System LactoCorder®
Operating Instructions

CE

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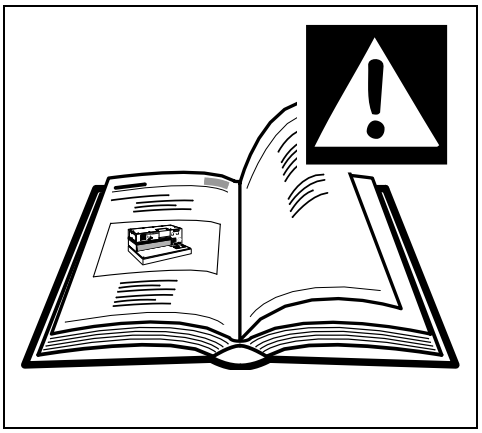
1 INTRODUCTION

1.1 INFORMATION



These operating instructions should be read before unpacking and commissioning and must be stringently observed!

The device should only be used by personnel familiar with the operating instructions and valid regulations concerning work safety and accident prevention.

1.2 ABBREVIATIONS USED

LC	= LactoCorder®
DP / DPK	= Datapack
CNo.	= Animal number
MYT	= Milk yield test
OD	= Herd/farm/operating data
EM	= Expected daily milk yield
LS	= Lactation status

The following designations or symbols are used in the operating instructions for particularly important information

	CAUTION	**Information concerning a risk of injury to personnel or risk of damage to components of the device**

	NOTE	**Special information or operating instructions**

1.3 SPECIAL REGULATIONS

	CAUTION	**The LactoCorder is a hi-tec electronic measuring device which should obviously be handled with care.** **The following methods of handling and applications are *not permitted* and will release the manufacturer from all obligations under the terms of the guarantee:** ⇒ **Submerging the device or cleaning with a high-pressure cleaning device, compressed air or direct jets of water (IP 64)** ⇒ **Use of solvents or agents containing solvents and unusual agents or, more specifically, cleansing agents not approved for use with milking machines** ⇒ **Separate mechanical or chemical cleaning of measuring probes (e.g. scrubbing with scouring agents or similar substances)** ⇒ **Influence of mechanical forces due to shocks or incorrect handling** ⇒ **Being dropped as well as transportation damage** ⇒ **Work carried out on the device other than that contained in the maintenance and repair instructions** ⇒ **Re-tightening of screws without observing permissible torques (Ncm)**

1.4 INSTRUCTIONS FOR TAKING CARE OF THE INSTRUMENT

The following instructions for taking care of the instrument must be observed to maintain the functionality of the LactoCorder®

- Carry out the storage battery care program regularly
- Clean the interior using the cleaning machine after taking measurements (see separate instruction: cleaning monitoring)
- Smear the sump rotary valve periodically with perfluorinated instrument grease (art. 1416), or when it is stiff
- It is recommended to replace all rubber parts and O-rings annually or after 1500 operating hours (see Repair and Spare Parts Catalogue)

1.5 APPROPRIATE AND CORRECT USE

The LactoCorder® is exclusively intended for checking the quality and yield of dairy milk.

Any other or further use of the device is regarded as inappropriate. The manufacturer is not liable for any damage resulting from the aforementioned and all risks are borne solely by the user!

Observation of the operating instructions and conforming to inspection and maintenance conditions are also an integral part of correct and appropriate use of the device.

1.6 TRANSPORT

1.6.1 Packing

Retain the carton and packing material for any later transportation to ensure that the device can be transported safely.

1.6.2 Unpacking / incoming inspection

The shipping container for machines and devices can withstand normal stresses incurred during road, rail or air transportation.

Before commissioning the device, ensure that the parts listed on the delivery docket are all included, undamaged and within the scope of delivery. Please contact our Customer Service Department if the delivery is incomplete or damaged.

1.6.3 Transportation damage

The delivery firm is liable for any damage occurring during transportation. A complete report detailing any damage incurred must be submitted to the delivery company which will serve as the basis for a compensation claim.

Any damage or loss of goods delivered by us should be reported immediately and confirmed by a copy of the above-mentioned report.

1.7 SAFETY

1.7.1 General information

The LactoCorder is constructed using state-of-the-art technology and is safe to operate.

The complete device, including individual components, is subject to continual inspection by our Quality Assurance Department.

The LactoCorder® should only be used when in perfect condition and then on correctly in accordance with the operating instructions, while being continually aware of the safety aspects and risks involved!

Correct malfunctions which can adversely affect operational safety immediately (or have them corrected)!

1.7.2 Points of particular importance

Read the operating instructions provided carefully before commissioning the device.

Lack of knowledge concerning operation and care of the device can result in damage to the LactoCorder®.

The operating instructions should be accessible at all times where the device is in use.

Modifications, conversions or additions to the LactoCorder® which could adversely affect safety should not be carried out without the approval of the supplier!

Do not carry out any program changes (software) on programmable control systems!

1.7.3 Selection of operating personnel

Work on the LactoCorder® may only be carried out by well-instructed personnel.

Only employ trained or instructed personnel and establish clear responsibilities for all personnel for operating, setting-up, maintaining and repairing the device.

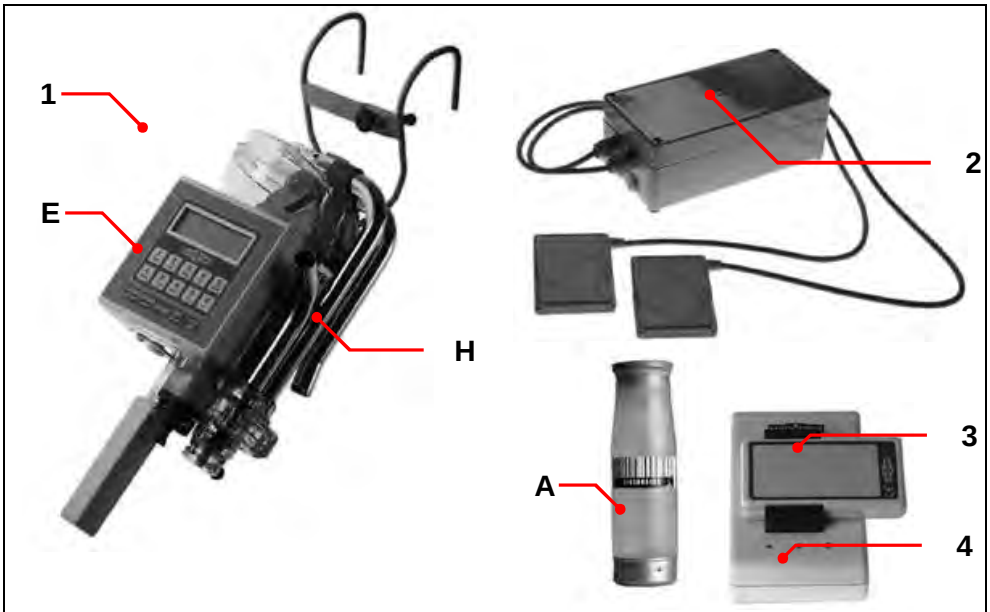
2 THE LACTOCORDER® SYSTEM

2.1 THE LACTOCORDER®

2.1.1 Construction of the LactoCorder®

The LactoCorder® system consists of the following components:

Fig. 2-1, The LactoCorder® system



1	*LactoCorder®* - mobile (battery-operated) electronic milk flow measuring device - diversion of a representative milk sample into a 50 ml analysis bottle (A) - built-in scanner for the sample bottle barcode/transponder - can be used as a data recording device		
2	*LactoCorder® charger (1 or 4 connections)*	**3**	*Datapack (data transfer medium)*
4	*Datapack read/write station for the PC*	**+**	*User PC software (LactoPro))*
E	*Electronic module*	**H**	*Hydraulic module*
A	*Analysis bottle with ID (barcode, transponder*		*Option: portable printer*

The LactoCorder® consists of two main modules, the hydraulic module (H) and the electronic module (E). Measuring is carried out in the hydraulic module through which the milk flows while data is processed and saved in the electronic module. The electronic module also includes the operating panel.

2.1.2 Measuring principle

The LactoCorder® is equipped with a completely new type of patented measuring system: the pulsating milk is transferred directly after milking in a largely separate, calm and gentle manner to the flow meter chamber via the centrifugal head by means of the transport air needed for the milking process. The residual gas in the milk (which is still warm from the animal), which is mostly between 30% and almost 100%, can vary through decisive influences of the milking system, the flow of milk and the composition of the milk.

A probe is fitted in the reservoir chamber (which is situated directly in front of the vertically-located measuring slit) for measuring the height of liquid in the chamber. This consists of a transmitter electrode and 60 individual electrodes, whereby the measuring chamber is divided into 60 equal height layers (each 1.6 mm in height). The electric conductivity is measured of the fluid which is present at any one time between the transmitter electrode and the respective layer electrode at each height level. This value is placed in relation to the electric conductivity of the gas-free milk which is being measured simultaneously. This ratio figure is therefore an exact value of the gas content of the fluid in the respective height layer, being unaffected by the specific conductivity of the milk in question.

A combination of the 60 ratio figures forms a milk density profile which is re-determined every 0.7 seconds.

This system for continually measuring the milk density enables one to log a flow of material (kg/min) precisely with an actual volume meter (l/min) without moveable measuring elements, even with starkly varying foam development in milk which is still warm from the animal, which means to effectively achieve a genuine continuous weighing process.

The following measured variables are, on the basis of this measuring principle, available and are recorded continuously during the entire measuring process:

- milk flow ⇐ the milk yield in kg. or lb. is determined from this
- foamed milk content
- electrical conductivity of the milk

A sensor also logs the temperature of the milk

Each measurement is annotated with the date and time at which the measuring process began using the time-keeping element the LactoCorder® is equipped with.

Analysis of measurements made with the LactoCorder® can be undertaken either for animals or goats. These operating instructions always use the term "animal" except in cases where differentiation is made between the using the device for animal's milk or for goat's milk. One can also alter the display mode to show indicated and printed out values either in kg. or lbs. (0.4536 kg.).

The point in time at which special events took place can also be registered in the measured values; registration of this event marker must

be activated in the service menu. Once activated, the point in time of pressing one of the keys <**1**> to <**5**> is registered in the measured value with a code for each key. However, it is only possible to evaluate these measurements which have been execute with licensed LactoCorder.

2.1.3 Sampling

It is possible to divert a representative milk sample into a normal analysis bottle with a capacity of 50 ml during milking, thanks to the LactoCorder® sampling system.

The integrated barcode/transponder scanner also registers barcode/transponder of the sample bottle and enables its allocation to the respective animal.

Two values affect the sampling valve control system:

- the expected milk yield per animal (related to a single milking session)
- the current milk flow be currently measured in the LC

2.1.3.1 Expected daily milk yield per animal

The expected yield is necessary to obtain an adequate amount of sample despite the broad milk yield spectrum of the animals. The sample volume should not be less than 20 ml (ICAR guideline) and not more than 48 ml.

Sampling, using information about the expected yield, is controlled in such a way as to fill 2/3rds of the sample bottle in cases where milking produces exactly the expected yield. Any deviation in the milked yield from the expected value leads to a corresponding deviation in the sample yield. Details of the expected yield are entered in whole number increments of the weight unit used (kg. or lbs.). This always relates to the daily milking volume. It is possible to enter values of between 2 and 99 kg for animals or 0.8 to 9.9 kg. for goats.

50% of the expected daily yield is drawn on automatically in the LC to control individual milkings. The morning and evening milking sessions can be assessed differently if necessary over operating data.. The selected factor is then valid for all animals in the herd in question.

The expected yield is also saved in the LactoCorder over the operational data for all animals in a herd before the milking process begins (see Chapter 4). But it is also possible to input this directly during milking.

There are two options for adjusting the sample bottle filling volume as a function of the expected yield if so needed:

- Adjustment of devices individually over the service menu.
- Generally, over program parameters (please contact the Service Centre).

2.1.3.2 Example: Expected yield and sampling

	Animal A	Animal B	Animal C
Expected daily yield	16 kg	28 kg	40 kg
Control factor per milking (50 %)	8 kg	14 kg	20 kg
Filling volume of sample bottle corresponding to the control factor	33 ml	33 ml	33 ml
Filling volume as a percentage of the control factor	0.41 %	0.24 %	0.17 %
Filling volume tolerance			
• Lower limit (= -40 %)	20 ml	20 ml	20 ml
• Upper limit (= +45 %)	48 ml	48 ml	48 ml
Tolerance of milked yield:			
• Lower limit: (= expected yield - 40 %)	4.8 kg	8.4 kg	12.0 kg
• Upper limit: (= expected yield + 45 %)	11.6 kg	20.3 kg	29.0 kg

2.1.3.3 The current milk flow

Controlling the valve control system relative to the current milk flow ensures that the sample is always proportionately representative. Accordingly more milk has to be diverted into the sample bottle in the case of a high milk flow level than in case of a low milk flow level.

2.2 BATTERY CHARGER

There are two different designs of mains charging device for the LactoCorder® available: one with one connection and one with four connections. With the latter being made splash-proof.

