The recording position is a declining number for completed dispensing operations. If you require a receipt for a previous dispensing operation, you have two options:

You can select the appropriate receipt directly by entering the recording position as a number (without a minus sign). For example, to access the dispensing operation before last, enter '1'.

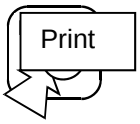


Press '*' to move back one dispensing operation at a time.

Press '#' to move forwards one dispensing operation at a time.



Once the desired receipt appears on the display, press 'enter'.



Press 'print'.

Once printing has finished, remove the print-out from the printer.

Press 'exit' to return to menu '3: Statistics'.

7.3.5 Service functions

The system's service functions are:

- Edit receipt parameters
- Edit customer parameters
- Load parameters into module
- Load parameters into TWM
- Display and set date and time
- Display temperature
- Manage additional products (configure mixed products)
- View or create product names*)
- Edit calibration parameters*)
- Calibration*)

The service functions are not required for normal operation. To prevent system failures, these functions should only be activated when required.

The final three service functions are solely for calibration purposes. They can only be activated in connection with the sealed calibration switch.

Procedure:

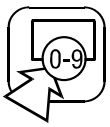
In the starting position, the display shows the main menu:

```
1: Filling
2: Start trip
3: Statistics
4: Service
```

Enter ‘4’.

```
Please enter driver
or master code
      _
```

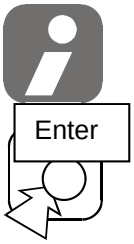
Access authorisation to the service functions can be limited using **parameter 203**.



If requested by the system, enter the four digit code (driver or master code).

Forgotten code number

If you have forgotten the code and are therefore unable to access the service functions, please contact your service workshop/truck body manufacturer for further assistance.

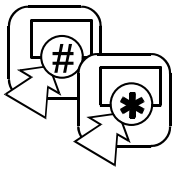


Confirm the code by pressing ‘enter’.

```
1: Receipt parameters
2: Customer parameters
3: Load into module
4: Load into TWM
```

The display initially shows the first four service functions.

7: Add. products
8: Product names
9: Calibration parameters
0: Calibration



Press '#' to move the menu on a step until the display shows service functions 7 to 0.

Press '*' to go back a step.

5: Date and Time
6: Test Temperature
7: Add. Products
8: Product names

The service functions can be selected by entering the corresponding function numbers (1 – 9 and 0).

7.3.5.1 Edit receipt parameters

Service function 1

This service function is used to manage the delivery receipt parameters. The TWM 2084 enables the use of three (3) different receipt types for the delivery receipt.

The following functions can be used to manage the receipt parameters:

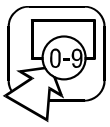
- View/ modify parameters
- Load parameters into module
- Load parameters into TWM

A list of the definable values for individual receipt parameters can be found in **Chapter 6.2.1 Receipt parameters**.

Procedure:

The system displays sub-menu '4: Service':

1: Receipt parameters
2: Customer parameters
3: Load into module
3: Load into TWM



Enter ‘1’.

The system now displays the receipt parameters sub-menu:

```
Receipt parameters
1: View/ Modify
2: Print list
3: Load basic values
```

View/ modify parameters

This function is used to view or modify the current parameter values.

Procedure:

The system displays the receipt parameters menu:

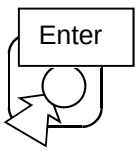
```
Receipt parameters
1: View/ Modify
2: Print list
3: Load basic values
```

Enter ‘1’.

```
Receiptpar. for
rec type: 1
(Confirm or change
 between 1 and 3)
```

Define the receipt type for which you would like to edit the parameter settings. The system starts by offering receipt type 1. If you would like to edit a different receipt type, enter the corresponding number:

- ‘2’ = receipt type 2
- ‘3’ = receipt type 3



After selecting the receipt type, press ‘enter’.

```
Par. no.:   001  R1
Value:           000

Min/max: 000/002
```

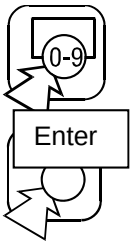
The display will automatically show the most recently modified parameters for this receipt type. The parameter number appears in the first line. The current parameter value appears in the second line. The letter and number in the right-hand side of the display indicate the parameter of the receipt type that you are editing:

- 'R1' = receipt parameter receipt type 1
- 'R2' = receipt parameter receipt type 2
- 'R3' = receipt parameter receipt type 3

The final line shows the minimum and maximum values which can be entered for this parameter.

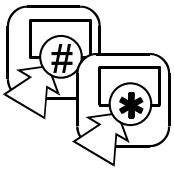
Selecting a parameter

Now select the parameter for which the parameter value should be viewed/modified using one of the two following methods:



Either, enter the corresponding parameter number directly.

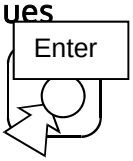
After pressing 'enter', the current value of this parameter will be displayed.



Or press '#' to move from one parameter to the next.
Press '*' to go back a step.

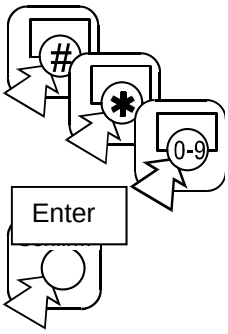
Modifying parameter values

The parameter for which the value should be modified appears on the display.



Press 'enter'.
The cursor jumps to the second line. Now modify the parameter value.

You have two options when setting the new parameter value:



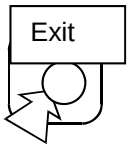
Use the ten-key keypad to enter the new value.

Or press '#' or '*' to move to the desired value.

Press 'enter' to save the displayed parameter value in the system.

Cancel modification

Press 'cancel' to exit the parameter value entry line.



The cursor returns to the first line. Select the next parameter.

```
Par. no:   003  R1
Value:          000
Customer number
Min/max:
```

Repeat this procedure until you have set all the desired parameters

Terminating the function

Press ‘exit’ to terminate the function. The system will return to the receipt parameters menu.

(2) Print parameter list

This function provides you with a list of the current parameter values of all three receipt types.

Paper format Use DIN A4 paper for this print-out.

Procedure:

Insert the paper into the printer.

The system displays the receipt parameters sub-menu:

```
Receipt parameters
1: View/ Modify
2: Print list
3: Load basic values
```

Enter ‘2’.

The EVM prepares the parameter list for the print task and begins the printing process. While printing, a corresponding message appears on the display. After printing, the system returns to the receipt parameters sub-menu.
To return to the main menu, press ‘exit’.

The following figure shows the layout of a receipt parameter list on an example printout.

Receipt parameters
Counter no. 000001
Program version 2084.75.100.16
Vehicle no. WT-HC 1
Receipt date 29.01.2008 21:55

Receipt	-1---2---3-
001: Receipt type header	002 000 000
002: Invoice number	001 000 000
003: Customer number	001 000 000
004: Zero print	001 000 000
005: Start of filling	001 001 001
006: End of filling	001 001 001
007: Total	001 000 000
008: Driver number	001 000 000
009: Vehicle number	001 000 000
010: date	001 001 001
011: Add. product, ratio	002 001 001
012: Preset-value	000 000 000
013: Average temperature	001 000 000
015: Amount	001 000 000
016: Basic price	001 000 000
017: Net price	001 000 000
018: VAT amount	001 000 000
019: Uncompensated Volume	001 001 001
021: Dashed line after block 1	001 000 000
022: Dashed line after block 2	001 000 000
023: Dashed line after block 3	001 001 001
024: Dashed line after block 4	001 000 000
025: Blank lines after header	005 000 000
026: Paper eject after print.	001 001 001
027: Blank lines before header	002 000 000
028: Blank lines bef.count.no.	001 000 000
029: Blank lines bef. block 4	001 000 000
030: Blank lines bef. block 5	002 000 000
031: Blank lines bef. block 6	001 000 000
032: Blank lines after block 6	002 000 000
033: Left margin	000 000 000
034:	001 000 000

Depending on the setting chosen during system calibration of the TWM 2084, the meter number, the measuring point number or both numbers will appear on the print-out.

The differentiation between ‘A’ and ‘B’ only occurs when using the dual measuring system.

(3) **Load basic values**

This function allocates the basic values to the receipt parameters. The basic values ('def' values column) of the individual parameters can be found in **Chapter 6.2.1 Receipt parameters**.

Function '**3: Load basic values**' is used to overwrite all the receipt parameter values stored in the system with the basic values. All three receipt types have the same basic values.

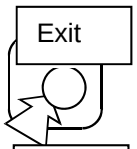
Procedure:

The system displays the receipt parameters sub-menu:

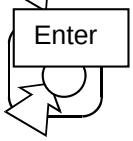
```
Receipt parameters
1: View/ Modify
2: Print list
3: Load basic values
```

Enter '3'.

```
Load basic values?

Confirm:  yes
Cancel:   no
```



By pressing 'exit' you are still able to cancel the procedure.



If you wish to overwrite the parameter values with the basic values, press 'enter'.

Once the basic values have been loaded, the system automatically returns to the receipt parameters menu.

7.3.5.2 Edit customer parameters

Service function 2

You can use this service function to manage the customer parameters. A list with an exact description of all the definable customer parameters can be found in **Chapter 6.2.2 Customer parameters**.

Procedure:
The system displays menu ‘4: Service’

```
1:Belegparameter
2:Kundenparameter
3:Parameter ins Modul laden
4:Parameter in TWM laden
```

Enter ‘2’.

The system now displays the customer parameters sub-menu:

```
Customer parameters:
1: View/ Modify
2: Print list
3: Load basic values
```

The procedures for using functions 1 to 3 in the customer parameters sub-menu are the same as those for processing the receipt parameters. You can therefore follow the procedural descriptions already provided in **Chapter 5.3.5.1 Edit receipt parameters**.

Function ‘**3: Load basic values**’ is used to overwrite all the customer parameter values stored in the system with the basic values.

The customer parameter basic values can be found in the ‘def.’ value column of the parameter lists in **Chapter 6.2.2 Customer para-meters**.

The following figure shows an example printout for a customer parameter list, which you can print using function ‘2: Print’ of the customer parameters sub-menu.

```
Coustomer parameters
Counter no.                    000001
Program version   2084.75.100.16
Vehicle no.                    WT-HC 1
Receipt date      29.01.2008   21:57

150: Price calculator function          001
151: Basic price without/with VAT       000
152: Time interval(flow rate meas.)     002
153: Contrast of display                017
154: Keystroke sensitivity              000
155: Dialogue language (english)        003
156: Customer number                    008
157: Driver number                      006
158: Paper feed function                001
159: EVM switched off autom. (Min.)     000
160: Release of control switch          000
161: Trip start/trip report             000
162: Preset: off/volume/amount          003
163: Display of flow rate               001
164: Display of product temperature     002
165: Select receipt language            099
166: Select receipt type                001
167: Max. volume dispensed            00000
169:                                    000
170:                                    000
171: vehicle number                 WT-HC 1
183: Dual-measuring system              000
184: Variant                            000
185: Continue filling (min)             000
191: Driver code                      00000
193: Master code                      00000
199: Access to function: service 2      000
200: Access to function: filling        000
201: Access to function: start trip     000
202: Access to function: statistics     000
203: Access to function: service        000
204: VAT rate 0                       00200
206: VAT rate 1                       00190
208: VAT rate 2                       00075
210: Allocation for products 1 - 3      111
211: Allocation for products 4 - 6      111
212: Allocation for products 7 - 9      111
213: Allocation for add. products       111
215:                                    000
220: DIN 66348 address A                000
221: DIN 66348 address B                000
243: EURO (currency)                    002
244: EURO (rate of exchange)      1,987655
```

7.3.5.3 Load parameters into module

Service function 3

This function saves the current parameter values of the customer, receipt and calibration parameters to a single parameter module.
It does not copy the data on the additional products or the product names; this data has to be saved onto a separate parameter module (see **Chapter 5.3.5.7 Manage additional products** and **Chapter 5.3.5.8 View or create product names**).

Procedure:

Firstly, insert the parameter module:

Danger of explosion! Explosion-proof systems must be switched off using the main TWM switch **at least 15 minutes** before the front panel on the EVM is opened.

Explosion-proof version:

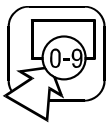
- Undo the 12 Allen screws on the front panel.
- Fold the front panel away to the side.

Non-explosion-proof version:

- Undo the 4 cross-head screws on the front panel.
- Remove the front panel from the housing and hang it from the plate intended for this purpose on the base of the housing. Ensure that you do not clamp the cable connection between the facing and the housing too tightly.

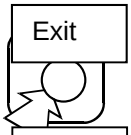
Insert the parameter module lengthwise with the contacts facing forwards into the intended opening within the EVM. The module can be inserted in either direction as it constructed as a double-sided module.
You can now select the function. The system already displays sub-menu '4: Service':

```
1: Receipt parameters
2: Customer parameters
3: Load into module
4: Load into TWM
```

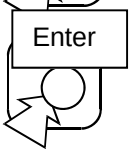


Enter ‘3’.

```
Load parameters into module?
Confirm:  yes
Cancel:   no
```

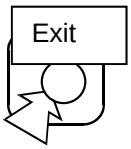


By pressing ‘exit’, you are still able to terminate the function without saving the parameters to the module.



Alternatively, press ‘enter’ to save the parameters.

Once the saving operation has been successfully concluded, the system displays the message ‘function complete’ and returns to the service menu.



To return to the main menu, press ‘exit’.

Remove the parameter module.

Use the appropriate screws to fasten the EVM front panel back on

```
Mod. missing/ defect
```

If this message appears, check whether the module has been correctly inserted and the contacts are clean and free of grease. If this is the case but the function still does not work, please contact your truck body manufacturer or our customer service.

7.3.5.4 Load parameters into TWM

Service-function 4

You can use this function to load the parameter settings saved on the parameter module back into the system.
When using this function in normal mode, the calibration parameter data and product names will not be copied as these are linked to the sealed calibration switch.

When service function ‘4: Load parameters in TWM’ is used, all the parameter values defined in the system for the receipt and customer parameters are overwritten with the parameter values on the module.

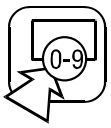
Procedure:

See **Chapter 5.3.5.3 Load parameters into module** for how to insert the parameter module.

Danger of explosion! Explosion-proof systems must be switched off using the main TWM switch **at least 15 minutes** before the front panel on the EVM is opened.

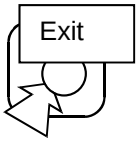
The parameter module has been inserted and the system displays the service menu:

```
Mod. missing/ defect
```

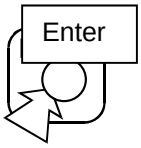


Enter ‘4’.

```
Load parameters into TWM?
Confirm:  yes
Cancel:   no
```

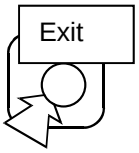


By pressing ‘exit’ you can still terminate this function without overwriting the parameter values in the system with the parameter values in the module.



If you wish to transfer the parameter values from the module to the system, press ‘enter’.

Once the transfer has been completed, the system will return to the service menu.



To return to the main menu, press ‘exit’.

```
Mod. missing/ defect
```

If this message appears, recheck whether the module has been correctly inserted and the contacts are clean and free of grease. If this is the case but the function still does not work, please contact your truck body manufacturer or our customer service.

7.3.5.5 Date and time

Service-function 5

This function displays the current date and time. If necessary, you can correct the date and time, for example when changing from summer to winter time or vice-versa.

Procedure:

The system displays the service menu:

```
5: Date and Time
6: Test Temperature
7: Add. products
8: Product names
```

Enter '5'.

```
Date:      26.06.2007
Time:      13:26:16
1: New date
2: New time
```

If the date and time are correct, press 'cancel'. The systems returns to the service functions menu level.

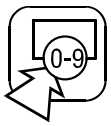
(1) New date

The TWM 2084 has an internal calendar which even takes leap-years into account. This means that you will not usually need to set the date. If this is necessary at some point however, follow the procedure below.

Procedure:

The system already displays the date/time sub-menu:

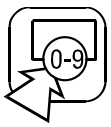
```
Date:      26.06.2007
Time:      13:26:16
1: New date
2: New time
```

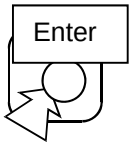


Enter `1`

```
Enter Time:
      14:35
```

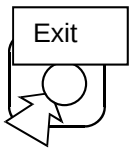
The cursor will automatically appear on the left in the entry field for the day, e.g. in the example above, under '26'.
If you wish to change the current setting, use the ten-key keypad to enter the new day.





Confirm the day by pressing 'enter'. You must press 'confirm' even if you do not want to make any changes to the information already displayed.
The cursor will move on to the next entry position, 'month'.
By following this procedure, you can correct the set values in the order:

- Day
- Month
- Year (Two or four digit entry; display always four digit).



After confirming the year, press 'exit' to return to sub-menu '5: Date/time'. The new data is saved in the system.

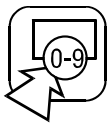
(2) New time

Use this function to change the EVM's internal clock from summer to winter time and vice-versa.

Procedure:

The system already displays the date/ time service function:

```
Date:          01.08.2007
Time:          14:35:56
1: New date
2: New time
```

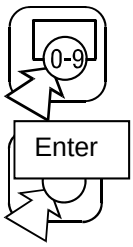


Enter `2`

```
Enter Time:
      14:35
```

Hour

The cursor will automatically appear on the left in the entry field for the hour, e.g. in the example above, under '14'.

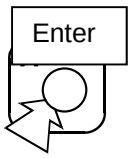


Overwrite the hour setting displayed.

Confirm the hour by pressing 'enter'.
You must press 'confirm' even if you do not want to make any changes to the information displayed.
The cursor will move on to the next entry position, 'minutes'.

Minutes

Set the minutes to the appropriate time.



After confirming the minutes setting, press 'enter' to return to sub-menu '5: Date/time'. The new time is saved in the system.

7.3.5.6 Display temperature

Service function 6

This function displays the temperature measured by the temperature sensor at the time

Procedure:

The system displays the service menu:

```
5: Date and Time
6: Test Temperature
7: Add. products
8: Product name
```

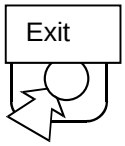
Enter `6`

Single Measuring system

```
Temperature:
      A:    18,3°C
```

Dual measuring systems

If a dual measuring system is used, the temperatures of both measuring points A and B are displayed:



Press ‘exit’ to exit the display.

7.3.5.7 Manage additional products

Service function 7

Use this service function to manage additional products such as additives in the system.

Programs version 6 and above differentiate between:

- Additional products which are selected as extras (as previously) after the dispensing operation has terminated and appear on the dispensing operation delivery receipt with a price, volume and amount and
- Additional products which are dispensed as an admixture (additive) during the dispensing operation using an additive pump in a predefined mixing ratio for the dispensing product. In addition to the dispensing volume, the additive name and the mixing ratio also appear on the receipt.

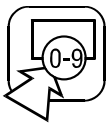
The following functions can be used to manage the additional products:

- View/modify additional products
- Load additional products into module
- Load additional products into TWM

Procedure:

The system displays sub-menu ‘4: Service’:

```
5: Date and Time
6: Test Temperature
7: Add. products
8: Product name
```



Enter `7`

The additional products sub-menu now appears on the display:

```
Additional products
1: View/ Modify
2: Load into module
3: Load into TWM
```

(1) View/ modify additional products

Up to 15 additional products can be stored in the system. With this function, the additional product data can be:

- Manually created
- Displayed
- Allocated to a dispensing product as an admixture
- Amended if necessary.

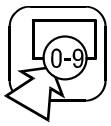
The overall view/modify additional products service function is divided into the following sub-functions:

- Additional products
- Unit name
- Additive pump

Procedure:

The system already displays sub-menu ‘7: Additional products’:

```
Additional products
1: View/ Modify
2: Load into module
3: Load into TWM
```



Enter ‘1’. The following sub-menu is displayed:

```
Add. Products (view/modify)
1: Additional products
2: Unit
3: Additive pump
```

You can now choose one of the following functions:

- Additional products (to create additional products)
- Unit name (to establish the quantity units)
- Additive pump (to allocate an additional product as an admixture to a dispensing product)

(1.1) Additional products

Use this sub-function to create the additional product’s number, name, basic price, quantity unit and quantity entry format.

Procedure:

The system already displays the ‘View/modify additional products’ sub-menu:

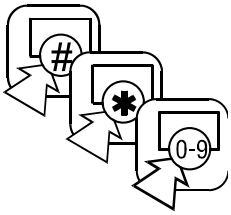
```
Add. Products (view/modify)
1: Additional products
2: Unit
3: Additive pump
```

Enter `1`

```
20: P20
000,00 €/l  w/o VAT

Vol. w/o dec. point
```

Selecting an additional product number

The cursor appears under the additional product number on the left of the first line. The additional product numbers are set in the system and range from 20 to 34.



Press '#' to move on to the next number.

Press '*' to go back a number.

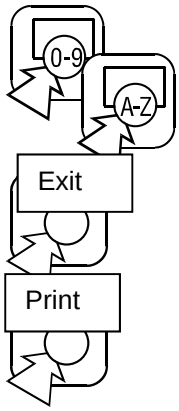
You can also select any of the additional product numbers directly by entering the corresponding number and pressing 'confirm'.

Confirm your selected additional product number by pressing 'confirm'.
The cursor will move to the right-hand field for entering the additional product name.

```
20: P20
000,00 €/l  w/o VAT

Vol. w/o dec. point
```

Entering an additional product name

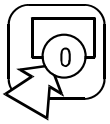
The product names can be user-defined and contain up to 15 characters (letters and numbers). The inverted commas on the left and right-hand sides of the display demarcate the entry area.
A full description of the TWM 2084's keypad layout for entering the names can be found in a table in **Chapter 9.3 Keypad layout and font**.
Use the ten-key keypad to select the desired character to be entered for the name.
Each of keys 1 to 9 has three letters which are displayed on the left of the key above the number. For example, key '1' can be used to enter the letters a, b and c and the number 1.
Press the key with the desired letters repeatedly until the correct letter appears on the display. The fourth time you press the key, the corresponding key number will appear.



If the letter displayed should be written in upper case, press 'Exit' after selecting the letter.

If you require umlauts on the letters a, o and u (i.e. ä, ö and ü), press 'print' immediately after selecting the letter.