2.3 DATAPACK

Fig. 2-2, The Datapack

1	*Datapack in its docking station*	**2**	*Datapack in its read/write station*

The DPK serves as a data transfer medium within the system. It can be used to copy data onto or from the LactoCorder®. The data can be any of the following (described in greater detail in Chapter 4):

- operating data
- measurement data
- basic software loaded into the LactoCorder® (measuring program, including the menu program)
- parameters for the basic software

There are three different DPK's used:

- 128 kB with time element
- 512 kB
- 2 MB with time element

2.4 DATAPACK-READ/WRITE STATION FOR A PC (PC INTERFACE)

Fig. 2-3, Read/write station

1	*USB connection*	**2**	*LED (yellow, green, red)*

The read/write station is required to read, delete or describe DPK's via USB-interface of the PC.

The driver installation is effected on the occasion of the installation of LactoPro.(from version 5.2.0).

2.5 PC EVALUATION SOFTWARE LACTOPRO

The PC software (LactoPro) of the LactoCorder®-System has been conceived for the "Windows" operating system. It covers in its basics:

- data transfer PC ←→ DPK
- data storage
- analysis of measurement data, including compilation of a record of the results
- a tabulated overview of the results (screen, printer)
- illustration of milk flow and the electrical conductivity (screen, printer)

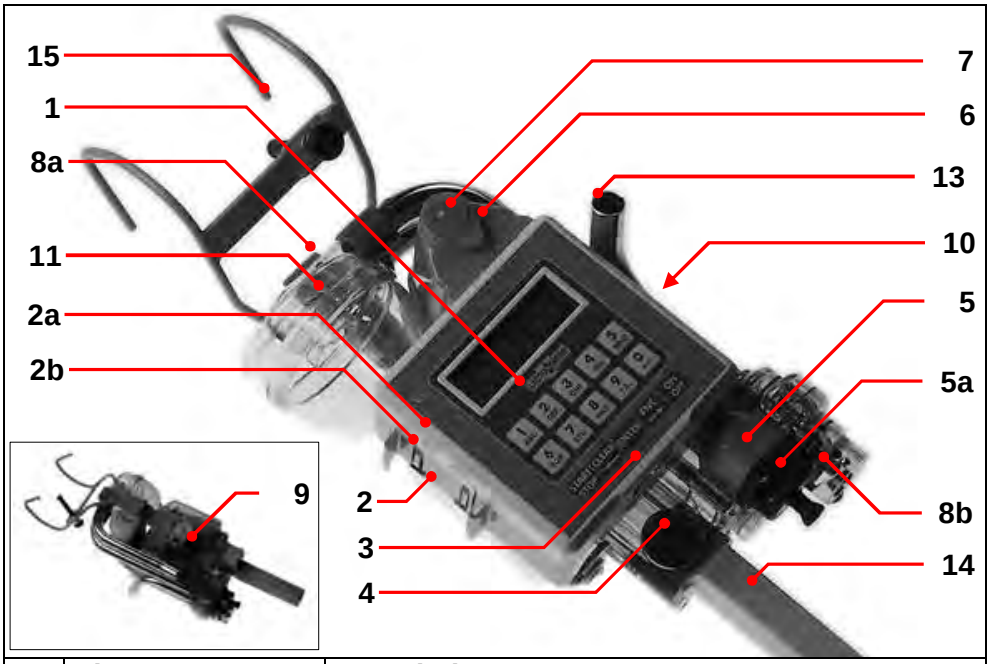
  With the licensed LactoCorder the following supplementary functions are available:
- export to excel of the measuring parameters
- illustration of frothing and temperature (screen, printer)
- cleaning monitoring
- markers of incidents
- copy in special herd/farm

Further functions (see LactoPro)

3 OPERATION

3.1 OVERVIEW OF THE LACTOCORDER®

Fig. 3-1, An overview of the LactoCorder®



No	Element	Description
1	Operating panel	Consisting of: • a display with 4 lines, 20 columns • an alpha-numeric keyboard • function keys
2	Docking station	Attachments for • a DPK (data transfer) • a battery charger
2a	Optical coupler	Data transmission
2b	Sliding contacts	DPK power supply Power input for charging the batteries
3	ID scanner	Reading the ID on the sample bottle
4	Rotary table	Securing sample bottle (Barcode) during identification
5	Sampling socket	Mount for the sample bottle
5a	Stopper	Stopping up the sampling opening when taking measurements without sampling
6	Battery housing	Contains the LC storage batteries
7	Signal lamp	• Milk flow indicator • Warning lamp
8	Switching-over lever	Setting for “Milking“ or “Cleaning“
9	Central nut or Quick release fastener	Opening the hydraulic component
10	Inlet	Connection for milk hose from the milking apparatus
11	Centrifugal head	Transport air separation
12	Bypass	Diversion of separated transport air
13	Outlet	Connection of milk hose to the milk line
14	Handle	
15	Suspension bracket	Hanging and securing the LC (locking pin)

.

	NOTE	**Ensure that the LactoCorder® is fitted as vertically as possible.** **An integrated tilt sensor checks the tilt and a message is indicated if the tilt is outside the tolerance range (see chapter 5.1)**

	NOTE	**The LactoCorder® only causes a minimal loss of pressure (approx. 36% of the ISO norm), thanks to its favourable fluid flow design, and therefore does not have any noticeable adverse affect on the quality of the milking process.**

3.2 FROM SWITCHING-ON TO OBTAINING THE MAIN MENU

3.2.1 Function keys

The function keys in the lower area of the operating panel have the following meaning.

Key	Function	Abbreviation
ON OFF	Switching the LactoCorder® On/Off. • Switching off is only possible in the main menu • The LC will switch itself off automatically if it is inactive for 45 minutes.	-
FNC →	• Paging forward in a list (e.g. herd number, animal number) • Initiation of a sampling cycle outside the sampling period programmed into the operating data (see chapter 5.4.1.1)	<F>
ENTER	Acknowledgement of details in a menu, or "Next", "Continue", etc.	<E>
CLEAR ←	• Springing back out of the current window • Extraordinary exiting of the current window • Correction of an entry if the entry of a value (animal number, expected yield) is expected. • Paging backwards in a list (e.g. herd number, animal number).	<C>
START STOP	Start/finish measuring (currently also partially extraordinary exiting of the current window, if CLEAR ← is not available). The key is blocked for a short time (3.5 sec.) after "Start measuring" has been triggered which prevents the measuring process being accidentally terminated again due to bumping or a similar event.	<S>

3.2.2 Menu sequence

The LactoCorder® is switched on using the ON OFF key.

	NOTE	**Failure to switch on the LC using the ON OFF key could be due to one of the following causes:** **1. The batteries are completely empty (e.g. after been stored for a long time).** **➔ connect up the charger and try again after approximately 15 – 30 minutes (remove the charger beforehand).** **or** **2. The LC was subjected to strong vibration leading breakdown of a safety relay.** **➔ connect up the charger and try again after a few seconds (remove the charger beforehand).**

A sampling valve functionality test is carried out (using an acoustic signal) immediately after the LC is switched on followed by an internal device test (firmware test). Any errors in the stored data (OD, measurement values) revealed through this test are indicated and the faulty values deleted. Successful completion of the device test is displayed in the next window, along with identification of the LC-loaded firmware. An information window subsequently appears showing the following details:

- the date
- the time
- available battery capacity: details given in terms of hours (h) of measuring possible
- available memory capacity (RAM): details given in terms of hours (h) of measuring results storable

The next windows each appear automatically after 5 seconds respectively.

- details of the currently saved herd (name, number, milking time the sample was taken at).
- an information window, e.g. information from the LKV centre (optionally: the contents can be transmitted to the LC via operating data).
- the main menu

These windows can be advanced prematurely by actuating the ENTER key.

If the date or time stored in the internal clock are implausible the false values will be displayed as a reminder that the internal clock needs adjusting. This can be done by loading the OD or in the service menu.

The **main menu** is the starting point for all further functions.

	NOTE	**The LC is also switched off in the main menu (ON OFF-Taste); this also automatically switches the sampling valve into the open position.**

The main menu is divided between two windows and contains the following contents:

```
Milking          <1>
Cleaning         <2>
Data transfer    <3>
Info <4> Cont.   <5>
```

```
Service          <6>
Milk.no herd data<7>
Commander meas.  <8>
Cancel           <C>
```

Milking (see chapter 5)

The menu point “Milking“ serves to record the milk yield, the measuring process and to take a milk sample while using OD.

The sequence within “Milking“ depends on the information in the OD (including the sampling status).

Cleaning

Cleaning program: serves also for cleaning the sampling valve.

Data transfer (see chapter 1)

This menu point serves for

- inputing the operating data from DP and their modification
- inputing program parameters from DP
- saving measuring data to DP

Info (see chapter 1)

This menu point serves for checking and overviewing results (animal number, milk yield) after measuring has been completed.

Service (see chapter 1)

A generally accessible menu which, among other things, offers the following options:

- retrieval of the current LC software version and loading of a new software version
- carrying out tests, such as the sampling valve test or the battery test.
- carrying out adjustments (e.g. date, time, correction of the sample size)

Milking without OD (see chapter 5.5)

A simplified milking menu designed for milking without the use of operating data.

3.3 STORAGE BATTERY

The LactoCorder® is supplied with power by a storage battery (nickel cadmium or nickel metal hydride) with a capacity of 1700mAh until up to 2500mAh enabling measurements to be made for between 14 up to 25 hours.

3.3.1 Battery monitoring

The available battery capacity is shown in “Measuring time available (h)”, whereby this data is based on a consumption forecast. The self-discharge is taken into consideration. However here too it is about an orientation value. The battery charge is displayed as “Measuring time available (h)“ when switching on the LC and when terminating the measuring process. **There is also indication of a lower battery charge level during measuring in the form of one or two rectangles in the right-hand upper corner of the display (< 2 hours, or 0 hours measuring time left).**

An undefined residual capacity can exist for a battery charge display of 0 hours measuring time available, depending on the condition or age of the storage battery. A warning sign will be displayed after each milking if the battery charge sinks to a critically low level. **One should not seek to continue taking measurements if two squares are visible.**

Data will be saved on the LC for at least 14 days after the battery capacity has been exhausted.

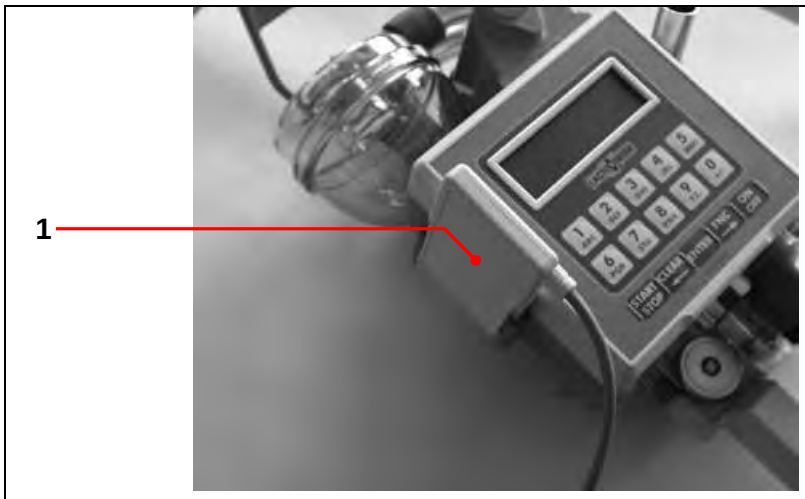
It is not possible to have any pre-warning if there is a sudden power cut (e.g. short circuiting). No milking values will be stored if this occurs during milking.

Storage of LC/Accu for a longer period leads to a loss of battery capacity.

	NOTE	**Always check the battery charge punctually before renewed use after long periods in storage.**

3.3.2 Charging procedure

Fig. 3-2, Charging procedure



1	*LC connection*

The LC connection of the charging device is pushed into the docking station from the front with the LactoCorder switched off and the charger is then connected to the mains power supply. The charging process begins automatically, confirmed by a read-out on the LC display. Complete charging requires 5 to 7 hours. But the actual charging process can be shorter depending on the residual capacity available.

A flashing signal lamp shows when the storage battery has been fully charged and the message “Battery fully charged - remove charger“ appears on the display. The system then switches to trickle charging. No overcharging happens in case the charger remains attached to the LC.

	CAUTION	**The LC should not be connected to each other over the milk or cleaning lines during charging. Do not connect the charger to the LC until this has been ensured.**

	NOTE	**Charging temperature** **Charging of LactoCorder® batteries should be carried out at temperatures between 10°C and 30°C.** **Power absorption drops at higher temperatures.**

3.3.3 Battery Service, taking care of the battery

Tip

Drain storage batteries to a lower level (< 50 %)

It is important to ensure that batteries are drained regularly during practical use to a lower level (< 50%) so as to maintain the battery capacity at a high level over a longer period (the memory effect).

The LC is also equipped with a storage battery care program (battery service) which also helps ensure that the battery will have a long working life.