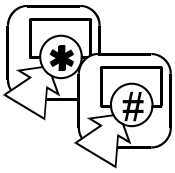
To move on to the next entry position press '#'.



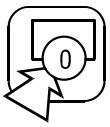
To enter a space between two letters press '0'.

Deleting a character

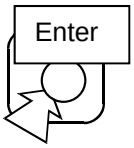
If you wish to delete a character you must first position to cursor under the character which should be deleted:



Press '*' to move the cursor back a place;
Press '#' to move the cursor on a place.



When the cursor is under the character which should be deleted, press '0' again.

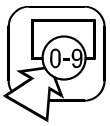


Confirm the product name by pressing 'enter'.

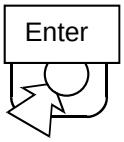
```
20: Add1
000,00 €/l        w/o VAT

Vol. w/o dec. point
```

Entering the basic price

The basic price without VAT can be entered in the second line. This basic price refers to a quantity unit (e.g. 1 litre, 1 item etc.) for this additional product.



When entering the price you must enter the three digits before the point and the two digits after the point.
Example: the basic price for the additional product just created 'Add 1' is to be 60.00 EUR (per 1 litre). You would therefore enter '06000'. The point will be added automatically.



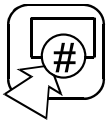
Confirm the basic price entry by pressing 'enter'.

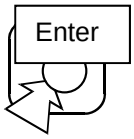
```
20: Add1
000,00 €/l        w/o VAT

Vol. w/o dec. point
```

Selecting the quantity unit

The cursor appears under the quantity unit in the same line as above. The system expects you to enter the quantity unit for this additional product. The following basic units are provided by the system:

1 = L (Short for litre(s))
2 = Litre(s)
3 = Item(s)
4 = Itm(s). (Short for Item(s))
5 = Kg(s) (Short for kilogram(s))
Press '#' to move from one basic unit to the next.





After selecting the desired basic unit, press ‘enter’. The cursor now moves to the fourth line.

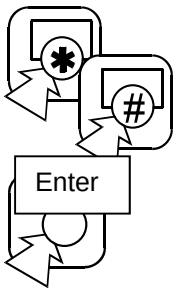
If the list of preset basic units does not meet your needs, you can also enter names for the preset basic units. For a full description of this procedure, please see **Section (1.2) Unit name** below.

```
20: Add1
060,00 €/l        w/o VAT

Vol. w/o dec. point
```

Setting the quantity entry format

The fourth line must be used to specify how the sales quantity of this additional product is to be entered:

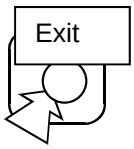
- ‘with comma’ = quantities of less than 1 unit can be entered, e.g. 1/10 litre
- ‘without comma’ = only entire quantity units can be entered, e.g. entire litres.
-



Press ‘*’ or ‘#’ to switch between these two options.

After selecting the desired entry format for the sales quantity, press ‘enter’.
By confirming this final option, the additional product is stored in the system.

The cursor now returns to the first line. The above procedure can be repeated to store up to 15 additional products in the system.



To terminate the sub-function and return to the ‘View/modify additional products’ sub-menu after making all your entries, press ‘exit’.

(1.2) Unit name

Use this sub-function to overwrite or reset preset basic unit quantity units.
If the list of preset basic units does not meet your needs, enter your own names for the units. You can enter up to 5 basic units.
The following basic units are provided by the system:
1 = L (Short for litre(s))
2 = Litre(s)
3 = Item(s)
4 = Itm(s). (Short for Item(s))
5 = Kg(s) (Short for kilogram(s))

If a preset unit name is modified, this modification will apply to all additional products with this basic unit (reference number).

Procedure:

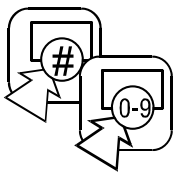
The system displays the 'View/modify additional products' sub-menu:

```
Add. Products (view/modify)
1: Additional products
2: Unit
3: Additive pump
```

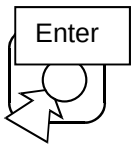
Enter '2'.

```
Unit no.:  1
Name:
```

The cursor now appears in the second line under the basic unit's reference number.
Press '#' to move from one basic unit to the next.
Alternatively, select one of the basic units directly by entering the corresponding basic unit reference number (1 to 5).



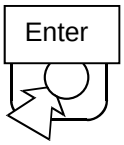
Setting the quantity unit



Press 'enter'. After selecting the desired reference number, the cursor moves to the name/abbreviation for the selected basic unit in the third line.

You can now modify the name provided by the system by overwriting it. The rules for entering the unit names are the same as those for entering product names.

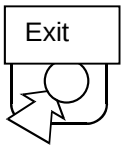
If a preset unit name is modified, this modification will apply to all additional products with this basic unit. For example, if you wish to change the basic unit with reference number 2 from 'litre(s)' to 'gram(s)', 'gram(s)' will be displayed for all applicable additional products.



Confirm the basic unit name/abbreviation by pressing 'enter'.

```
Unit no.:  2
Name:      grams
```

The cursor now returns to the basic unit's reference number in the second line. You are once again able to move from one basic unit to the next and make your next modification.



To terminate the sub-function and return to the 'View/modify additional products' sub-menu after making all your entries, press 'exit'.

(1.3) Additive pump

Mixed products

This sub-function of service function '7: Additional products' manages the mixed products in the system. The term 'mixed product' refers an additional product (additive) being added to the main product during the dispensing operation.

Activating an additive pump injects this additive (e.g. insulation against cold) from a storage container into the main product in a predefined mixing ratio.

The following sub-functions can be used to define the properties of the admixture:

- Mixture type
- Mixing ratio

A new screen is added to the system for this sub-function. The display appears as in the figure below:

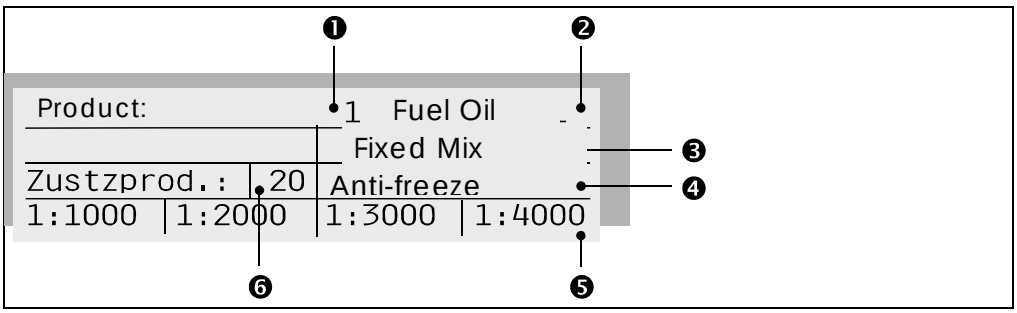


Fig 7-6: EVM graphic display when managing mixed products

Display field for:

1 Entry Product to be configured (setting 1 - 9)
2 Display Name of the configured product (from field 1)
3 Entry Mixture type;
1 = Blocked (product can not be dispensed)
2 = Unmixed (product is dispensed without an admixture)
3 = Fixed MIX (one of the 4 mixing ratios from line 4 can be selected before the dispensing operation)
4 = Variable MIX (mixing ratio can be user-defined before th dispensing operation with a ratio of 1:500 – 1:4000)
4* Display Additional product name (additive; max. 15 characters)
5* Entry 4 x mixing ratio (if all mixing ratios are identical e.g. 1:2000, there is only one mixing ratio)
6* Entry Additional product number (setting 20-34)
*** Only** entered/displayed if the product mixture type has been defined as 'fi MIX'.

Disabling/ releasing mixed products when changing additive

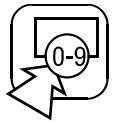
If the additive (additional product) in the additive pump storage container is changed, the affected mixed products in the system have to be reconfigured, i.e. depending on the additive available, the mixed products are either blocked or released.

If, as an exception, a product is allocated the property 'blocked', it will no longer be available for dispensing operations in the dispensing product selection (as though this product number were not stored in the system).

Procedure:

The system already displays the 'View/modify additional products' sub-menu:

```
Add. Products (view/modify)
1: Additional products
2: Unit
3: Additive pump
```



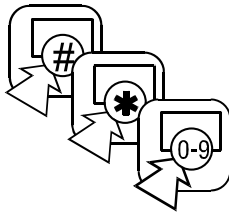
Enter `3`

```
Product:  1 Fuel Oil
          unmixed
```

Products which have to be dispensed without an admixture (without an additive) must all be allocated the property 'unmixed'.
If the properties 'fixed MIX' or 'variable MIX' are allocated to a product, a mixed product is created.

Selecting a mixed product

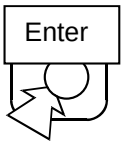
The cursor appears under the product number in the first line. Product numbers are set in the system and range from 1 to 9.



Press '#' to move on to the next number.

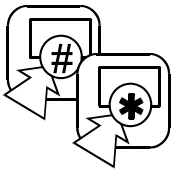
Press '*' to return to the previous number.

You can also select any of the product numbers directly by entering the corresponding number. It is not possible to select product numbers which have not been stored in the system.



Confirm your selected product number by pressing 'enter'. The cursor will move to the 'mixture type' field in the second line. The system expects you to define the mixture type. The following mixture types are provided by the system:

- Blocked: Product can not be selected during the dispensing operation and can not be dispensed.
- Unmixed: Product is dispensed without an admixture
- Fixed MIX: Product is dispensed with an additive in a fixed predefined mixing ratio
- Variable MIX: Product is dispensed with an additive in a variable predefined mixing ratio

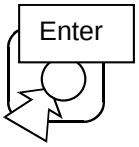


Press '#' to move from one mixture type to the next.
Press '*' to go back a step.

Establishing the mixture type

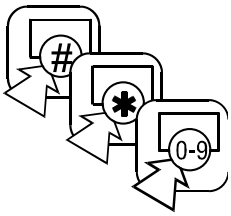
If either 'fixed MIX' or 'variable MIX' have been selected as the mixture type, the additional product (3) and mixing ratio (4) lines automatically appear on the display.

```
Product:  1 Fuel Oil
          unmixed
```



To configure the mixed product, select the desired mixture type and then press 'enter'.

The cursor moves to the reference number of the additional product in the next line. The system now expects you to define the additional product which is to be added to the product as an additive during the dispensing operation.

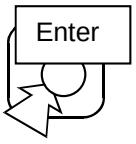


Press '#' to move through a list of the additional products which are stored in the system.

Press '*' to go back a step.

You can also directly select any of the reference numbers (from 20 – 34) by entering the corresponding number and pressing 'confirm'.

It is not possible to select reference numbers which have not been stored in the system.

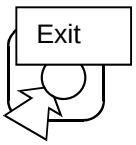


Confirm the selected additive by pressing 'enter'.
The cursor will move to the 'mixing ratio' in the last line.
The system offers the following fixed mixing values (max. 4) for the mixing ratio for all mixed products:

- 1:1000 (Field 1, left)
- 1:2000 (Field 2)
- 1:3000 (Field 3)
- 1:4000 (Field 4, right)

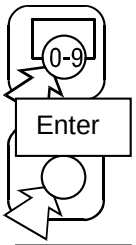
Copying fixed mixing values

You can copy these mixing values and configure the next mixed product in the same way.



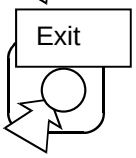
Changing fixed mixing values

Or, if necessary, you can overwrite them. If the value displayed is correct, simply press 'confirm' without making any further entries. New mixing ratios can be user-defined with a ratio of between 1:500 and 1:4000.

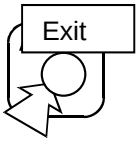


Confirm the new value by pressing 'enter'.

Repeat this procedure until you reach the fourth field of the mixed values.
Or copy the remaining mixing values by pressing 'exit'.



The cursor has now returned to the first line. Configure the next mixed product in the same way.



To end this function and return to the 'View/modify additional products' sub-menu, press 'exit' again.

(2) Load additional products into module

The additional products can also be saved onto a parameter module. However, the additional product data can not be saved onto the same module as the receipt and customer parameters. A separate parameter module is required, which can be ordered from Hectronic under order number:

2084.90 01 01 00

Both parameter modules (the module for the receipt and customer parameters and the module for the additional products) should be marked appropriately to prevent undesired mix-ups when saving data from the parameter module into the TWM 2084.

Procedure:

For information on how to insert the parameter module, please see **Chapter 5.3.5.3 Load parameters into module**.

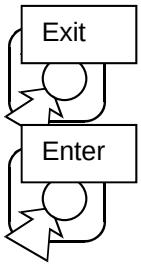
Danger of explosion! Explosion-proof systems must be switched off using the main TWM switch **at least 15 minutes** before the front panel on the electronic volume metre is opened.

The system displays service menu ‘7: Additional products:

```
Add. Products
1: View/ modify
2: Load into module
3: Load into TWM
```

Enter ‘2’.

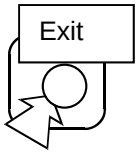
```
Add. Products
Load into module?
Confirm:      yes
Cancel:       no
```



By pressing ‘exit’, you are still able to terminate the function without saving the parameters to the module.

Alternatively, press ‘enter’ to save the parameters.

Once the saving operation has been successfully concluded, the system displays the message ‘function complete’ and then returns to the service menu.



To return to the main menu, press ‘exit’.

```
Mod. missing/ defect
```

If this message appears, check whether the module has been correctly inserted and the contacts are clean and free of grease. If this is the case but the function still does not work, please contact your truck body manufacturer or our customer service.

(3) Load additional products into TWM

Use this function to load the additional product data which was saved onto a parameter module back into the TWM 2084.

If function '3: Load additional products in TWM' is used, all the additional product data in the system will be overwritten with the additional product data from the module.

Procedure:

For information on how to insert the parameter module, please see **Chapter 5.3.5.3 Load parameters into module**.

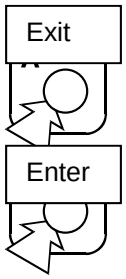
Danger of explosion! Explosion-proof systems must be switched off using the main TWM switch **at least 15 minutes** before the front panel on the electronic volume metre is opened.

The parameter module has already been inserted and the system displays service menu '7: Additional products':

```
Add. Products
1: View/ modify
2: Load into module
3: Load into TWM
```

Enter '3'.

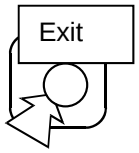
```
Load add. Products
Into TWM?
Confirm: yes
Cancel:  no
```



By pressing 'exit' you can still terminate this function without transferring the additional product data from the module to the system.

If you wish to overwrite the additional product data with the data on the parameter module, press 'enter'.

Once the transfer has been completed, the system will return to the additional product service menu.



To return to the main menu, press ‘exit’.

```
Mod. Missing/ defect
```

If this message appears, recheck whether the module has been correctly inserted and the contacts are clean and free of grease.
If this is the case but the function still does not work, please contact your truck body manufacturer or our customer service.

7.3.5.8 Create/ view product names

Service-function 8

Use this service function to manage the dispensing products in the system (1-9 = product names ‘main products and mixing products’) such as heating oil, diesel, petrol or mixed products.

The following functions can be used to manage the product names:

- View/modify parameters
- Load parameters into module*)
- Load parameters into TWM*)

The ‘modify parameters’ and ‘load parameters’ functions can not be activated in normal mode as they are linked to the sealed calibration switch.

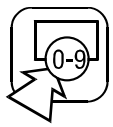
Overview of all stored products

The ‘view/modify parameters’ function is only of relevance when displaying all the stored products because the products blocked for dispensing are also displayed.

Procedure:

The system displays sub-menu ‘4: Service’:

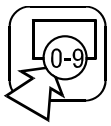
```
7: Additional products
8: Product names
9: Calibr. parameters
0: Calibration
```



Enter ‘8’

The system now displays the product names sub-menu:

```
Product names
1: View/ Modify
2: Load into module
3: Load into TWM
```

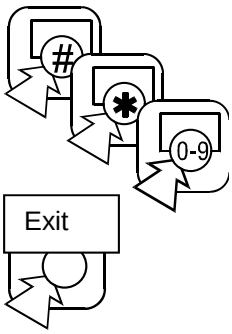


Enter ‘1’.

```
Product:  1
          Fuel Oil
```

The cursor appears under the product number in the first line.

Viewing stored products



Press ‘#’ to display a list of products which are recorded in the EVM. If desired, press ‘*’ to return to the previous reading.

You can also select the record for a particular product directly by entering the corresponding product number.

To terminate the function and return to the main menu, press ‘exit’.

7.3.5.9 Edit calibration parameters

Service-function 9

All the functions which appear under the ‘Calibration parameters’ menu item are solely required for calibration. This manual therefore provides no further description of them.
They can not be activated in normal mode as they are linked to the sealed calibration switch

7.3.5.10 Calibration

Service-function 0

This function is again only used for calibration purposes. The system provides the following related functions:

- Automatic calibration
- Measuring number = 1
  Use this function to revert the number of measurements on the delivery receipt (‘cumulative measurement no’) to one.

This function can not be activated in normal mode as it is linked to the sealed calibration switch.

7.3.6 Service 2 functions

The system's service 2 functions are:

- PC filling
- Diagnostics

Both functions are for a new type of system: TWM 2084 in connection with an external PC. The TWM 2084 can be controlled from the PC as a peripheral device.

The service 2 functions are not required for normal operation. To prevent system failures, these functions should only be activated in connection with an external PC when required.

Fault indicators in normal mode

```
PC:  filling
```

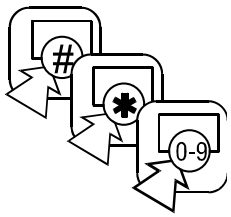
If this message appears on the display in normal mode, 'PC filling' has been activated as an exception and dispensing can not take place directly from the TWM 2084.
If this is the case, you must switch off this function for the normal mode (PC filling= 0)

Switching off PC filling

Procedure:

The system is in the starting position. The main menu is displayed:

```
1: Filling
2: Start trip
3: Statistics
4: Service
```



Press '#' or '*' to move up and down the main menu and display function '5: Service 2'. Select the function by entering '5'.

Alternatively, select the function directly by entering function number '5'.

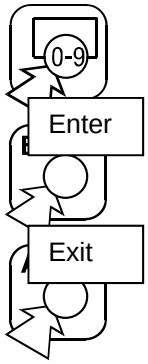
```
1: PC filling
2: Diagnostics
```

Enter ‘1’.

The ‘PC filling’ sub-menu now appears on the display:

PC filling: 1

The cursor automatically appears under the ‘PC filling’ entry field and displays the last (accidentally) entered value.



Enter ‘0’ (PC filling OFF).

By pressing ‘enter’ after entering ‘0’ the ‘PC filling’ function will be switched off in the system.

To terminate the function and return to the main menu, press ‘exit’.

Diagnostics-function

All the functions under menu item ‘2: Diagnostics’ are solely for the diagnostics of TDL interface errors and are therefore not described in detail in these operating instructions.

8 Parameters

A parameter is an adjustable value within a function or process. The function in question is only properly defined after a parameter value has been set and it continues to behave in the same way until the parameter value is changed.
This chapter provides a clear overview of the parameters that you, the operator, are able to set in TWM 2084. Where necessary, a detailed explanation is also provided for the function for which the parameters are set.

The TWM 2084 has three types of parameters:

- Calibration parameters
- Receipt parameters
- Customer parameters

8.1 Calibration parameters

These parameters can only be set when the TWM 2084 is calibrated since entry of the associated values is dependent on the sealed calibration switch.

The following functions are set using calibration parameters:

- Dispensing (for example, minimum dispensing volume, follow-on time, preset switching values, etc.)
- Temperature-volume compensation (for example: product-specific reference density and reference temperature)
- Specific vehicle data (for example, vehicle number, counter number and measuring point number)

8.2 Receipt and customer parameters

You set the receipt and customer parameters yourself in accordance with your individual business situation and requirements.
For details about how you can set these parameters, see Chapter 5.3.5.1 Editing receipt parameters and Chapter 5.3.5.2 Editing customer parameters.

List format

The parameter lists are arranged in six columns:
Column 1: No. = parameter number
Column 2: Parameter function
Column 3: Min = lowest number that can be set
Column 4: Max = highest number that can be set
Column 5: Def = “default“ value or basic value for the parameter
Column 6: Explanation of parameter values that can be set

Basic values

The basic values for the parameters are entered in column 5 as default values. If the “Load basic values” service function is executed, the parameter values that are currently set in the system are overwritten using these default values.

8.2.1 Receipt parameters

Parameters 1 to **33** are used to determine the contents and layout of the three receipt types that are stored in the system.

Invoice number

Parameter 2 controls the printing of the invoice number. If a sequential invoice number is to be printed on the invoice, the value in parameter 180 should be set to the invoice number that is to appear on the next invoice. Each time that an (original) invoice is printed, the system automatically increases the invoice number by 1, although the parame-ter value does not change.
Before each invoice is printed, the system checks whether the value in parameter 180 has been changed. If it has changed, the new parameter value is used as the next invoice number instead of the sequential number determined by the system. The invoice number can be reset to 1 at the start of the year.
Once the invoice number has reached 50,000 (the maximum parameter value), the system automatically reverts to invoice number 1.

Customer number

Parameter 3 controls the printing of the customer number. If a customer number is to be printed on the invoice, the value in parameter 156 should be set accordingly (see chapter 6.2.2 Customer parameters, section (1) Operating parameters).

Print zero

Parameter 4 = 1 must be set if the counter’s zero setting (“Display before starting”) is to be printed on the delivery receipt.

Data about mixed product

Parameter 11 = 1 or 2 must be set if the name is to be printed with/without the mixing ratio for the additive on the delivery receipt for mixed products. The meaning of the values is explained in the List of receipt parameters on the following page.

Empty lines

Parameter 27 specifies the number of empty lines at the start of the receipt. The list of receipt parameters shows where additional empty lines can be inserted.

Quantity at dispensing temperature

The line “Quantity at dispensing temperature” (= volume at the operating temperature) is only printed if parameter 19 = 1 and the printing of this line was enabled during system calibration (by default, it is not enabled).