The operator is automatically requested to activate the battery service every 2 weeks using the START STOP key, which discharges the batteries completely and then recharges them again. This care program takes a maximum of 20 hours to complete. If this time is not available the battery service can be bypassed by pressing the <ENTER> key instead of the START STOP key. The LC then reverts to the normal battery charge but the message reappears for every subsequent charging process until the battery care program is carried out. Not pressing a key will cause battery charging or battery service to commence after 30 seconds..

It is also possible to load the battery service directly:

- connect the charger to the mains power supply.
- maintain the START STOP key in a depressed position while pushing the DP charging connection into the docking station.

Operating temperature

The specified operating temperature of the Ni-Cd and NI-MH storage batteries (as used in LactoCorder®) lies between 0°C and 50°C..

The specified **storage temperature** lies between –20°C and 60°C.

(see also chapter 3.3.1)

3.3.4 Storage battery test

The storage battery test serves to check the condition of the battery and is initiated in the service menu (see chapter 7).

Please note that the test can take up to 27 hours to perform.

The test proceeds as follows:

- Start “battery test“ in the service menu.
- The battery capacity, which has been determined by means of the last battery test, is displayed; continue with ENTER
- A time reading for carrying out the test appears together with the request to plug in the charger.

Connect the charger (attached to mains power supply) to the LactoCorder®.

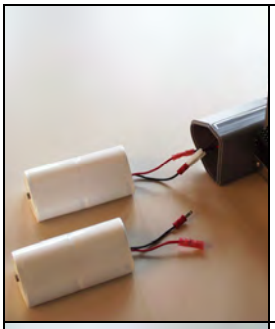
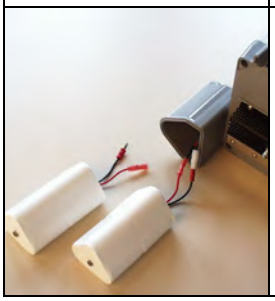
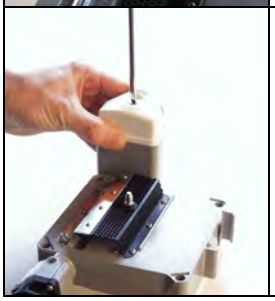
- The storage battery will be fully charged.
- The storage battery is then discharged and the time required to discharge is recorded.
- It is then fully charged again.

The current capacity can be requested by calling up the battery test menu point again.

3.4 CHANGING THE BATTERY

	CAUTION	**The battery cover must be tightened to a torque of 50 Ncm and must rest on the housing without any gap. If this is not the case, the cover must be removed again and the position of the battery cable and battery plug connection checked.**
	CAUTION	**After each changing of the battery and/or non-use of the LC for a longer period (> 2 months) the storage battery test has to be made (see chapter 3.3.4) before using the LC in order to determine the new capacity. The minimum basic charge which is sufficient for supplying power to the data memory and the clock is not sufficient for the milking.**

Proceed as follows in order to prevent any information being lost when changing a storage battery:

	1. Loosen and remove the screw in the battery cover, ensuring that the O-ring (which acts as a sealing element between the screw and the cover) is not lost in the process.		4. **Disconnect the old battery and connect up the new battery immediately within 15 seconds (see note)**
	2. Pull the battery out of the battery shaft well without loosening the electrical plug connection.		5. Push the new battery into the battery well. Ensure that the plug connectors finally rest in the corners between the battery and the battery compartment.
	3. Have the new storage battery ready to install.		6. Replace the battery cover, insert the screw with its O-ring and tighten the screw to 50Ncm using a torque spanner.

Note: Changing battery within 15 seconds

If 15 seconds cannot be observed or in case the capacities of both batteries are different (comparison: battery new / old) a time limit of 10 minutes must be observed before the new battery may be connected. Otherwise measured data, operating data, date, time and battery information as well will be lost. When restarting the LC the following input is necessary: date and time, mAh of battery capacity, animal species and weight unit. Afterwards it is compulsory to carry out a battery test (see chapter 3.3.4).

4 DATA TRANSFER LACTOCORDER® ← → DATAPACK

Data transfer between LactoCorder® and DPK involves the following data:

- operating data
- measurement data
- the LactoCorder® internal basic software (firmware) (milking program incl. menu)
- parameters for the firmware

		The DPK is inserted into the docking station from the front to facilitate data transfer
	NOTE	**Separate DPK should be used for operating and measurement data**
	NOTE	**Only a DP with time-keeping element can be used for operating data. This DP is specially marked with a clock symbol on the front.**
	NOTE	**A DPK with 512 kB is required for the LactoCorder® internal basic software.**

4.1 OPERATING DATA

Operating data consists of order parameters (e.g. the herd number), adjustment parameters for the LactoCorder® (e.g. milking time for sampling) and animal data (ear tag number, stall number or animal number, perhaps the animal's name, expected daily milk yield, lactation status). The function of the operating data is therefore:

- adjustment of the LC to suit the current herd
- updating inventory data
- controlling sampling (see chapter 2.1.3)
- increasing operational precision during measuring since every animal in the herd is stored in the LC with its own number (or name) and its own lactation status.
- comparison of LC time-keeping elements and conversion to summer or winter time.

By means of the operating data editor, which is integrated in LactoPro, operating data can be established and modified.

It is also possible to automatically copy new program parameters into the LactoCorder® while inputting the operating data.

Comparing the time and date between the LactoCorder® and the DPK when inputting herd data means that all LactoCorders® operating in a

given herd have identical adjustments which can be used as a control or correction value (AT method). Thus the herd data can only be entered into the LactoCorder® from a DPK with a time-keeping element.

- transfer of the date and time from the DPK occurs automatically as long as the time difference between the LactoCorder® and the DPK is less than 2 hours. The following warning appears if the deviation is greater:

```
Time difference
LactoCorder/DATAPACK
more than 2 hours
Continue        <E>
```

Pressing ENTER causes the date and time of both the DPK and the LactoCorder® to appear. Decision can be made whether the DPK time should be accepted or not; an example:

```
DP:   24.09.97/11:45
LC:   24.09.97/17:12
Set LC time from DP?
Yes<1>          No<0>
```

- selection **<0>** is made if the DP time and date are not accepted, but the values of the LC are retained because they are correct, otherwise selection <1>**.**
- another security question follows after both selections **<0>** and **<1>** which requires the selection to be confirmed (**Start <E>**) or from which one can return to the selection window.

4.1.1 Inputting operating data and carrying out changes

Operating data is entered into the LactoCorder® before carrying out measuring for a new herd and can at the same time be adapted to suit the current conditions. The following adaptations are possible:

- changing the lactation status (LS)
- changing the expected daily yield
- recording additions to the herd with assignment of an LS
- recording animals leaving the herd

The lactation status indicates the status of the animal in relation to the MYT. The following status codes are defined:

Lactation status	Code
Milk	0
Dry	1
Calf / goatling	2
Animal leaving the herd	4
Nursing/mother animal (MoAnimal)	5
No sample milking (noPM)	6
Churn measurement 1 (1 milking)	7
Churn measurement 2 (2 milkings)	8

Codes 7 and 8 cannot occur in the operating data. They can only be entered during milking.

The ***expected daily yield*** serves to control sampling (see chapter 2.1.3)

	NOTE	**Milking can only be carried out on animals designated with LS "0" (= "Milk").**
	NOTE	**There is an additional option in the milking menu to:** • change the lactation status of animals to "0" • change the expected daily milk yield and • record additions to the herd with LS "0" (see Chapter 4.1.1.4).

Inputting and changing of OD are connected to each other and should be carried out in the milking shed immediately (together with the farmyard manager or milker).

The following steps should be carried out:

- operating data is entered in one LC from the DPK
- here it is modified, and subsequently
- resaved in the same DP.

The operating data updated in this fashion is finally read into the other LCs employed in the milking shed.

	NOTE	**Measurement data saved in the LC must be read out before operating data is entered (see chapter 4.2).** **In a LC the operating data for only *one* herd can be saved at a time.**

4.1.1.1 Accessing the menu

1		1. Insert the DPK with the operating data into the docking station
2	Measure..... <1> Clean..... <2> Data transfer. . <3> Info<4> Cont. <5>	2. Select data transfer <3>. → the transfer menu is activated.
3	DATAPACK Read in from ... <1> Save to ... <2> Back .... <C>	3. Select read in from <1> in the transfer menu.

In case the LC would not have been cleaned after the previous milking the message "LactoCorder has not been cleaned" would now be displayed.

The message "**Datapack being read** " appears.

The identification number and herd name of the last herd selected or updated then appears,

or the identification number and the herd name of the first herd in the DPK if the DP has been newly pre-recorded from the PC using operating data.

The herd is selected if the latter occurs, as described in chapter 4.1.1.3

4.1.1.2 Acceptance of already updated operating data

If the herd displayed is to be accepted along with the updated herd data, confirm this with ENTER .

	NOTE	**The DP notes the last selected herd.** **This simplifies the acceptance of already processed operating data by the other LCs.**

The message “Operation terminated, remove DPK“ appears.

Press ENTER at this point to return to the main menu.

4.1.1.3 Selecting a new herd

1. Select through using the arrow key to the desired herd → the respective identification number and herd name appear.
2. A Herd can also be searched by entering the last three numerals of the herd number. For this purpose the key START STOP is provided.
3. Confirm the herd selection with ENTER then an information (or control) window appears which contains the herd number, milking time for sampling, date of the last MYT and the number of animals in the herd.
4. Continue with ENTER.

If the operating data for the selected herd is based on an MYT which is more than 40 days old, an option is offered automatically to correct the milking time for sampling. The current sample status appears (=milking session for sampling, e.g. “mo“) which can be acknowledged with ENTER. **Selection of <0>** is also possible which will open a window where changes can be carried out. If a change is being made the program moves automatically to “Update operating data“ (see below).

5. The message “**Update operating data?”** follows. To update continue with ENTER (=yes), or exit the menu with <0> (= no) without making out any changes to the operating data. Only a security query follows.

	NOTE	**If the menu point “Update operating data“ is selected, so-called dummy measurement data will be stored in the respective LC at the end of the modification for all animals with LS > 0, and the information about these animals will flow back to the database along with the measurement data via the DPK. No dummy measurement data is stored if updating is bypassed.**
	NOTE	**The dummy measurement data consists of a header with identification data (BNR, CNO.1, CNO.2, LS, date, time etc.) (as is the case with real measurement data), and thus has the same structure as data from “measured“ animals.**
	NOTE	**The date and time in the dummy measurement data will be the time of resaving to the DPK (chapter 4.1.1.5).**

	NOTE	**If an animal with LS>0 is set to LS=0 during milking and measured, both the dummy measurement data and the real measurement data will be accepted, thus resulting in two differing incidents involving the same animal.**

4.1.1.4 Updating operating data

On selecting ENTER the message **Datapack being read** appears.

	NOTE	**Any "anmial number" mentioned in the following is a number with a maximum of 8 digits (generally a stall number) and is equivalent to "Anmial number 2" in the LC operating data.**

1

Afterwards all animals are displayed which have not delivered any measurement data in the previous MYT, i.e. animals with:

Lactation status	..... Code
Dry	1
Calf / Goatling	2
Nursing/mother animal (MoAnimal)	5
No sample milking (noPM)	6

The information displayed can be confirmed with ENTER (= remains) or the lactation status can be changed using **<0>, <1>, <2>, <4>, <5>, <6>**. The next animal then appears.

If **Milk <0>** is selected, which means that this animal should be milked this time, an enquiry will be made afterwards concerning the expected daily milk yield. A subsequent window will also appear with the previous value ("old") and the current value ("new") can then be entered. Confirm using ENTER.

Values from 2 to 99 kg are permitted for the expected daily milk yield, for animals and 0,8 to 9,9 kg for goats.

The program will then automatically move onto a new window once these animals have been processed.

```
Operating data:
More changes     <1>
Chg EY total herd<9>
Stop             <E>
```

From here one can branch out to

More changes <1>
for further animals or, once again, with animals which have already been subject to change ("free animal number selection"), or one can use

Chg EY total herd<9>
to change the expected yield (EY) of all animals in the herd by the same percentage. A window with -30% -20% -10% + 10% +20% + 30% appears in which the desired percentage can be selected. Only the last value selected is valid if this function has been used several times.

Stop <E>
Terminates OD modification.

2a

Selection

More changes <1>
This can involve the following cases:

- additions to the herd
- animals which were checked during the last MYT, but not during the current MYT (e.g., now dry)
- animals which were checked during the last MYT, but where a change in the expected daily milk yield must be undertaken.

If a “animal number 2“ (stall number) appears twice or several times, the identity of the animal can be checked unequivocally according to its ear tag number. An additional window is displayed in which the animal can be selected on the basis of the ear tag number (ID number).

No more than 4 animals can be listed with the same stall number (CNO.2)

Example:

```
Multiple      animal
ID no. 0009 123
153  ROSANA 30kg
Cont.<1>  OK<E> <C>
```

Continue <1> means that the next animal with the same entered number (here “153“) can be retrieved using key <1>.

OK <E> means that the animal displayed will be selected with ENTER.

<C> CLEAR triggers a return to the animal number input mask.