List of receipt parameters

No.	Function	min	max	def	Description
1	Header	0	2	0	0 = no header 1 = „Delivery note“ 2 = „Invoice“
2	Invoice number	0	1	0	0 = not printed 1 = printed (see customer parameter 180)
3	Customer number	0	1	0	0 = not printed 1 = printed (3 to 8-digit entry in customer parameter 156)
4	Zero print	0	1	0	0 = without zero print 1 = with zero print
5	Start of filling	0	1	0	
6	End of filling	0	1	0	
7	Total	0	1	0	0 = not printed 1 = print compensated total amount (related to the measuring point)
8	Driver number	0	1	0	
9	Vehicle number	0	1	0	
10	Print date	0	1	1	activated = 1 deactivated = 0
11	Add product, ration	0	2	0	0 = w/o added product and ratio 1 = with added product, w/o ratio 2 = with added product and ratio
12	Preset value	0	1	0	
13	Average temperature	0	1	0	
15	Amount (incl. VAT)	0	1	0	
16	Basic price per 100l	0	1	0	
17	Total w/o VAT	0	1	0	Net price
18	VAT	0	1	0	
19	Uncompensated volume	0	1	0	
21	Dashed line after block 1	0	1	0	

Nr.	Funktion	min	max	def	Erläuterung
22	Dashed line after block 2	0	1	0	
23	Dashed line after block 3	0	1	1	
24	Dashed line after block 4	0	1	0	
25	Blank lines after header	0	99	0	Number of blank lines
26	Paper eject after printing (**only** Printer TM 295/296)	0	2	1	0 = paper remains on last position 1 = forwards 2 = backwards
27	Blank lines before header	0	99	0	
28	Blank lines before counter no.	0	99	0	
29	Blank lines before block 4	0	99	0	Number of blank lines before filling data
30	Blank lines before block 5	0	99	0	Number of blank lines before invoice data
31	Blank lines before block 6	0	99	0	Number of blank lines before add. products
32	Blank lines after block 6	0	99	0	Number of blank lines after add. products
33	Left margin (**only** for LQ 570 Printer)	0	99	0	0 = Receipt left-aligned (without left margin) 1-99 = Number of blanks moving the margin to the right (right margin)

8.2.1.1 Receipt format

The receipt is divided into six sections, which can be separated using a horizontal bar and empty lines. The sequence of sections and receipt lines cannot be changed.
Even if **parameter 1** = 2 is set, the price calculation function determines which title/header line is actually printed on the document.

- Delivery note:if the price calculation function is inactive
- Invoice: If using the active price calculation function with entry of a base price, amount with VAT or the entire net and gross amount

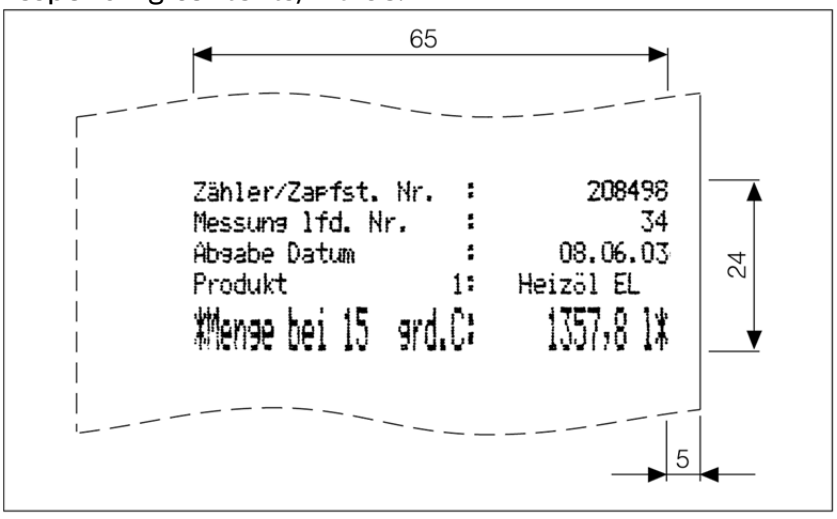
You should also be aware of the different types of receipt lines available for receipt configuration:

PTB-lines These cannot be switched off and are printed on all receipts as a minimum requirement. The printing of these lines is stipulated by the German PTB national metrology institute.

I lines These receipt lines are printed if the corresponding receipt parameter has a value of 1. The system has access the contents of these lines at all times.

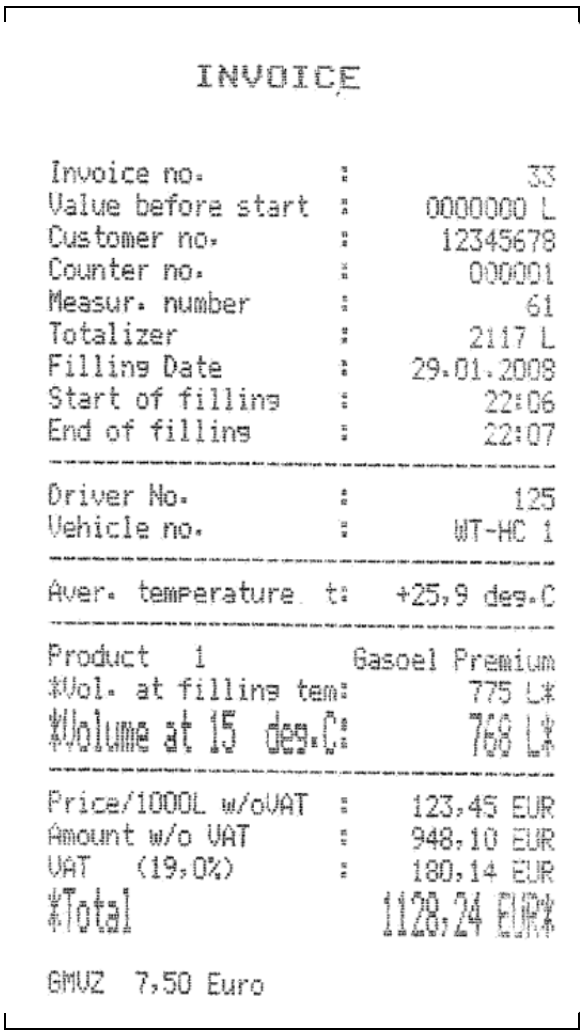
Z-lines These receipt lines are also set using the receipt parameters. As opposed to the I lines, they are only printed if the system holds the corresponding contents/ value.

Print area for smallest receipt



8.2.1.2 Example receipt

The following example receipt is intended to provide you with a quick introduction to individual receipt configuration. This full receipt is printed if all receipt parameters have a value of 1 (except for parameters relating to empty lines and the header line).



INVOICE

Invoice no. : 33
Value before start : 0000000 L
Customer no. : 12345678
Counter no. : 000001
Measur. number : 61
Totalizer : 2117 L
Filling Date : 29.01.2008
Start of filling : 22:06
End of filling : 22:07

Driver No. : 125
Vehicle no. : WT-HC 1

Aver. temperature t: +25,9 deg.C

Product 1 Gasoel Premium
Vol. at filling tem: 775 L
Volume at 15 deg.C: 768 L

Price/1000L w/oVAT : 123,45 EUR
Amount w/o VAT : 948,10 EUR
VAT (19,0%) : 180,14 EUR
Total 1128,24 EUR

GMVZ 7,50 Euro

Block 1

Block 2

Block 3

Block 4

Block 5

Block 6

Line	Parameter No.
I-line	27
I-line	1
I-line	25
I-line	2
I-line	4
Z-line	3
PTB-line	
PTB-line	
PTB-line	
PTB-line	
I-line	5
I-line	6
I-line	21
Z-line	8
Z-line	9
I-line	22
Z-line	13
I-line	23
PTB-line	
I-line	19
PTB-line	
I-line	24
Z-line	16
Z-line	17
Z-line	18
Z-line	15
I-line	15

8.2.2 Customer parameters

The customer parameters are divided into three groups:

- Operation parameters
- Access protection parameters
- VAT parameters
- Euro currency/exchange rate parameters (version 7 and above)

(1) Operation parameters

Parameters 150 to **185** are used to set functions relating to operation and dispensing.

Price calculator, price entry

The price calculator function is set using **parameter 150**.
If dispensing is generally to take place without using the price calculator, set **parameter 150 = 0**. The second entry line on the display usually remains empty during preparations for dispensing.
Setting **parameter 150 = 1** activates the price calculator function. During dispensing preparation, the second entry line in the display requests the entry of a basic price. If dispensing is to take place without price calculation, you can switch off the price calculator by confirming the entry line for the basic price without entering a value.

Parameter 151 specifies whether the basic price should be entered inclusive or exclusive of VAT.
If **parameter 151 = 1**, the basic price has to be entered inclusive of VAT. The amount displayed updates during dispensing.
If **parameter 151 = 0**, the basic price has to be entered exclusive of VAT. In this case, the amount displayed does not update during dispensing.

Customer number

You use **Parameter 156** to specify whether a customer number can be entered during preparations for dispensing. The customer number can be printed on the delivery receipt. You use the parameter value to determine the maximum number of digits that will be accepted when a customer number is entered. Example: If **parameter 156 = 4**, the customer number is permitted to have a maximum of 4 digits. This parameter value would also permit customer numbers that were 1, 2 or 3 digits in length. The function is activated by entering a parameter value between 3 and 8. During preparations for dispensing, the tank truck operator is asked to enter a customer number. This entry is not compulsory. The function can be skipped by confirming it without entering a value.

If customer numbers are not to be used in general, set **parameter 156 = 0**. When preparing for dispensing, the first entry line on the display remains empty.

Driver number

You can use **parameter 157** to stipulate that a driver number is entered at the start of the trip. The driver number is listed in the trip log header. You use the parameter value to determine the maximum number of digits that will be accepted when a driver number is entered. Example: If **parameter 157 = 2**, the driver number is permitted to have a maximum of 2 digits. This parameter value would also permit driver numbers that were 1 digit in length. This function is activated by entering a parameter value greater than 0 (zero). It is not possible to start a trip without entering a driver number.
If driver numbers are not to be entered, set **parameter 157 = 0**.

Trip start, trip log

Parameter 161 controls both the “Start trip” and “Print trip log” functions. The individual parameters have the following meanings:
Parameter 161 = 0: The trip start is not compulsory. The trip log is printed from the statistics. It is only possible to print this log after the trip has been completed. The log printout lists all dispensing operations that have taken place since the last printout was made (up to a maximum of 100 entries). If 101 or more dispensing operations have been made, the data from the 100th operation is overwritten. Both logs (the current and previous log) can hold 100 entries.
Parameter 161 = 1: The trip start is not compulsory. The trip log is printed from the statistics. It is only possible to print this log after the trip has been completed. The log printout lists all dispensing operations that have taken place since the last printout was made (up to a maximum of 100 entries). After 50 dispensing operations, the display shows “Print trip log”. Dispensing can only be continued after the trip log has been printed.
Parameter 161 = 2: The trip start is compulsory. The trip log is printed from the statistics. It is only possible to print this log after the trip has been completed. The log printout displays all dispensing operations from “Start trip” to “End trip”. To prevent the driver from printing out this data, the “Trip log” function in the “Statistics” menu can be protected using the master code
Parameter 161 = 3: The trip start is compulsory. The trip log printout options are called up when “End trip” is selected. The message “Print trip log” appears. If the trip log has not been printed, it is not possible to initiate a new trip and dispensing operations cannot be carried out. The log printout displays all dispensing operations from “Start trip” to “End trip”. The trip log can also be printed using the corresponding function in the “Statistics” menu.