An informative display appears in the first line of the display after a **animal number** has been input and confirmed with ENTER showing the:

- animal number
- the expected daily yield (or the lactation status code) if the animal registers a lactation status > 0.

The following selection options are available:

```
ExpYld.          <0>
Drv              <1>
Calf             <2>
Removd           <4>
MoAnimal         <5>
NoMRec           <6>
Back             <C>
```

Selection <0>: for LS = 0: the expected daily yield can be changed

The previous value ("old") appears in the next window and the current value ("new") can be entered. Confirm with ENTER.

The daily yield for cows must lie between 2 kg and 99 kg while that for goats must lie between 0.8 kg and 9.9 kg.

Selection of <0> (for LS = 0), **<1>, <2>, <4>, <5> or <6>:** the respective lactation status is stored

Selection of <C>: on pressing the CLEAR key the program returns to animal number input so nothing was changed for the last animal selected.

2b

Selection

```
Stop             <E>
```

There is only a security question if no changes were made but the question **"Save to DPK?"** will appear if changes have been made. The options described in Chapter 4.1.1.5 are now available.

4.1.1.5 Terminating making changes to operating data

Operating data changes are terminated by entering

```
Cancel         <S>
```

in the animal number input window.

The program moves to a new window which offers the selections

```
More changes     <1>
```

(see above) and further changes can be made or

```
Chg EY total herd <9>
```

the expected yield of all animals in the herd can be changed by the same percentage (see also 4.1.1.4) or terminate operating data modification with

```
Stop             <E>
```

Selection "Stop"

```
Stop             <E>
```

The question **"Save to Datapack?**" appears where the following options are available:

Yes <E>

Changed data is saved to the DP. The message **"Operating data are being saved to DPK. Please wait"** appears.

	NOTE	**The DPK should under no circumstances be removed from the docking station while the operating data is being saved from the LC to the DPK, otherwise the operating data will be irretrievably lost.**

Finally, the message **"Saving to DP complete. Remove DPK"** appears. The DP can now be removed from the docking station and one can return to the main menu with ENTER.

No <O>

no saving, the entered changes are lost. A security question appears.

Back <C>

the program returns to animal number input where it is possible to carry out further changes (equivalent to the selection "Further changes" (see above)).

4.2 SAVING MEASUREMENT DATA TO THE DATAPACK

Measurement data from all LC employed in a given herd is saved to the same measurement data DP. A second DPK can be employed if one DPK does not have sufficient capacity.

1

1. Insert measurement data DP into the docking station

2

```
Measurement..... <1>
Cleaning......   <2>
Data transfer. . <3>
Info<4>    Cont. <5>
```

2. Select data transfer <3>.
   → transfer menu is activated

```
DATAPACK
```

3. In transfer menu:

3	**Read in from ... <1>** **Save to ... <2>** **Back .... <C>**

Select "Save to "<2>".

The message "**Measured values being saved, please wait**" follows.

	NOTE	**The DP should under no circumstances be removed from the docking station while the measurement data is being saved to the DP, otherwise the DP data will be irretrievably lost.**

If the measurement data has already been read out then it will be displayed and the data transfer can be terminated with key **<2>** or read again with key **<1>**.

The message "**Measurement data saved to DP, please remove DPK**" appears after the copying process has been completed.

Now remove the DP and return to the main menu with ENTER

	NOTE	**If measurement data has previously being saved from the LC to a DP it will automatically be erased during the next measurement session, but can be read as often as needed until then.** **However, a message appears to state that the measurement data has been read out before, thus preventing any repeated accidental reading of a LactoCorder®.**

4.3 LOADING THE FIRMWARE INTO THE LACTOCORDER®

The LactoCorder® has the option to simply load its internal basic software, which primarily consists of the measurement program and the menu guide, from the DPK and thus to renew itself (see chapter 7.4)

	NOTE	**The version numbers of the basic software can be retrieved as follows:** **In the main menu select first continue <5>. then service <6>.** **Select LactoCorder® info <1>:** **The LactoCorder® info will be displayed**

5 MEASURING

The LactoCorder® menu offers two options for taking out measurements: measuring with operating data, measuring without operating data.

- Main menu

```
Milking          <1>
```

The "Measuring" referred to in this menu is intended for routine use of the LC during the milk yield test (MYT). Operating data must be saved in the LactoCorder® (see chapter 1).

- Main menu (2nd page)

```
Milk. no herddata   <7>
```

The "Measuring without OD" in this menu is intended for testing or similar purposes. Operating data (OD) is not required (see chapter 5.5).

5.1 GENERAL INFORMATION

The following points apply to both of the two measurement options (with or without operating data).

Installation of LC in milking plant

Effective measurement is not possible if the LactoCorder® is tilted too much (> 14°), and the following message appears when the measuring menu is accessed:

```
Inclination exceeds
permissible limits
Put in vertical pos!
Continue         <E>
```

The LC should be adjusted into a completely vertical position. The above message vanishes when the deviation from the vertical is small enough; the measuring menu then continues.

One can return to the main menu by pressing ENTER.

Measuring will not be interrupted if the tilt tolerance is exceeded during the measurement. A code will, however, be entered in the measurement data for checking purposes and a message box is displayed in regulars intervals during the measurement if the tilt tolerance is exceeded over a period of > 30 seconds (parameter “NG“).

Marker

During each milking particular incidences and observances can appear, which influence the milking attitude adversely. These incidents can be registered by a marker with a key on the LC keyboard. Totally 5 different markers (key 1 to 5) can be set each milking. These markers will be

shown in the graph of the evaluation software LactoPro by a dash line and the relative key number.

5.2 SWITCHING OVER TO “MILKING”

Fig. 5-1, Milking

The LactoCorder® must be set to “Milking” before measuring commences. One must ensure that

- the lever on the LC inlet (8a) is at “M” (=milking position; black dot S),
- the lever on the LC sump (8b) is in the “milking”-position,
- the sampling equipment (5) is closed (put in plug (5a) or sample bottle in place).

An instruction appears to ensure this, telling one to check whether the LC is in the milking position. The program will only continue after the displayed numbers have been entered (a random number).

After measuring has been completed the LactoCorder® must be switched back to “Cleaning” again and the cleaning program activated (see separate instruction cleaning monitoring).

5.3 STARTING MEASURING ACCORDING TO THE MILK FLOW

The starting point for measuring is **dependent on the milk flow**. The process is as follows:

- Confirming the animal number with START STOP causes the LC to switch to measuring mode (the message “Measuring” appears and the signal lamp flickers) and to immediately begin to record the milk flow and the temperature.
- As soon as a milk flow of 200 g/min with cows and 100 g/min with goats is exceeded three times the previous 30 seconds (maximum) of measurements are saved and further measurements are taken from

this point. The display switches simultaneously to the measurement indicator display with its large numbers and the signal lamp goes out.

- A correction option using CLEAR is available (animal number, expected daily milk yield, churn measurement) as long as the signal lamp flickers. Measurement data which was recorded before “Correction <C>” was actuated is erased.
- There is also an option to trigger actual measuring in “Measuring” mode independently of exceeding the minimal milkflow value by again pressing START STOP. The previous 30 seconds (maximum) of measurements are again saved. Please note that the start key is blocked for 3.5 seconds after this actuation.
- There is an irregular situation existing if the signal lamp goes out instead of flickering after confirming the animal number by START STOP, which generally requires additional entries to be made (a non-registered animal, animal already measured, animal with LS <>0).

5.4 MEASURING USING STORED OPERATING DATA

Only data can be measured for animals which are stored in the operating data with the lactation status number zero (= “milk”). Animals with the lactation status “Dry”, “Calf”, “Nursing/mother animal”, “No sample milking” cannot be measured. It is, however, possible to change the status while measuring so that measuring becomes possible. Even an animal which is not contained in the OD can be registered provisionally with LS=0 and then measured.

Recording a tank sample

The LactoCorder® also offers the possibility of recording the ID on a sample bottle with a tank sample - e.g. for measuring the ingredients in the entire herd’s milk yield (e.g. urea) -, even if the LactoCorder® is set to “Measuring without sampling” .For this purpose the animal number “000“ is entered in the milking menu and stored together with the ID number of the bottle (dummy measurement data).

Churn measurements

It is possible to register the milk yield from churn measurements in the LactoCorder which involves triggering measuring for a normal measuring process by entering the animal number but then interrupting it after approximately 2 seconds by pressing <**C**>. The window which now appears has, among others, the selection “**Churn animal <1>**”. Pressing <**1**> causes a window to appear in which the milk yield can be inputted and a selection concerning whether one or two milking are to be carried out. A new animal number will be requested once these entries have been made.

Animals with identical stall numbers

The animal number to be entered in the display should not have more than 8 digits. It relates to a stall number which is stored in the

measurement data and the record of results (see program LactoPro) under “CNO.2”. “CNO.1” contains the official ear tag number and is to be included to allow unequivocal identification.

- If an entry or stall number (CNO.2) arises several times the respective animal can be selected from the additional overlaid window by means of the ear tag number (CNO.1). A maximum of 4 animals with the same stall number (CNO.2) can be processed at any one time.

Example:

```
Multiple anim.number
ID/N. 0009 123 45678
153    ROSANA  30KG
CONT.<1> OK<S>  <C>
```

Continue <1> means the next animal with the same input number can be retrieved with key <1> (here “153”).

OK <S> means that the animal displayed can be selected using the START STOP key

<C> means one can return to the animal number input mask using the CLEAR key.

The menu sequence in the measuring menu differs somewhat depending on the settings which are made via the operating data.. The following setting options are possible:

- sampling status (milking time with or without sampling)
- sample-ID (barcode/transponder recording or manual inputting of a bottle or position number.)
- point in time of entering the place number
- large digits for flow or yield while measuring

5.4.1 Measuring with sampling

The following option is taken into account:

- recording of the ID code of the sample bottle (barcode or transponder).

Program step	Explanation
Identification of sample bottle (barcode or transponder)	• Position bottle on magnetic rotary table and turn freely; at least 3 revolutions are required for barcode recording. • Put bottle with transponder to the bottom side (by the window) for reading the ID • The ID can also be typed in as an alternative • If the ID is not read immediately a new window appears automatically after 30 seconds where you are asked to repeat the reading or to terminate the measuring mode.

<table>
<tr><th>Program step</th><th>Explanation</th></tr>
<tr><td>Connect sample bottle</td><td>

Remove previous sample bottle
Push new sample bottle onto sampling mount from below. The seam of the bottle must clinch into place and seat solidly to the socket.

</td></tr>
<tr><td>Input animal number and activate measuring sequence

Once one confirms using START STOP, the following 5 differences exist:</td><td>
<pre>Input Nr .
O animal .
S:Start .
E:End .</pre>

A maximum of 8 digits are permitted
Correction of the animal number using the CLEAR key: always cancels the last digit (only possible before confirming with START STOP)
The animal number is confirmed using the START STOP key and data measuring is activated at the same time. The signal lamp flickers continuously or blinks to signalise an input error (already milked, animal with LS>0, a unregistered animal).
One can also quit animal number entry from this window by pressing the ENTER key.

1. The animal number is stored in the operating data with LS=0:
The signal lamp flickers and the following display appears:
<pre>237 Heidi
Exp.yield/day 30 kg
Logging running .
Corrections <C></pre>

A correction window can be opened here by pressing CLEAR (churn measuring, new animal number or expected daily yield).
If a milk flow of 100(goats) or 200(cows) g/min is exceeded on 3 consecutive occasions, the measurement data display appears and the signal lamp goes out. The measurement data display shows the current milk flow in large numbers on the left side and the milk yield (depending on the LC adjustment). The animal number appears on the right side, along with the accumulating milk yield (or the milk flow “MF” (in kg/min)) and the measuring termination instruction “Stop” <S>.

2. The animal number is stored in the operating data with LS >0 (e.g. dry):
The signal lamp blinks and the following display appears:
<pre>237 Heidi</pre>
</td></tr>
</table>

Program step	Explanation

```
Dry
Start (EY=20kg)  <6>
Corrections      <C>
```

- The details can be confirmed by pressing <**6**>. The LS for this animal is provisionally set to 0 and the animal is measured. The signal lamp flickers continuously.
- A correction window can be opened here by pressing CLEAR, in which
  - a new animal number can be entered, or
  - an expected daily yield can be assigned to the animal, as the animal is no longer “dry”. It is then automatically assigned LS=0. Continue as described under "1".
- Whether there is no entry inside of the first 10 seconds then the further process is as though the key <6> would be pressed and an expected milk yield of 20kg would be entered.

3. **The animal number is <u>not</u> stored in the operating data:**

The signal lamp lights and the following display appears:

```
Animal num. 55     .
not registered!
Register now     <6>
Corrections      <C>
```

One can return to the animal number input mask using CLEAR **.**

The animal can be registered as “an addition to the herd” using <6> and an expected yield (daily milking yield) can be entered.

4. **The animal was already measured by this LC**:

The signal lamp blinks and the following display appears:

```
2              Heidi
already milked
Repeat milking   <6>
Corrections      <C>
```

Repeat milking <6> if the first measurements were not taken on the correct animal, or

Corrections <C> if a new animal number should be entered.