Receipt language

The language in which a delivery receipt is issued can be different to the dialog language used on the display user interface. You use **parameter 165** to specify the language in which the delivery receipt is printed. You do this by selecting a parameter value from 0 to 10. The language key for the numbers from 0 to 10 always corresponds to the language key that has been set for the dialog language in **parameter 155**. This handbook contains the language key available in the standard version of TWM 2094. However, the language key can vary by country.

If you want to enable selection of the receipt language before the receipt is printed, set **parameter 165** = 98.

The basic value for **parameter 165** = 99. This setting means that the receipt and dialog languages are identical.

Receipt type

You use **parameter 166** to specify the type of delivery receipt that is printed once dispensing is complete.
If you usually only work with one receipt type, you should use document type 1 and set **parameter 166 = 1** (=basic value).

If you want tank truck operators to be able to select the receipt type before printing the receipt, set **parameter 166 = 4**.
An “invoice” containing the basic price, VAT amount and total amount can only be printed if the price calculator function is used and the receipt parameters for the receipt type that have been set/ selected permit the printing of this invoice data (see also **chapter 8.2.1 Receipt parameters)**. If these conditions are not met, a “delivery note” is printed automatically.

Text language selection

You use **Parameter 184** to specify whether the EVM displays a “Language selection” option for choosing between the user interface languages of German, French and Italian when the system is started.

If only one dialog language is to be used as standard for menu navigation, set parameter 184 = 0 (language selection is “inactive”). The dialog language corresponds to the language key that was entered in **parameter 155** to set the dialog language in the system.

If you set parameter 184 = 1 (language selection “active”), parameter 155 does not have any significance. When the TWM 2084 is started up, you see the language selection dialog and can choose between “DEUTSCH”, “FRANCAIS” and “ITALIANO”. The French and Italian product texts are saved in the RAM memory.

List of operating parameters

No.	Funktion	min	max	def	Description
150	Price calculator function	0	1	1	0 = off 1 = on, activated through price entry
151	Basic price	0	1	0	0 = without VAT 1 = with VAT
152	Time interval (flow rate measuring)	1	4	2	1..4 = time interval in seconds
153	Display contrast	0	31	17	0 = maximum brightness (from EVM No. 314) 31 = minimum brightness values from 7 to 31 make sense
154	Keystroke sensitivity	0	3	1	0 = low 3 = high
155	Dialogue language	0	10	0	0 = German 1 = Italian 2 = French 3 = English 4 = Spanish 5 = Hungarian 6 = Czech 7 = Croatian 8 = Dutch 9 = Slowenian

No.	Funktion	min	max	def	Description
					10 = Polish
156	Customer number	3	8	4	0 = no entry 3 = minimum number of digits 8 = maximum number of digits
157	Driver number	1	6	3	0 = no entry at tour start 1..6 = Number of digits
158	Paper feed function (Printers TM 295/296 only)	0	1	1	0 = no paper feed function; must be set if two measuring systems are connected to one printer (inactive) 1 = Paper feed function active
159	Timeout for automatic EVM switch-off	5	40	10	0 = inactive 5..40 = minutes
160	Release of control switch	0	1	1	0 = up to 3 seconds after filling 1 = permanently, except during filling
161	Trip start- Trip report	0	3	0	0 = Trip start not mandatory, printing not requested 1 = Trip start not mandatory, printing requested after trip end or after 50 fillings 2 = Trip start mandatory, no separate printing request 3 = Trip start mandatory, printing requested after trip end or after 50 fillings
162	Preset: off/ volume/ amount	0	23	1	Preset: Last digit 0 = no preset possible 1 = volume preset possible 2 = amount preset possible 3 = volume-/ amount preset possible Second digit 0 = no preset requested when filling is continued 1 = if a preset has been made for the first filling, a new preset value is requested for continued filling. 2 = like „1“, the new preset value is treated like a sum.
163	Display of flow rate	0	2	1	0 = inactive 1 = permanently displayed 2 = displayed if #-key is pressed
164	Display of product temperature	0	2	2	0 = inactive 1 = permanently displayed 2 = displayed if #-key is pressed
165	Select receipt language	0	99	99	0 = Language 0 1 = Language 1

No.	Funktion	min	max	def	Description
	(see parameter 155)				... 10 = Language 10 ... 98 = select before printing 99 = same as dialogue language (parameter 155)
166	Select receipt type	1	4	1	1 = receipt type 1 2 = receipt type 2 3 = receipt type 3 4 = select before printing
167	Maximum volume dispensed	0	65000	0	0 = no limitation; maximum volume of 99900 litres possible 1..65000 = limitation in litres
169	Move receipt text to the left	0	8	0	
170	Vehicle number				9-digit vehicle number From programme release 10I
171	Invoice numbers starting from	0	50000	1	0 = no invoice number 1..50000 = first invoice number
180	Dual measuring system (only if equipped)	0	1	0	0 = operation as single measuring system 1 = automatic configuration single or double measuring system
Nr.	Select receipt type	1	4	1	1 = receipt type 1 2 = receipt type 2 3 = receipt type 3 4 = select before printing
183	Maximum volume dispensed	0	65000	0	0 = no limitation; maximum volume of 99900 litres possible 1..65000 = limitation in litres
184	Dialogue language (from programme release 7)	0	1	0	0 = inactive (OFF) 1 = active (ON) Language selection (German, French, Italian) during EVM booting, additional entry of (I) and (F) product descriptions via service menu „8 product descriptions.“
186	Satam-metering box	0	1	0	0 = Standard 1 = Satam
187	Threshold value	0	255	0	Flow value

(2) Access protection parameters

Parameters 191 and **193** specify the 4-figure code numbers for the driver (driver code) and master (master code).

Parameters 200 to **203** enable access protection for the main system menu items (1: Filling, 2: Start trip/terminate trip, 3: Statistics and 4: Service). Each of these main menu items can be freely accessible or protected by a driver/ master code.

When using access protection

When using access protection, menu item “4. Service” must also be protected from access (**parameter 203** = 2 or 1) since service function “2. Customer parameter” can also be used to edit the access protection settings.

Forgotten code number

If you have forgotten the code number and are therefore unable to access menu item “4. Service”, please contact your service workshop/truck body manufacturer. They will be able to provide you with further assistance.

List of driver/ master code parameters

No.	Function	min	max	def	Description
191	Driver code	0	9999	0	Example: 1234
193	Master code	0	9999	0	Example: 3210
199	Access to function „Service 2“ (external PC)	0	2	0	0 = freely accessible 1 = Driver code or master code 2 = only master code
200	Access to function: Filling	0	2	0	0 = freely accessible 1 = Driver code or master code 2 = only master code
201	Access to function: Start trip	0	2	0	0 = freely accessible 1 = Driver code or master code 2 = only master code
202	Access to function: Statistics	0	2	0	0 = freely accessible 1 = Driver code or master code 2 = only master code
203	Access to function: Service	0	2	0	0 = freely accessible 1 = Driver code or master code 2 = only master code

(3) VAT parameters

In the TWM 2084 system, you can use **parameters 204, 206 and 208** to store up to three different VAT rates.

Parameters 210 – 212 are used to assign the correct VAT rate to individual dispensing products and **parameter 213** is used for additional products.

List of parameters for VAT

No.	Function	min	max	def	Description
204	VAT rate 0	0	1000	200	Example: enter „200“ for 20%
206	VAT rate 1	0	1000	160	See above example
208	VAT rate 2	0	1000	75	See above example
210	Allocation for products 1-3	000	222	111	1. digit = Product 1 2. digit = Product 2 3. digit = Product 3
211	Allocation for products 4-6	000	222	111	1. digit = Product 4 2. digit = Product 5 3. digit = Product 6
212	Allocation for products 7-9	000	222	111	1. digit = Product 7 2. digit = Product 8 3. digit = Product 9
213	Allocation for additional products 20-34	000	222	111	1. digit = Add. products 20 to 24 2. digit = Add. products 25 to 29 3. digit = Add. products 30 to 34

Create VAT rate

Three VAT rates can be stored in the system: 0, 1 and 2. One decimal place must also be entered when specifying a VAT rate. For example, you must enter “160” if you want to set a VAT rate of 16%. This enables VAT rates to be entered in 0.5% intervals.

Restrict the number of VAT rates to those that you actually need. For example, if you can use one VAT rate for all product calculations (dispensing and additional products), you should generally use VAT rate 1. You can find the reason for this in the parameter list: all parameters used to assign VAT rates to products (**parameters 210 to 213**) have a basic value (= default value) of 1, which means they are automatically assigned VAT rate 1 that has been stored in the system using **parameter 206**, unless other settings have been made.

Assign VAT rate

If you have to use more than one VAT rate for different products, you must enter the different VAT rates and change the VAT assignments to dispensing and additional products on an individual basis.
To do this, create a second VAT rate using **parameter 204**, for example. If you require a third VAT rate, you can create this using **parameter 208**.

... for dispensing products

You use parameters 210, 211 and 212 to assign a VAT rate for dispensing products and parameter 213 to assign one for additional products.
For the dispensing products, each individual product from 1 to 9 (as listed in the parameter list) can be assigned one of the three VAT rates.
The following example of VAT assignment is intended to clarify how VAT rates are assigned to dispensing products.

Example: If

- Product 1 has VAT rate 0
- Product 2 has VAT rate 1
- Product 3 has VAT rate 2

Then, parameter 210 must be set to value “012”.

... for additional products

A VAT rate is not assigned to each individual additional product. Instead, three groups are formed based on the additional product number (from 20 to 34). You use the first digit in **parameter 213** to assign one of the three VAT rates of 0, 1 or 2 to the first five products with additional product numbers 20, 21, 22, 23 and 24. You use the second digit in **parameter 213** to assign a VAT rate to the second group with product numbers 25, 26, 27, 28, 29. You use the third digit to assign a VAT rate to the final five additional products with product numbers 30, 31, 32, 33 and 34.

Invoice

If more than one VAT rate has been created, the tax amounts for the individual VAT rates are listed separately on the invoice. In this case, empty lines above and below block 6 are not printed.

RECHNUNG

Rechnungsnummer	:	261
Anzeige vor Start	:	00000 l
Kundennummer	:	4258
Zähler-Nr.	:	084032
Meßstellen-Nr.	:	1
Messung lfd. Nr.	:	6
Abgabe Datum	:	10.08.03
Abgabe Beginn	:	16:20
Abgabe Ende	:	17:09
Fahrzeugnummer	:	VS-MK 999
Vorwahlwert	:	3000 l
Mittl. Temperatur	t:	+20,7 grd.C
Produkt	1:	Heizöl EL
*Menge bei Abgabetmp	:	3164 l*
**Menge bei 15 grd.C	:	3149 l**
Preis/100l m.MWSt	:	39,10 EUR
Betrag o.MWSt	:	1026,05 EUR
P21 5 Liter	:	25,00 EUR
MWSt (20,0%)	:	210,21 EUR
P31 2,0Liter	:	10,00 EUR
MWSt (7,5%)	:	0,75 EUR
P25 1 l	:	5,00 EUR
P26 4 Liter	:	20,00 EUR
MWSt (15,0%)	:	3,75 EUR
**Gesamtbetrag	:	1300,76 EUR**

(4) Euro currency/ exchange rate parameters

You use parameters 243 and 244 to specify the function for converting/setting the rate between national currencies and the euro.

In program versions earlier than 2084 7510012, EUR must be set up individually (set parameter 243 to 2). The EUR function is integrated as of program version 2084 7510007.

List of parameters fort he euro currency/ exchange rate

No.	Function	min	max	def	Explantion
243	Currency	0	3	0	0 = National currency as main currency 1 = National currency as main currency, Euro as secondary currency 2 = Euro as main currency 3 = Euro as main currency, national currency as secondary currency
244	Rate				Enter the exchange rate to 8 figures (The DM – euro exchange rate is fixed at 1.95583)

The trip must have ended or the log printout must have been made before a conversion can be made between euro and the national currency. This ensures that the last trip can be evaluated (accounted for) using the national currency that has been set.

Euro-Währung und Euro-Kurs festlegen

You use parameter 243 to specify how the national currency and euro are assigned as the main or secondary currencies.

The euro exchange rate is specified using an 8-digit string in **parameter 244**.
You enter the information as usual, in the same way as when entering product names. The decimal positions can be freely chosen, which takes into account the full range of euro exchange rates.

For example:

- Great Britain Pound = 0.671218
- Poland Zloty = 3.758623
- Hungary Forint = 245.9584

Display

After converting to euro or setting this as the main currency, the EVM displays the special euro sign on the display and prints the abbreviation “EUR” on documents. This is done in all cases where the national currency abbreviation would previously

have been used.

Receipt printing

A common display format applies instead of national decimal places, multipliers and currency amounts:

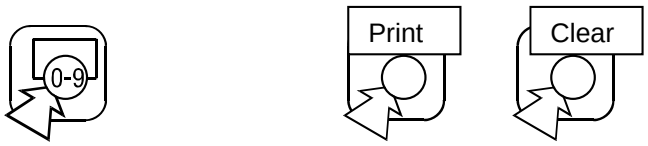
Price: XXX.XX EUR/100l
Amount: XXXXXXX.XX EUR

If a second currency is configured in customer parameter 243, two further lines are printed after the totals line. For example:

“1 EUR = 245.9584 HUF” (short line)
“Total amount 21152.42 EUR” (line for the second currency)

8.3 Assignment of keys and character set

The following key assignment is valid for entering additional product names. Please note that you can create capital letters using the Receipt key.



Key „1“:	Press 1x	a	ä	A
	Press 2x	b		B
	Press 3x	c		C
	Press 4x	1		
Key „2“:	Press 1x	d		D
	Press 2x	e		E
	Press 3x	f		F
	Press 4x	2		
Key „3“:	Press 1x	g		G
	Press 2x	h		H
	Press 3x	i		I
	Press 4x	3		
Key “4”:	Press 1x	j		J
	Press 2x	k		K
	Press 3x	l		L
	Press 4x	4		
Key „5“:	Press 1x	m		M
	Press 2x	n		N
	Press 3x	o	ö	O
	Press 4x	5		
Key „6“:	Press 1x	p		P
	Press 2x	q		Q
	Press 3x	r		R
	Press 4x	6		
Key „7“:	Press 1x	s		S
	Press 2x	t		T
	Press 3x	u	ü	U
	Press 4x	7		
Key „8“:	Press 1x	v		V
	Press 2x	w		W
	Press 3x	x		X
	Press 4x	8		
Key „9“:	Press 1x	**y**		**Y**
	Press 2x	**z**		**Z**
	Press 3x	**-** (hyphen)	**.** (full stop)	
	Press 4x	**9**		
Key „0“:	Press 1x			
	Press 2x	**Blank**		
	Press 3x	* (asterisk)		
	Press 4x	, (comma)		
		0		

8.4 Product code table

Enter the allocations of the fill products to the fill product number into the table provided

Product allocation

No.	Product description
1	
2	
3	
4	
5	
6	
7	
8	
9	

8.5 Index

9 Service and Maintenance

For any kind of maintenance work please refer to the general safety rules described in chapter 1.3

For your own safety, do not tamper with the electrics. Any damage or injury caused in this way will not be covered by the warranty.

Do not touch any electronic components in the system. Electrostatic discharge (ESD) can lead to the malfunction or destruction of the electronic components.

9.1 Changing the printer cartridge

Cartridges for your printer are available from your truck body manufacturer or from our service department using Hectronic order number:

HS11.5600.088

If you acquire your cartridge from a different source, you must check before changing it whether the new cartridge is compatible with your printer. Compare the manufacturer's information on the packaging with the information on your printer's name plate. The name plate is on the right hand side of the printer.

The use of unsuitable cartridges may result in the printer malfunctioning. Only use ribbons that are suitable for this type of printer. Otherwise, Hectronic will not accept any warranty claims.

Procedure: Disconnect the printer from the mains. Switch the on/off button on the printer to OFF (0).

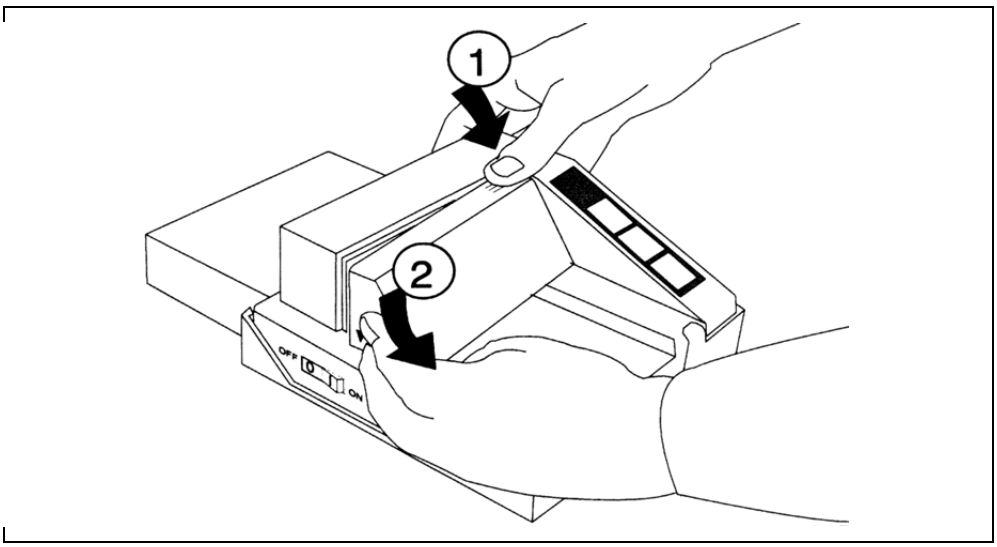


Fig. 9-1

Open the cover by pressing gently on the indents (Fig. 9.1, ①) at the top of the cover and remove by pulling it forward on the left hand side (Fig. 9.1 ②).

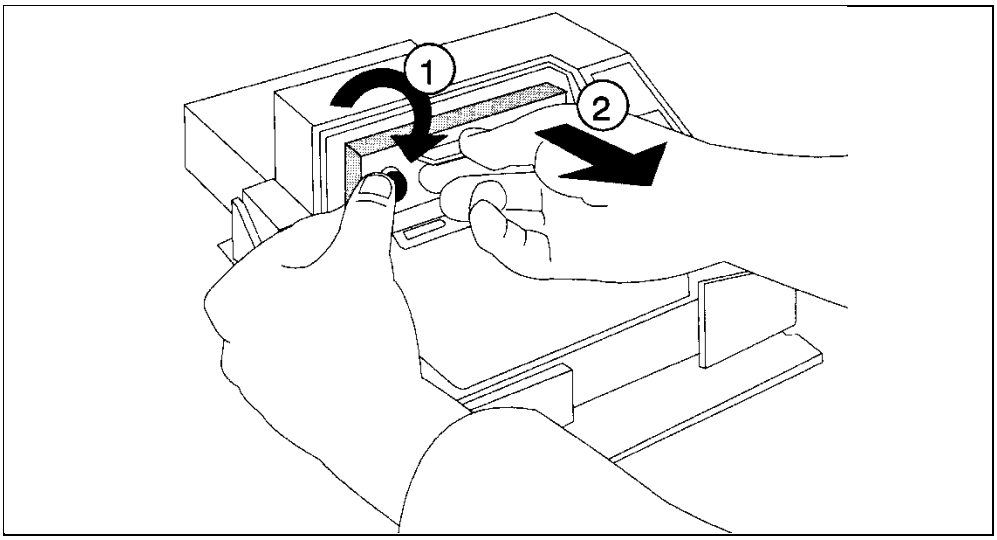


Fig. 9-2

- If necessary, tighten the ribbon by turning the tightening button in the direction of the arrow (Fig. 9.2, ①)
- Hold the cartridge in both hands and pull it out (Fig. 9.2, ②).

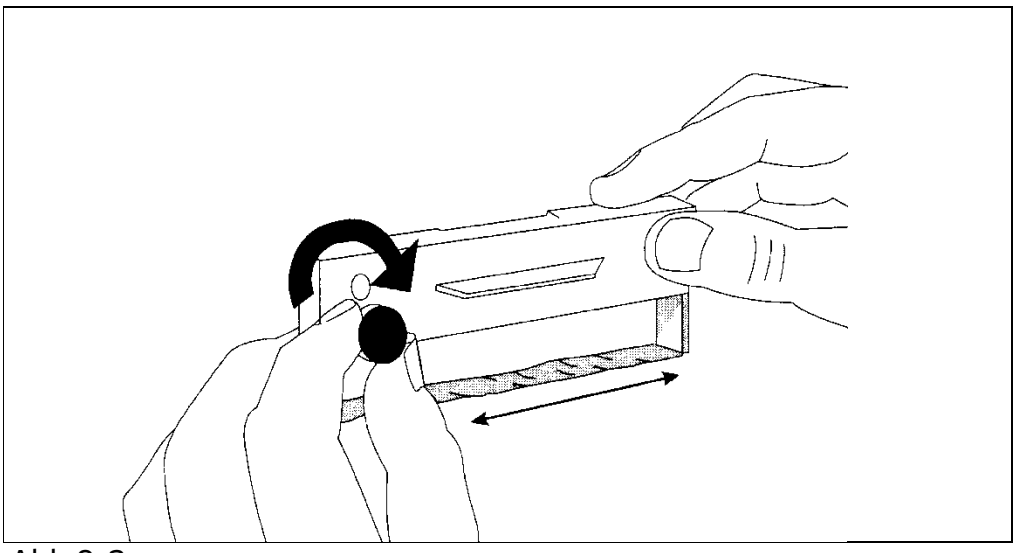


Abb 9-3

- Before inserting the new cassette, ensure that the ribbon is taught, is not creased and has not been twisted. These problems must be corrected before the cartridge is inserted and can be done by turning the tightening button in the direction of the arrow (Fig. 9.3).