Program step	Explanation

	5. **The input number arises several times in the herd**
	The signal lamp blinks and the following display appears:
	`Multiple anim.number`
	`ID/N. 0009 123 45678`
	`153 ROSANA 30KG`
	`CONT.<1> OK<S> <C>`
	The next animal with the same input number can be retrieved with **Continue <1>** . Identification is based on the ear tag number and the desired animal can then be retrieved with START STOP.

Stop measuring	Measuring is only terminated if the LC is emptied, i.e. according to the following procedure: • remove the milking equipment and briefly aerate the junction piece. • wait until the milk flow indicator (under a vacuum) drops below 100/200 g/min (after approx. 5 seconds) → the signal lamp flickers. • press the STOP button START STOP The measuring stop display appears with the milk yield in large numbers on the left half of the display and the animal number and highest milk flow (HF) on the right half. The end display is inanimate for 2 seconds The following selection options are available after leaving the end display: • **`Stop measuring <E>`** : Measuring can be terminated by pressing ENTER and it can be switched over to the cleaning menu (all animals have been milked)
Stopping the measuring process	After selecting **`Stop measuring <E>`** an instruction window appears (battery status, switch-over to cleaning), including a security question. After this window has been acknowledged the program stands in the cleaning menu (see separate instruction cleaning monitoring)

The following enquiry appears after every correction before inputting the animal number when measuring with sampling, which requests that the animal number be entered anew:

```
New sample ID ?

Yes              <E>
No               <0>
```

Yes <**E**> Menu goes to the “Read ID” window

No <**0**> Menu goes to the animal number input mask, last bottle ID is saved

5.4.1.1 Changing the sampling time

There is a special case involving measuring with sampling outside the sampling time specified by the operating data. This is achieved as follows:

The FNC key is pressed twice before entering the first digit of the animal number and the indicator begins to blink to acknowledge this. The animal number is now entered, the indicator ceases to blink once this number is confirmed and a normal measuring sequence begins. A request is made to identify the sample bottle once the measuring sequence ends either by reading in the ID or by typing in the number on the keyboard. This is simply a shift in the point in time when the sample bottle is identified compared to normal measuring with sampling from before entering the animal number to after the milking has finished.

5.4.2 Measuring without sampling

Program step	Explanation
Input animal number and activate measuring sequence Once one confirms using START STOP the following 5 differences exist:	Input Nr . O animal . S:Start . E:End . • A maximum of 8 digits are permitted • Correction of the animal number using the CLEAR key always cancels the last digit (only possible before confirming with START STOP) • The animal number is confirmed using the START STOP key and data measuring is activated at the same time. The signal lamp flickers continuously or is blinking to signalise an input error (already milked, animal with LS>0, a unregistered animal). • One can also quit animal number entry from this window by pressing the ENTER key. **1. The animal number is stored in the operating data with LS=0:** The following display appears an the signal lamp flickers: 237 Heidi . Logging running . Corrections <C> • A correction window can be opened here by inputting CLEAR (animal number, end measuring sequence). • If a milk flow of 100/200 g/min is exceeded 3 consecutive times a measuring display appears, showing the current milk flow in large numbers on the left side and the milk yield

Program step	Explanation
	(depending on the LC adjustment). The animal number appears on the right side, along with the accumulating milk yield (or the milk flow "MF" (in kg/min)) and the measuring termination instruction "Stop". The signal lamp goes out.
	2. The animal number is stored in the operating data with LS>0 (e.g. dry):
	The signal lamp blinks and the following display appears:

	`237 Heidi`
	`Dry .`
	`Start <6>`
	`Corrections <C>`

	• The details can be corrected by pressing <**C**>. A new animal can then be entered.
	One can begin measuring by entering <6> if the animal is no longer "dry". It automatically receives the LS=0. Continuation of the process is as described under "1".
	• Whether there is no entry inside of the first 10 seconds then the further process is as though the key <6> would be pressed.
	3. The animal number is <u>not</u> stored in the operating data:
	The signal lamp flashes and the animal number and the message "not registered" appear.
	One can return to the animal number input with CLEAR or the animal can be recorded as "an addition to the herd" with <**6**> as LS 0. Continuation of the process is as described under "1". The signal lamp goes out.
	4. The animal was already measured by this LC:
	The signal lamp flashes and the following options are shown on the indicator:
	`Repeat milking <6>` if the first measurements were not taken on the correct animal, or
	`Corrections <C>` if a new animal number should be entered.
	5. The input number arises several times in the herd
	The next animal with the same input number can be retrieved with `Continue <1>`. Identification is based on the ear tag number and the desired animal can be retrieved with

Program step	Explanation
	START STOP
Stop measuring	Measuring is only terminated if the LC is emptied, i.e. the following procedure must be followed: • remove the milking equipment and briefly aerate the junction piece. • wait until the milk flow indicator (under a vacuum) drops below 100/200 g/min (after approx. 5 seconds) → the signal lamp flickers. • press the STOP button START STOP The measuring stop display appears with the milk yield in large numbers on the left half of the display and the animal number and highest milk flow (HF) on the right half. The end display is inanimate for 2 seconds The following selection options are available after leaving the end display: • **`Stop measuring <E>`**: Measuring can be terminated by pressing ENTER and it can be switched over to the cleaning menu (all animals have been milked).
Stopping the measuring process	After selecting **`Stop measuring <E>`** an instruction window appears (battery status, switch-over to cleaning), including a security question. After this window has been acknowledged the program stands in the cleaning menu (see separate instruction cleaning monitoring)

5.5 MEASURING WITHOUT STORED OPERATING DATA

A simplified form of “measuring” is available for test measurements and in similar cases where operating data is not required. Since any operating data present could be destroyed through "Measuring without operating data", this mode is only selectable when operating data is present when the DPK is inserted. This prevents accidental call-up of this function and the associated destruction of OD stored in the LactoCorder®.

Instructions concerning "Measuring without stored operating data" see separate short instructions LactoCorder®.

6 INFO

This menu point serves to overview and check results after taking of measurements with OD.

An overview of the measurements is generated form the data in a DPK of the entire farm. This overview is possible and can be repeated as long as the DPK has not yet been read out by the program LactoPro.

Up to 580 animals can be processed under Info. It should at the same time be noted that the same animal will be counted twice if it appears with 2 different lactation codes.

6.1 OVERVIEW OF RESULTS

After having selected “INFO<4>” in the main menu the name of the farm, farm number and the accumulator reserve are displayed. The next window shows the sampling according the OD. Afterwards the content of the DPK is imported. When the reading in transaction is completed this display appears.

```
Display          <1>
Printer          <2>

Cancel           <C>
```

6.1.1 Display (Selection <1>)

In the main menu results of single animals or all of them can be shown one after another. The following window appears:

```
One  animal      <1>
All animals      <2>

Cancel           <C>
```

- Selection

```
One    animal    <1>
```

After the entry of the CNO2 the results of the animal with this CNO2 is showed.

```
Enter  animal  number
     23
Confirm          <E>
Cancel           <S>
```

Via pressing START STOP the menu window “Display/Printer” will be showed again.

By means of the entry of CNO2 the results of a single animal can be accessed. Following is showed: Animal number 1 (CON1), the last four

figures from animal number 2 (CON2), amount and number of milking measurement at evening (E) and morning (M), e.g.:

```
        16       0016
E    2.4kg     1 milk
M       kg     0 milk
                 <E>
```

Whether in a milking time several milking of the same animal are found (e.g. due to mix-up) then the sum of the amount and the number of milking are displayed.

- Selection

```
All animals      <2>
```

At first the window is displayed for selection the criteria of animals.

```
Animals  LS<>0    <1>
LS=0, no milking  <2>
Anormal milkings  <3>
Normal milk       <4>
```

<1> shows the animals without sample milking with its lactation status in succession

<2> shows the animals with status sample milking which have no milking existing from in succession

<3> shows the data of animals with more than one milking in a milking time

<4> shows the data of normal milked animals

<C> goes back to the previous window “One animal / All animals”

6.1.2 Printer (Selection <2>)

By means of using this function a report printout can be made via printer which is connected with the LC serial interface on the docking station.

The printer needs following properties: serial interface with 9600 baud, 8 bits und 1 Stop-Bit, Xon-Xoff

The following message appears:

```
Remove DATAPACK
Connect Printer
Continue          <E>
Cancel            <C>
```

<C> goes back to the previous window

<E> opens das following window:

```
Printer test      <1>
Print data        <2>

Cancel            <C>
```

<1> activate a print of a line: "******LactoCorder******"

This function serves as a control of the connection to the printer.

<2> prints the data of all animals in order

- animals with LS <> 0
- animals with LS = 0 without milking
- animals with abnormal milkings
- animals with normal milkings

7 SERVICING

The servicing menu is located in the second window of the main menu and is opened with <**6**>. It has the following structure:

```
LactoCorder Info  <1>
Adjustments       <2>
Tests             <3>
Cont. <E> Cancel <C>
```

```
Load new program <4>
Clear data RAM   <5>
Battery dates    <6>
Cont.<E> Cancel  <C>
```

```
Error memory     <7>
Time / Date      <8>
Activate Telepack<9>
Cancel           <C>
```

Back <**C**> brings you back to the main menu; Continue <E> serves to change windows.

7.1 LACTOCORDER® INFO

The following can be displayed:

- date and time
- available battery capacity: details given in terms of hours (h) of measuring possible
- available memory capacity: details given in terms of hours (h) of measuring results storable
- device number
- software version of the LactoCorder® basic program
- hardware-version of printed circuit boards A and C
- operating data format (HD)
- cleaning monitoring data format (CH 5)
- battery rating (mAh)
- version of software parameters from EEPROM A and C
- animal species (cow / goat)

7.2 ADJUSTMENTS

The following adjustment options exist:

Adjustments II <1>
Submenu with further adjustments, see chapter 7.2.1

Display contrast <2>
The contrast of the display can be reduced (less <1>) or increased (more <2>) here.

Corr.sample size <3>
This is used to change the expected yield-relevant filling amount of the sample bottle (presently 33 ml) by +/- 15 ml. The minus sign is created by pressing the “0“key. It is necessary to input “-0” to correct to “0”, i.e. “0” must be pressed twice.

HMF / DMHG <4>
Following display for the measurement can be selected: maximal milk flow or average milk volume per minute

Weight unit <5>
Selection of the displayed weight unit during measuring: kilogram or pound

Species <6>
Entry cows or goats, the adjustment of species can take up to one minute.

Evening milking <7>
In this menu item the point in time which divide morning and evening is defined. During the measurement with OD this value can be changed. However, a modification of this value is not possible when OD’s have been read in the LC. In this case modifications can just be carried out in the OD’s themselves.

7.2.1 Adjustments II

Lacto-Pro Liz <1>
Manual entry of the licence expiry date

End of milking <2>
Enter the amount of zero milking, is this value being achieved the measuring procedure is ended.

Ext. marker on <3>
Switching-on of extended markers via optical interface

Accu capacity <4>
Enter of the accumulator rating

7.3 TESTS

The following tests or checking options are available:

Tests II <1>
Submenu with further tests, see chapter 7.3.1

Test battery <2>
The battery test serves to check the condition of the storage battery (see chapter 3.3.4).

Test inclinometer<3>
The tilt of the device can be checked but one should note that the tilt sensor is fitted in such a way that it records both the levels “front/back” and left/right” together.

Test DPK interf <4>
Communication between the DPK and LC can be checked. The memory size and the DPK manufacturer number of an inserted DPK are read and displayed.

Test bott.reader <5>
The transponder/barcode-reader can be checked. The transponder/barcode of a sample bottle can be read and displayed.

Test keybd/displ.<6>
The functionality of the individual display cells and the individual keys on the keyboard can be checked using this menu point. The test can be terminated if the same key is actuated twice in succession.

Conductivity/Temp<7>
Milk temperature measurement (minimum 27°C) and conductivity measurement

Echo Test <8>
Only in coherency with Commander

Analyse meas.syst<9>
Checks the measuring point and signals failures. Therefore the LC needs to be filled up with liquid as far as the measuring point 50. The 40 lowermost measuring points are being measured and the following values indicated:

- a) middle measurand (sum of the measurand / 40)
- b) maximal measurand in % of the average
- c) second lowest measurand (the lowest is possibly a defective measuring point

Whether no measuring point is <90% the three above-mentioned values a,b,c will be indicated. If measuring points <90% of the average are available the number of measuring points with measurand <90% of the average will be indicated instead of the value c.

7.3.1 Tests II

`Test valve <1>`

The sampling valve can be actuated for three different time intervals one after the other. Key <S> switches over to the next interval and <S> stops the test after the third interval.

7.4 LOAD NEW PROGRAM

`Load new program <4>`

	CAUTION	**The software must be loaded exclusively on dry LactoCorder® (measurement chamber, interior) at a room temperature of 20±5°C. These equal terms apply also for the first starting of the LC after the loading process.**

This menu point serves to load new LactoCorder® software from the DPK (512kB). The menu point only reacts if the relevant DPK is already inserted. A security question subsequently appears, asking whether the previous version can be replaced.

Software parameters are simultaneously accepted if they are on the same DPK which means that two separate DPK are not required.

One should ensure that the storage battery has sufficient charge in it before loading the new software.

Measurement data which might still be on the LC are deleted through loading (a security question appears first).

Loading takes about 2 minutes with the signal lamp flashing during loading. The LC then switches itself off automatically once the program has been loaded. An internal device test takes more time than usual when it is switched on for the first time.

The program and parameters are copied to the DPK using the program LactoPro (menu “Utility”).

7.5 CLEAR DATA RAM

`Clear data RAM <5>`

The data memory on the LC can be completely erased using this menu point. Examples applications are:

- cancelling test data
- removing faults such as errors in the data memory manager (e.g. obtaining the message “Please save measurement values to DPK first” although no data are available or have been recognised).

Access to this menu is protected to avoid the possibility of accidental deletion. To open the menu,

- a DPK must be inserted in the docking station, otherwise the menu will not be opened.
- a password must be entered which, at the present time, corresponds to the first 6 digits of the LactoCorder® software version. This can be retrieved via menu “LactoCorder® Info“ (see chapter 7.1). Software version descriptions may include also letters instead of figures. The entry of letters goes as follows: On each pressure key one figure and three letters are labelled. To enter e.g. an “F” the key “2” has to be pressed at first and then three times the “FNC key” because “F” the third letter is on key “2”.

7.6 BATTERY DATES

```
Battery dates    <6>
```

This menu point triggers a display which shows the date of the last storage battery operations (charging, battery servicing, battery test).

```
Dat.batt. Chg/Tst/Svc
T10.02.09 S14.02.09
L18.02.09 L16.02.09
L15.02.09 S12.02.09
```

T shows the date of the last battery tests, **S** the last battery service and **L** the dates when the battery was charged. A **?** is displayed instead of a date if there is no valid date available. The battery test and battery service are always located on the second line while the last four battery operations are in lines 3 and 4.

7.7 ERROR MEMORY

```
Error memory     <7>
```

This menu point triggers a display which shows the date of the last error messages.

```
Error memory      <E>
84  21.02 16:34    00
32  04.03 09:55    00
60  05.03 11:00    00
```

This menu window shows on each line the error message number, the date, time and the battery charge in h.

As this information may not be accessibly for everyone the entry of this menu item is protected. To gain access

- a DPK must be inserted in the docking station, otherwise the menu will not be opened.
- a password must be entered which, at the present time, corresponds to the first 6 digits of the LactoCorder® software version. This can be retrieved via menu “LactoCorder® Info“ (see chapter 7.1). Software version descriptions may include also letters instead of figures. The entry of letters goes as follows: On each pressure key one figure and

three letters are labelled. To enter e.g. an “F” the key “2” has to be pressed at first and then three times the “FNC key” because “F” the third letter is on key “2”.

7.8 TIME / DATE

Time/date <8>

This adjustment is intended for users who are working without operating data. When using operating data, the time and date of the LactoCorder® are automatically adapted during data transfer (operating data DPK with a time-keeping element).

Access to this menu is secured as follows to prevent manipulation of the date and time:

- a DPK must be inserted in the docking station, otherwise the menu will not be opened.
- a password must be entered which, at the present time, corresponds to the first 6 digits of the LactoCorder® software version. This can be retrieved via menu “LactoCorder® Info“ (see chapter 7.1). Software version descriptions may include also letters instead of figures. The entry of letters goes as follows: On each pressure key one figure and three letters are labelled. To enter e.g. an “F” the key “2” has to be pressed at first and then three times the “FNC key” because “F” the third letter is on key “2”.
- After confirmation with the “<E> key” the current values (Date/Time) can be inputted.

7.9 ACTIVATE TELEPACK

Activate Telepack<9>

Switch on the current supply for the Telepack; in coherence with Commander only.

8 MAINTENANCE / CLEANING

	CAUTION	**One should generally never use detergents or agents containing detergents on the LactoCorder® (danger of destroying it!)**

8.1 INSTRUCTIONS FOR TAKING CARE OF THE INSTRUMENT

The following Instructions for taking care of the instrument should be observed to preserve the functionality of the LactoCorder®.

- carry out the battery care program regularly
- clean the interior with the cleaning machine after taking measurements (see separate instruction: cleaning monitoring)
- smear the sump rotary valve periodically with perfluorinated instrument grease, or when it is stiff
- it is recommended that that all rubber parts and O-rings be replaced annually or after 1500 operating hours (see Repair and Spare Parts Catalogue)

8.2 CLEANING THE INTERIOR

The patented construction of the LC ensures high turbulence of the cleaning fluid, as is required for effective cleaning.

The LC is integrated in the cleaning circuit of the milking shed's own cleaning machine and set to “Cleaning” to clean the interior (together with the milking equipment).

Fig. 8-2, Cleaning

The following must generally be undertaken before commencing cleaning of the LactoCorder®

- the lever on the LC inlet (8a) must be turned to a slanted position, away from “M” (=milking position; black dot S),
- the lever on the LC sump (8b) should be brought into the horizontal position (“C” = cleaning; red point),
- the sampling equipment (5) is to be closed (insert a sample bottle; plug (5a) can be inserted if necessary).
- the valve cleaning program should be in the stand-by condition (see below).

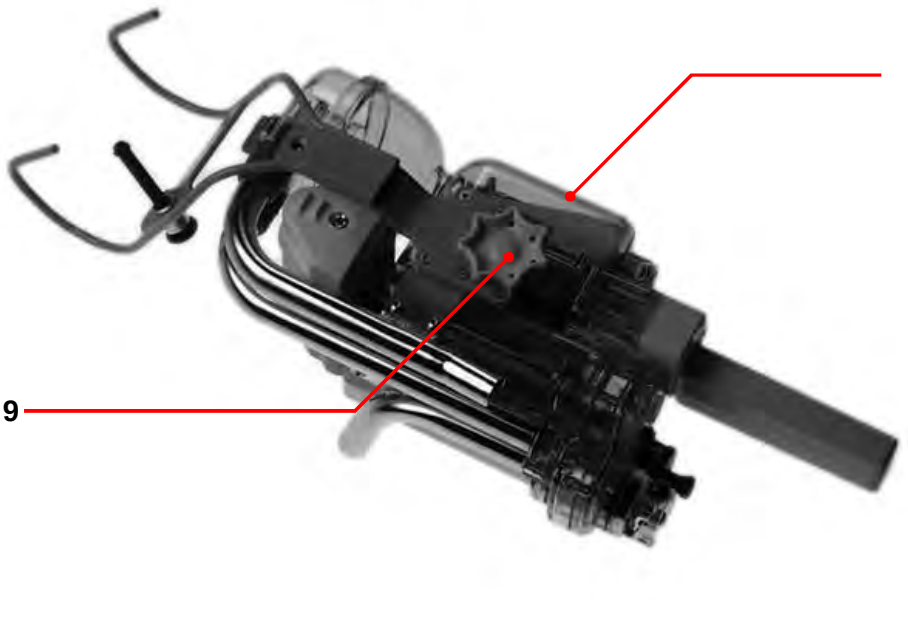
On leaving the measuring menu the user’s notice is drawn to fact that the LC must be brought into the “Cleaning” mode.

	CAUTION	**The valve cleaning program must always be used even when no samples have been taken otherwise there is a danger of milk residues accumulating in the valves area (germs).** **Cleaning should be carried out using a commercially available cleaning agent suitable and authorised for use on milking plant. Alternate cleaning with an acidic and alkaline agent achieves optimum results.**

	CAUTION	**The LC should be dried under vacuum after cleaning.**

The LactoCorder® is also suitable for cleaning using boiling water but one must ensure that rinsing with cold water takes place before cleaning with boiling water commences (as in the case of normal cleaning).

Fig. 8-1,Dismantling



9	*Central screw*	**V**	*Preliminary sieve*

Large dirt particles, such as spreading straw, feed residue or flakes, should be removed before cleaning commences with the cleaning machine. This is carried out by opening the LactoCorder with the central screw which is located at the back (9). The preliminary sieve (V) located in the pre-chamber can then be removed and cleaned.

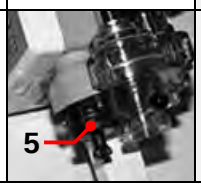
	WARNING	**Separate mechanical or chemical cleaning of measuring probes (e.g. scrubbing with scouring agents or similar substances) is forbidden.**

8.2.1 Cleaning Monitoring

The cleaning (stand-by operating mode) is activated automatically when the measuring menu is exited after measuring. If the cleaning is exceptionallynot started directly after the milk measurement then the cleaning (stand-by operating mode) may be interrupted and activated again by actuating the point “Cleaning<2>” in the main menu.

A detailed description for cleaning monitoring you will find in the separate istruction „Cleaning Monitoring“.

8.3 CLEANING THE EXTERIOR

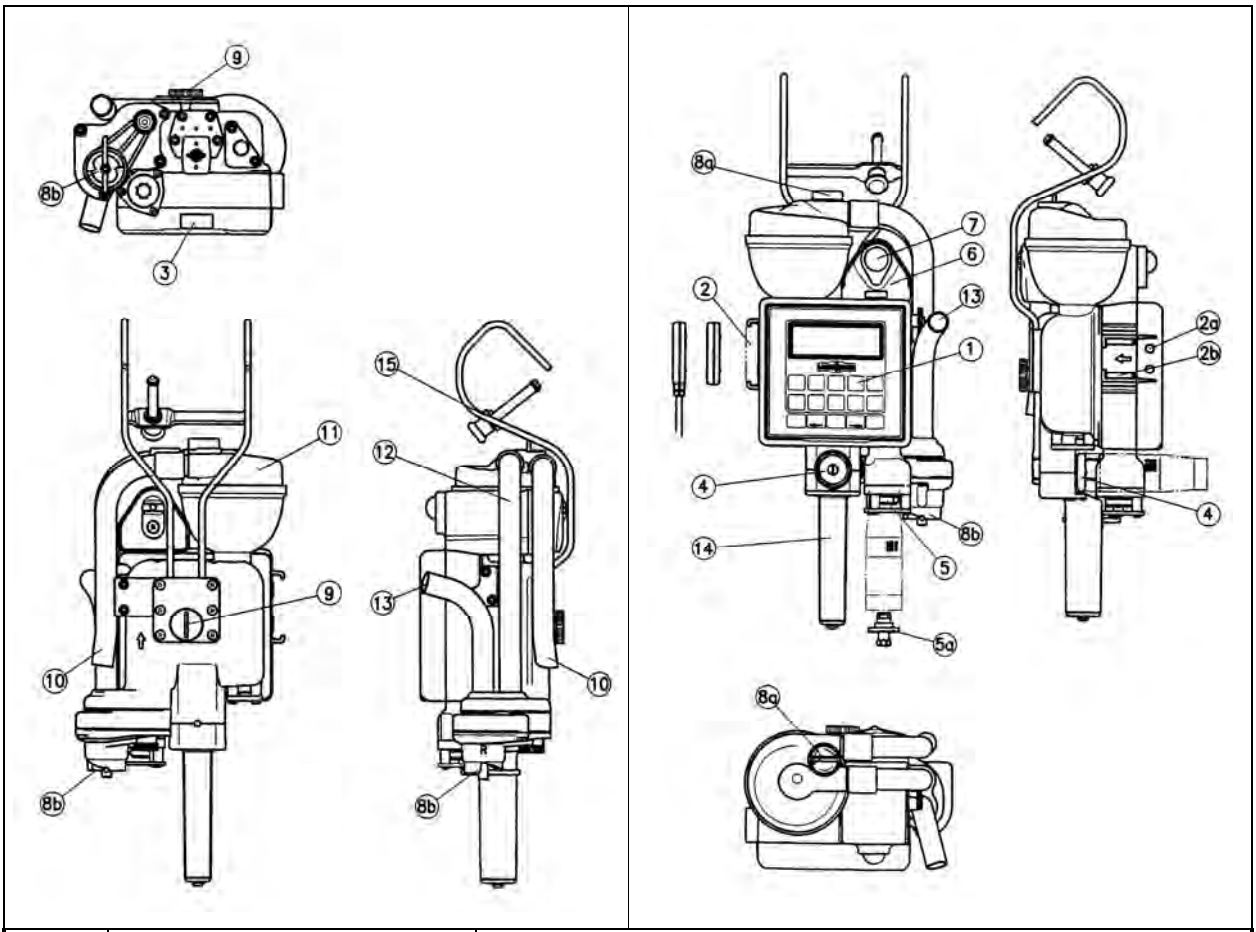
	CAUTION	**Never submerge the device in water or clean the electronics housing with water jet or high pressure!**
		**Wipe over the exterior of the sampling connection (5) including O-Ring thoroughly with a damp cloth after a milking session with sampling.**

The LactoCorder® conforms with the IP64 protective system which means that it is protected against both dust and water spray (6 bar at 30 cm distance (udder shower)).

Cleaning the exterior should be confined to wiping with a damp cloth. The electronic and hydraulic modules can be separated by means of the central screw / quick release fastener (9) for thorough exterior cleaning.