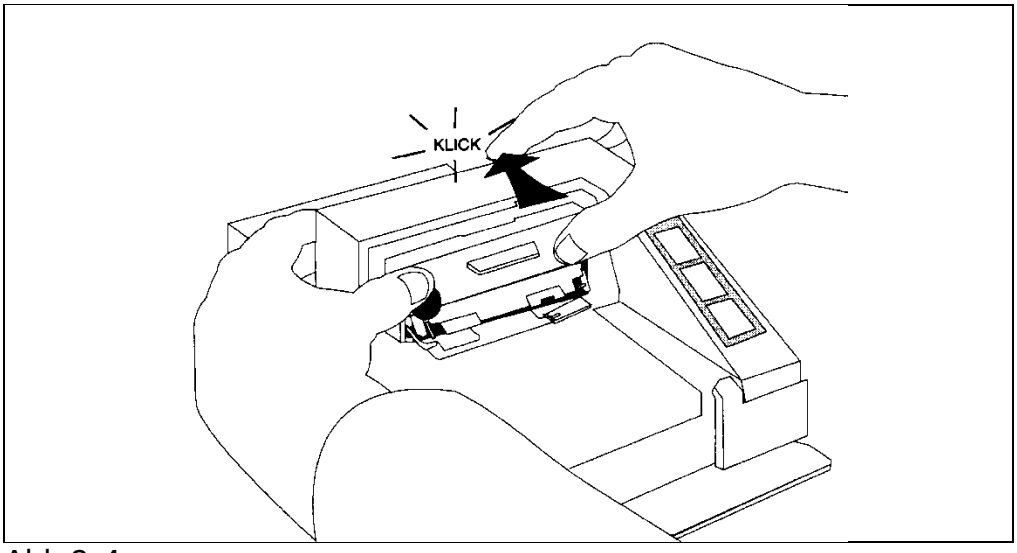


Abb 9-4

- Insert the cartridge into the printer with the tightening button facing forwards (Fig. 9.4).
- Apply a light pressure to ensure the cartridge is seated in the cartridge mount (Fig. 9.4).

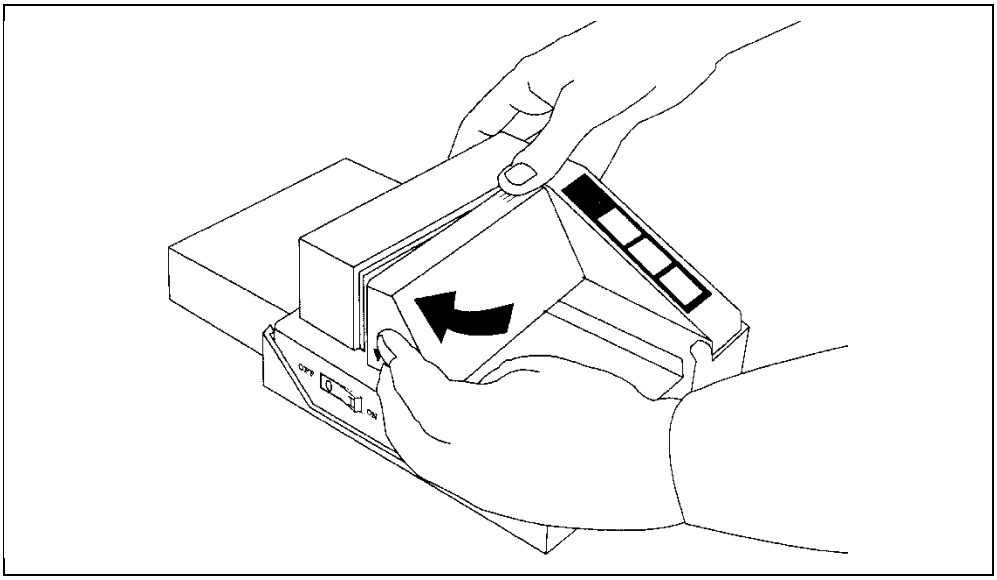


Abb 9-5

- Close the cover (Fig.9.5). First insert the upper part, then press the left side backwards.
- Set the printer switch to ON (I).

9.2 Cleaning the housing

9.2.1 Electronic volume meter

It is important to clean the housing of the electronic volume meter regularly to keep the operating panel and the display free from dirt and dust and to avoid erroneous entries.

The even metal surface of the operating panel is resistant to wear-and-tear and easy to clean.

Recommended detergents

- Dishwashing liquid
- Detergent for anodised surfaces

Detergents not suitable

Do not use the following detergents for cleaning:

- Acids or alkaline detergents
- Cleaning powder, steel wool, etc.

How to clean

- Clean parts with a soft cloth, water and dishwashing liquid.

- Apply detergent for anodised surfaces with a soft cloth. Then polish the surface.

Do not use steam or high pressure cleaners. Water or water steam may penetrate the housing and damage the electronics.

9.2.2 Printer

If necessary, clean the printer housing using the following detergents:

Recommended detergents

- Household cleaners that do not damage the plastics housing
- Warm soap water

Detergents not suitable

Do not use the following detergents for cleaning:

- Solvent-based cleaners

How to clean

- Remove dirt with a soft cloth, water and cleaner
- Use a soft cloth to dry

You receive a warning whenever the TWM 2084 determines an error.

Operator errors are always displayed using a clear text message
System errors are displayed as coded “ERR” messages; for example, “ERR 60”

Under no circumstances should you attempt to rectify a system error yourself. Always contact your service workshop/truck body manufacturer or Hectronic’s customer services.

When contacting the service technician, you should have your TWM system’s serial number and information about its program version to hand (**chapter 5.3.1 Switching the system on** explains how you can find this information).

Faulty EVM

If the electronic volume meter itself is faulty, you should first try to rectify the fault by using the main TWM switch to turn the system off and on again.
If this does not fix the fault, the system must be turned off again using the main TWM switch to prevent more serious damage being done to the device.

Faulty temperature sensor

The temperature sensor is tested to ensure that it is functioning correctly when the system is started up and prior to each dispensing operation (once preparations for dispensing are complete and before the valves are released). The message “Error: temperature sensor” appears if a fault is determined for the temperature sensor during self-testing. If this is the case, you can only dispense products for which temperature-quantity compensation does not need to be carried out.

The list on the following page shows the error codes and their meaning.

Group 0: Parameterisation and program memory errors

01: CRC errors in the X-RAM parameter area and EPROM; for example, system not yet parameterised, dispensing not possible

Group 1: Display test

10: Display error
15: Temperature sensor or temperature measurement connections faulty
16: Forbidden high temperature (> 10 °C)

Group 2 - 4: Dispensing system AFS 60 test

20: Lower limit switch faulty or not pressed
21: Upper limit switch faulty or not pressed
24: Upper limit switch not cleared in time
25: Upper limit switch not pressed in time
26: EEPROM faulty
28: Discharge resistance A-C faulty
29: Discharge resistance B-C faulty
30: Discharge resistance A-C and B-C faulty
40: CAN bus send error
41: AFS module faulty

Group 5: Additive pump test

50: -Resting position (Sening and Blackmer Mouvex),
-Storage container empty (Sening)
51: Additive supply, storage tank empty (Blackmer Mouvex)
52: Additive flow is too great (Sening and Blackmer Mouvex)
53: -Air or dirt in the system/storage tank empty (Blackmer Mouvex)
-Cycle time exceeded (Sening)
54: Maximum additive quantity exceeded (>200,000 litres; Sening and Blackmer Mouvex)

Group 6: Totalizer and check sum errors

60: CRC error in totalizer not permitted to be set to zero: totalizer was deleted
66: Incorrect dispensing data, check sum for dispensing data with errors

Group 7: Errors in pulse generator

71: Pulse generator 1 faulty, power check
75: Overload current at magnet valve

Group 8: Pulse errors

80: Too many reverse pulses
81: Pulse generator error; pulse channel check
83: Pulse channels short-circuited or feed frequency too high

11 Appendix

Technical data

Display	Backlit graphics LC-Display 240 x 64 dots
Key pad	Non-stroke piezo key pad resistant to wear and tear, numeric key pad, alpha characters superimposed 6 function keys
Interfaces	20 mA current interface for printer 1 analog entry for temperature sensor 2nd entry for dual measuring system 1 pulse entry for pulse generator 2nd entry for dual measuring system 4 outputs for solenoid valves CAN-bus for LRC-3
Data buffering	4 years by battery (battery exchange during calibration)
Power supply	24 V DC (min. 18 V, max. 32 V, overvoltage protection available)
Ambient temperature	-20° C to +55° C
Protection class	AI version: Ⓔx II 2 G Ex d ib [ib] IIB T6
Dimensions	AI version: H 300 x B 290 x T 150 mm AIII version: H 280 x B 260 x T 120 mm
Weight	AI version: 16,9 kg AIII version: 14,4 kg
Data buffering	4 years by battery (battery exchange during calibration)
PTB-Approval Switzerland Austria Type approval	5.543/94.08 ZA 150 OE 95/R 261, OE 95/r 266 TÜV 03 ATEX 2023 X

Printer

	- Colour ribbon printer - Paper format B 80 to B 182 mm - Paper thickness up to 0,32 mm
Power supply	24 V DC (voltage stabilizer for overvoltage protection)
Ambient temperature	+5° C to +45° C
Dimensions	H 101 x B 180 x T 190 mm
Weight	2,6 kg (with mounting plate)
PTB-Approval	5.574/94.71

Pulse generator

Gear ratio	25 pulses/ revolution
Revolutions	Max. 700 rpm
Power supply	4,5 V to 15 V (+/- 15%)
Power consumption	50 mA
Phase shift	90° (+/- 30°)
Ignition protection class	⟨Ex⟩ II 2 G Ex d IIB T5
Type Approval	DEMKO 01 ATEX 130641 X

Temperature sensor	AI	AIII
Measuring element	Pt 100 (according to DIN)	Pt 100 (nach DIN)
Installation length	70 mm	70 mm
Accuracy	1/3 DIN B	1/3 DIN B
Temperature range (TMU)	-40° to +60° C	-40° bis +60° C
Ignition protection class	⟨Ex⟩ II 1/2G Ex e II T5,	T5, T6, T4 bis T3
Type Approval	IBExU 01 ATEX 1066 X	
PTB-No.	5.581/81.01 and 5.543/81.01	

Solenoid valves

Design	Direct acting 3/2-way-seat valve
Pressure range	0 - 10 bar
Temperature range	-15° C to +50° C (explosion proof version +40°)
Nominal voltage	24 V DC
Ignition protection class	⟨Ex⟩ II 2G Ex m IIC T5, II 3D IP65 T 95 °C
Type Approval	PTB 03 ATEX 2018 X

Solenoid valves

Dimensions	L 230 x B 200 x H 110 mm
Protection class	IP65
Design	Up to a maximum of 8 valves Ex ia IIC T6 or a maximum of 8 non-explosion-proof valves
Pressure range	0-7 bar
Valve control voltage	24V -10% +25% 0.7W
Ambient temperature	-10....+40°C
Medium temperature	-10....+30°C

Measuring chambers

Oval wheel meter	PTB 5.241/94.49
Sliding vane meter	PTB 5.243/94.39
Oscillating piston meter	PTB 5.232/94.32

12 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.

12.1.1 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.

13 Notice

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