A APPENDIX

A.1 EXTERIOR FUNCTION ELEMENTS ON THE LACTOCORDER®



No.	Element	Description
1	Operating panel	Consists of: • a display, 4 lines, 20 columns • an alpha-numeric keyboard • function keys
2	Docking station	Attachment for • a DPK (data transfer) • a battery charger
2a	Optical coupler	Data transmission
2b	Sliding contact	DPK power supply Power input for charging the batteries

3	ID-Reader	Recording sample bottle-ID
4	Rotary table[1]	Securing the sample bottle during identification
5	Sampling socket	Mount for sample bottle
5a	Stopper	Stopper for sample opening when taking measurements/cleaning without sampling
6	Battery housing	Contains the LC batteries
7	Signal lamp	• Milk flow indicator • Warning lamp
8	Change-over lever	Setting for “Milking“ or “Cleaning“
9	Central screw / Quick release fastener	Opening the hydraulic component
10	Inlet	Connection for milk hose from the milking apparatus
11	Centrifugal head	Transport air separation
12	Bypass	Diversion of separated transport air
13	Outlet	Connection for milk hose to the milk line
14	Handle	
15	Shackle with safety pin	Hanging and securing the LC

[1] At ID-registration with transponder the rotary table is omitted.

A.2 ERROR MESSAGES

Message	Description
****** Message 4 ****** **BttrCharge aborted** **due to very low** **battery voltage**	Message 4: The battery voltage is too low, the charging current could be overburdened. Charging has thus been terminated. Remedy: Battery must be changed.
******* Message 6 ****** **The value looked for** **Has not been found** **Continue..... <E>**	Message 6: The entered value has not been found.
******* Message 7 ****** **This value** **is not acceptable** **Continue..... <E>**	Message 7: Inadmissible inputting from keyboard
******* Message 8 ****** **LactoCorder is not** **sufficiently filled** **Continue..... <E>**	Message 8: Just at measuring point analysis: The gauge height is too deep for his analysis.
******* Message 9 ****** **RAM error. Data may** **have been lost** **Continue..... <E>**	Message 9: Error in the check sum of a RAM sector Remedy: Rectified by LactoCorder. Data saved in the LC may be lost as a result.
****** Message 12 ****** **The active function** **has been interrupted** **Continue..... <E>**	Message 12: A window was closed with <CLEAR> or <STOP> without completing the requested inputting.
****** Message 17 ****** **Function not** **implemented** **Continue..... <E>**	Message 17: The function called up is not available
****** Message 18 ****** **A value of 0** **Is not acceptable** **Continue..... <E>**	Message 18: The value “0” is not admissible for this entry from the keyboard. New entry
****** Message 20 ****** **Error while writing** **to EEPROM A** **Continue..... <E>**	Message 20: Error while writing to EEPROM A Remedy: send device to manufacturer for servicing
****** Message 21 ****** **Error while writing** **to EEPROM C** **Continue..... <E>**	Message 21: Error while writing to EEPROM C Remedy: send device to manufacturer for servicing

Message	Description
****** Message 22 ****** **Unsuitable parameter for EEPROM A** **Continue..... <E>**	Message 22: While entry of new EEPROM-parameters from DPK invalid values for EEPROM A have been ascertained.
****** Message 23 ****** **Unsuitable parameter for EEPROM C** **Continue..... <E>**	Message 23: While entry of new EEPROM-parameters from DPK invalid values for EEPROM C have been ascertained.
****** Message 25 ****** **Date/Time LC-clock** **Continue..... <E>**	Message 25: Appears before the main menu when date/time of the interior clock of the LC is not plausible. Remedy: Set the clock by means of reading in of herddata or in the service-menu
****** Message 30 ****** **Milking data in RAM** **Save to DPK first** **Continue..... <E>**	Message 30: In the sector of data RAM which need to be cancelled, there are still data which have not been read out yet.
****** Message 31 ****** **Data RAM is full** **Continue..... <E>**	Message 31: The data RAM is full. Remedy: Save the measured values to a DATAPACK
****** Message 32 ****** **Please save data RAM to DP first!** **Continue..... <E>**	Message 32: The data RAM is temporarily required for a purpose other than filing data. However, it still contains measured values. Remedy: Save the measured values to a DATAPACK first.
****** Message 33 ****** **Error in format of data RAM** **Continue..... <E>**	Message 33: The data in the memory of measured values are not intact. Remedy: Erase measrued values
****** Message 34 ****** **No milking data found** **Continue..... <E>**	Message 34: Info: No animal from this herd found
****** Message 35 ****** **No herd data for this herd number** **Continue..... <E>**	Message 35: Info: No data from this herd found
****** Message 36 ****** **To many animals in DATAPACK** **Continue..... <E>**	Message 36: Info: Too many animals for the display/printing
****** Message 38 ****** **More than 4 times same anim.number 2** **Continue..... <E>**	Message 38: Info: The same animal number occurs more than 4 times. A maximum of four milking sessions can be processed with the same cow number

Message	Description
****** Message 40 ****** **No communication with DATAPACK** **Continue..... <E>**	Message 40: No communication with DATAPACK. Remedy: Insert again/ change DATAPACK; verify the cleanness of liaison and windows
****** Message 41 ****** **DATAPACK can not be Read** **Continue..... <E>**	Message 41: Error during reading from DATAPACK Remedy: Change DATAPACK. Inform manufacturer if the same error occurs with several DATAPACKS.
****** Message 42 ****** **DATAPACK can not be Written to** **Continue..... <E>**	Message 42: Error during writing on DATAPACK Remedy: Change DATAPACK. Inform manufacturer if the same error occurs with several DATAPACKS.
****** Message 43 ****** **DATAPACK without Clock** **Continue..... <E>**	Message 43: During inputting of herd data, if the LC clock is compared with the DATAPACK clock: The inserted DATAPACK has no clock
****** Message 44 ****** **Clock of DATAPACK can not be read** **Continue..... <E>**	Message 44: During inputting of herd data, if the LC clock is compared with the DATAPACK clock. The DATAPACK clock cannot be read.
****** Message 46 ****** **DATAPACK can not be Erased** **Continue..... <E>**	Message 46: During herd data editing or saving data to a Datapack; The DATAPACK cannot be erased (and cannot as a result be written on again) Remedy: Change DATAPACK
****** Message 47 ****** **DATAPACK full** **Continue..... <E>**	Message 47: The memory manager in the DATAPACK has no more room. No more data can be saved to this DATAPACK, until the DATAPACK is read. Remedy: Change DATAPACK
****** Message 48 ****** **Checksum error in I/O with DATAPACK** **Continue..... <E>**	Message 48: The communication with the DPK is secured with the check sum. A check sum of this sort is received incorrectly. Remedy: Try again. If the same error reoccurs several times, send device or DPK to manufacturer for servicing.
****** Message 51 ****** **DATAPACK has incorrect data** **Continue..... <E>**	Message 51: The DATAPACK does not contain the data requested for the started operation. Remedy: Insert correct DATAPACK
****** Message 52 ****** **DATAPACK has not enough free space** **Continue..... <E>**	Message 52: The DATAPACK has no longer enough free room for the started operation. Remedy: Change DATAPACK
****** Message 53 ****** **Error in system area of Datapack** **Continue..... <E>**	Message 53: The memory manager in the DATAPACK is defective. Reading and writing is no longer possible. Remedy: Erase DATAPACK

Message	Description
****** Message 55 ****** **DATAPACK: Free space not totally erased** **Continue..... <E>**	Message 55: The DATAPACK was not erased correctly. Remedy: Change DATAPACK or erase again
****** Message 56 ****** **Error in checksum of herd data** **Continue..... <E>**	Message 56: The data input in the LactoCorder® are secured with a check sum. This check sum reports errors. Remedy: Input herd again from DATAPACK.
****** Message 57 ****** **Edit not allowed herd too large** **Continue..... <E>**	Message 57: Editing of herd data in the LC is only possible to a certain extent in the herd data (always possible for 128k herd data DPKs). If the herd data is too extensive this message appears, as to whether herd data should be edited.
****** Message 59 ****** **Change DATAPACK not enough free room** **Continue..... <E>**	Message 59: The DATAPACK has no longer enough free room for the started operation. Remedy: Change DATAPACK
****** Message 60 ****** **Datapack has no herd data** **Continue..... <E>**	Message 60: No herd data was found in the DATAPACK while inputting from DATAPACK Remedy: Insert DATAPACK with herd data
****** Message 62 ****** **DATAPK has been read Info not possible** **Continue..... <E>**	Message 62: INFO: A DATAPACK which has already been read can not be viewed again with Info.
Can be saved only to DATAPACK which was read. Change DPK then..... <E>	Message 63: Editing herd data: This message appears if an attempt is made to save edited herd data to datapack other than that from which it was read. Remedy: Do not change DATAPACK while editing herd data.
****** Message 65 ****** **Online data in DPK are incomplete** **Continue..... <E>**	Message 65: Online measuring with output to DATAPACK: The online data is probably incomplete Remedy: None
Herd data loaded **Insert Datapack for access to function** **Continue..... <E>**	Message 66: Online measuring with output to DATAPACK: The online data is probably incomplete Remedy: None
****** Message 67 ****** **Transfer to DPK not completed. Data may not be usable... <E>**	Message 67: Transfer of data to DPK is incomplete. Data on DATAPACK is lost. Remedy: save again to another DATAPACK
****** Message 70 ****** **Read error while reading sample ID** **Continue..... <E>**	Messsage 70: Read sample ID: reading error Remedy: Repeat reading, change bottle / transponder

Message	Description
****** Message 71 ****** **Timeout while** **Reading sample ID** **Continue..... <E>**	Message 71: Read sample ID: Timeout of reading process Remedy: Repeat reading, change bottle / Transponder
****** Message 72 ****** **Error in checksum** **of barcode** **Continue..... <E>**	Message 72: Read barcode: The check sum of the barcode read registered “Incorrect”. Remedy: Repeat reading, change bottle
1st digit of barcode **not acceptable** **Change bottle** **Continue..... <E>**	Message 73: Read barcode: The first digit of the barcode can be limited to a pre-set number in the herd data. This message appears if a number other than the pre-selected number is read as the first digit in the barcode. Remedy: Change bottle.
****** Message 75 ****** **Sampling error** **Bottle overflows** **Continue..... <E>**	Message 75: The sample bottle is too full due to a large deviation between the expected and the actual milk yield and the separation was switched off. Remedy: Correct expected yield
****** Message 81 ****** **Error: Multiple** **animal number** **Continue..... <E>**	Message 81: Multiple animal number Remedy: Adjust herddata
****** Message 82 ****** **Animal not accepted** **Too many animals** **Continue..... <E>**	Message 82: The newly-input animal could not be registered. The maximum permissible number of animals is already registered. Remedy: None
****** Message 83 ****** **Error in herd data** **Reload herd data!** **Continue..... <E>**	Message 83: Error in herd data Remedy: Load herd data again from DATAPACK
****** Message 84 ****** **Incompatible format** **code of herd data** **Continue..... <E>**	Message 84: Incorrect herd data format code. Incorrect herd data format. Remedy: create a new herd data DPK with correct format. Then load herd data again.
****** Message 85 ****** **Herd data not loaded** **more than xxx animal** **Continue..... <E>**	Message 85: Input data transfer: The herd data of the herd to be loaded contains more than the permissible number of cows. The herd cannot be loaded in the LactoCorder. Remedy: Divide herd if possible
****** Message 87 ****** **Sensors are not dry** **Switch off LC... <E>**	Message 87: Auto-Calibration can not be carried out. Sensorrs are not dry. By pushing key <5> the main menu is accessible.
****** Message 90 ****** **No data logging** **due to system error** **Continue..... <E>**	Message 90: MP offset cannot be corrected Remedy: send device to manufacturer for servicing

Message	Description
****** Message 91 ****** **No data logging** **due to system error** **Continue..... <E>**	Message 91: A division by 0 has arisen during internal table calculations. Remedy: load program and parameters again
****** Message 92 ****** **No data logging** **due to system error** **Continue..... <E>**	Message 92: Incorrect check sum for parameter A Remedy: load program and parameters again
****** Message 93 ****** **No data logging** **due to system error** **Continue..... <E>**	Message 93: Incorrect check sum for parameter C Remedy: load program and parameters again
****** Message 94 ****** **No data logging** **due to system error** **Continue..... <E>**	Message 94: Table mpkf contains an invalid value Remedy: load mpkf parameters again, only possible with a system specialist
****** Message 95 ****** **No data logging** **due to system error** **Continue..... <E>**	Message 95: Test at start are suppressed (key<C>) Measuring is therefore not permitted Remedy: switch off LC and switch on again. Start tests are carried out.
****** Message 97 ****** **No data logging** **due to system error** **Continue..... <E>**	Message 97: Error during internal table mplin0 calculation. Remedy: load program and parameters again
****** Message 98 ****** **Restart due to error** **Insert empty DPK** **Continue..... <E>**	Message 98: Restarting of LactoCorder due to internal error. Remedy: send device to manufacturer for servicing
****** Message 99 ****** **No data logging** **due to system error** **Continue..... <E>**	Message 99: Incorrect check sum for program Remedy: load program and parameters again
Inclination exceeds **permissible limits** **Put in vertical pos!** **Contiue..... <E>**	Message 120: LactoCorder® does not hang vertically Remedy: position vertically
****** Message 121 ***** **Inclinometer not** **calibrated** **Continue..... <E>**	Message 121: Inclinometer is not calibrated Remedy: send device to manufacturer for servicing
****** Message 122 ***** **Invalid values from** **inclinometer** **Continue .....<E>**	Message 122: LactoCorder® tilt sensor measures invalid value. Remedy: send device to manufacturer for servicin

Message	Description
****** Message 124 ***** **Pre-log time >30 min** **Logging aborted** **Continue ....<E>**	Message 124: Measuring is terminated after 30 min. lead time. A flow of 200 g/min was not achieved during the 30 minutes. Remedy: repeat measuring
****** Message 125 ***** **Logging time >25 min** **Logging aborted** **Continue ....<E>**	Message 125: Measuring: measuring was interrupted after approx. 25 minutes. Remedy: repeat measuring
****** Message 126 ***** **Rinse lever?** **Main gasket?** **Continue..... <E>**	Message 126: During measuring: Rinse lever is probably wrongly adjusted Remedy: adjust rinse lever correctly
****** Message 127 ***** **Standing milk de-** **tected. Vacuum ok?** **Continue..... <E>**	Message 127: During measuring: vacuum is probably poor Remedy: ensure effective vacuum
****** Message 128 ***** **Abort at flow >** **Is LC empty?** **Continue..... <E>**	Message 128: Termination of measuring: measuring was ended due to the milk flow being too high
****** Message 150 ***** **Service buffer is** **Empty** **Continue..... <E>**	Message 150: There are no data in the service buffer which may be read out.
****** Message 160 ***** **Format version of** **header not correct** **Continue..... <E>**	Message 160: The data being read has an inadmissible format code. This can occur if the rejected data is measured with an older version of the LactoCorder® system program.
****** Message 210 ***** **Weight unit lb not** **Allowed with goats** **Continue..... <E>**	Message 210: Goats can just be measured with weight unit in kg.
****** Message 211 ***** **Unknown species** **Weiter ..... <E>**	Message 211: If with herddata: verify herddata If without herddata: set kind of species in the service menu
****** Message 220 ***** **No connection with** **Telepack** **Continue..... <E>**	Message 220: Verivy connection with Telepack
****** Message 222 ***** **No or invalid** **animal data** **Continue ....<E>**	Message 222: No valid animal data received from Telepack

Message	Description
****** Message 223 ***** **Checksum error in animal data** **Continue..... <E>**	Message 223: Verify connection to Telepack
****** Message 224 ***** **Incorrect LC number in animal data** **Continue..... <E>**	Message 224: Adjust miliking parlor newly.
****** Message 226****** **No or invalid sample bottle ID** **Continue..... <E>**	Message 226: No valid sample-ID received from Telepack
****** Message 227 ***** **Checksum error in sample bottle ID** **Continue..... <E>**	Message 227: Verify connection to Telepack
****** Message 228 ***** **Incorrect LC number in sample bottle ID** **Continue..... <E>**	Message 228: Adjust miliking parlor newly
****** Message 230 ***** **Configuration data not valid** **Continue..... <E>**	Message 230: Verify configuration data and connection to Telepack
****** Message 231 ***** **Checksum error in configuration data** **Continue..... <E>**	Message 231: Verify configuration data and connection to Telepack
****** Message 232 ***** **Incorrect LC number in config.data** **Continue..... <E>**	Message 232: Adjust miliking parlor newly
****** Message 234 ***** **Timeout reading from Telepack** **Continue..... <E>**	Message 234: Verify connection to Telepack
****** Message 238 ***** **Type of sample ID Not valid** **Continue..... <E>**	Message 238: Verify configuration data
****** Message 240 ***** **No values have been witten to TPK** **Continue..... <E>**	Message 240: The writing of measuring data to Telepack has been aborted with the key <C>.

Message	Description
****** Message 242 ***** **Checksum error in TPK_found** **Continue..... <E>**	Message 242: The answer from test of the connection with Telepack has been obtained with wrong checksum.
****** Message 250 ***** **LactoCorder without Barcode reader** **Continue..... <E>**	Message 250: Sample-ID form Barcode-Reader is requested, but the LC does not have a Barcode-Reader.
****** Message 251 ***** **LactoCorder without transponder reader** **Continue..... <E>**	Message 251: Sample-ID from Transponder-Reader requested, but the LC does not have a Transponder-Reader.
****** Message 252 ***** **Sample-ID from Com-Mander not allowed** **Continue..... <E>**	Message 252: There is a value in the herddata which is valid for Commander-Measuring only. Remedy: Verify herddata
****** Message 340****** **Error while reading ID-Pack** **Continue..... <E>**	Message 340: The animal-ID could not be read from ID-Pack.
****** Message 341 ***** **ID-Pack does not Respond** **Continue..... <E>**	Message 341: No connection with ID-Pack
Unknown error ********************* **Error-Number xxx** **Continue..... <E>**	Message: An error has occurred which is not assigned to any error indicator Remedy: inform manufacturer

A.3 THE MEASUREMENT DATA AND OPERATING DATA CAPACITY OF A DATAPACK

Measurement data

The measurement data from a measuring consists of a fixed ingredient and a variable component, depending on the period of measuring. The following data yields are produced during measuring:

- 8 minutes measuring period: 800 Bytes
- 10 minutes measuring period: 928 Bytes

Datapack 128 kB

The 128kB DPK has a usable memory capacity of 95kB, the rest being needed for the internal program and management. The outcome of this is the following memory capacity in terms of "Number of measurements“:

- Average measuring period of 8 minutes: 121 measurements
- Average measuring period of 10 minutes: 104 measurements

Datapack 512 kB

The 512kB DPK has a usable memory capacity of 447kB, the rest being needed for the internal program and management. The outcome of this is the following memory capacity in terms of "Number of measurements“:

- Average measuring period of 8 minutes: 574 measurements
- Average measuring period of 10 minutes: 494 measurements

Datapack 2 MB

The 2MB DPK has a usable memory capacity of 2MB for measuring data. For operating data there is 1MB available as the rest is needed for the saving of the edited herds. The outcome of this is the following memory capacity in terms of "Number of measurements“:

- Average measuring period of 8 minutes: 2019 measurements
- Average measuring period of 10 minutes: 2308 measurements

Operating data

OD consists of a fixed ingredient per herd (199 Byte) and a variable component which depends on the number of registered animals (30 till 60 Byte per animal, depending on the OD-format).

The rule of thumb is: With OD-format 2 a maximum of about 3285 animals can be saved.

This capacity reduces by about 8 animals, depending on the herd.

Example: 30 herds are registered → capacity in this case is 3045 animals.

Cleaning data

If cleaning takes place associated with the registration of characteristic values then these are stored using 86 Bytes per cleaning. In addition to these 86 Bytes max. 1020 Bytes are added in cases where selection of the extended characteristic values has been made (depending on the cleaning time).

A.4 ROUTINE ANNUAL INSPECTION OF MILK YIELD MEASURING DEVICES (ACCORDING TO ICAR)

A.4.1 GENERAL INFORMATION

	CAUTION	**The routine inspection with water must be carried out on perfectly clean devices.**

	CAUTION	**In order to avoid remains of dried test fluid, the devices must be cleaned after the test by means of a normal alkaline CIP-cleaning (Cleaning in Place) and a proper afterrinsing with clean water.**

A.4.2 REFERENCE VALUE

The LactoCorder milk yield measuring device's reference value is established by dividing the value read from the display by a correction factor. This correction factor takes account of the difference between the specific weight, the viscosity of the milk as well as its foaming characteristics and the test fluid. In all firmware versions until 063xxxx measured with Florin S Plus this correction factor is 1.000 which means that no correction is necessary. From version 06403xx, which has integrated the measurement of goats, the correction factor is 1.014. However, by measuring with **Neoagrar Top S** the correction factor is for **all firmware** versions **1.000**. The results of earlier inspections are available for use during periodic inspections.

A.4.3 REQUIRED EQUIPMENT

- Vacuum pump with negative pressure of 40 to 50 kPa
- Hoses with a 14-16mm internal diameter
- Flow reducer (Flow ca 5.5 kg/min), art.2506 (supplier: WMB AG)
- Intermediate piece with air inlet, art.2505 (supplier: WMB AG)
- Calibrated electronic scales
- A bucket with a volume of at least 15 litres
- A milking pail for receiving the test fluid
- Thermometer

A.4.4 TEST FLUID (NEW: TWO ALTERNATIVES)

A.4.4.1 Florin S Plus

- Water with a temperature of 20 °C +/- 5 °C
- Addition of

  - 2% (volume-%) Florin S Plus, art.2685 (10 litres) art.5073 (1 litre) (supplier: WMB AG)

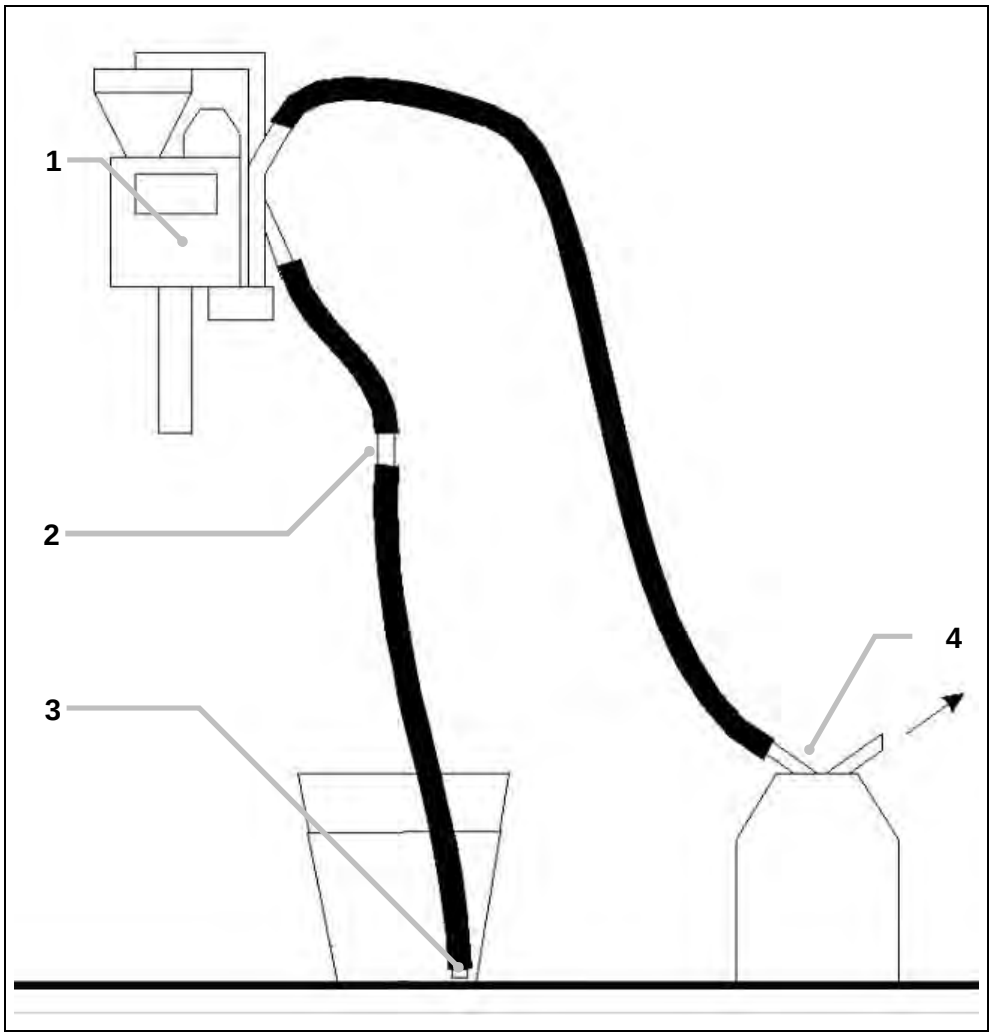
  - 0.1% (volume-%) ANTIFOAM Y30 EMULSION, art.1290 (supplier: WMB AG)
- Mix test fluid well. The test fluid may be used for 50 measurements and one day only.

A.4.4.2 Neoagrar Top S

- Water with a temperature of 20 °C +/- 5 °C
- Addition of

  - 0.3% (volume-%) Neoagrar Top S, art.15566 (supplier: WMB AG)
- Mix test fluid well. The test fluid may be used for 50 measurements and one day only.

Fig. A.4.4, Configuration for routine inspection



1 *Secure LactoCorder at a height of approx. 1.5 metres (untilted)*

2 *Art.2505 Intermediate piece with air inlet*

3 *Art.2506 Flow reducer*

4 *Connection vacuum 40 to 50 kPa*

A.4.5 TEST PROCEDURE

1. Have the bucket with approximately 15 litres of test fluid ready and calculate its exact weight
2. Switch on the LactoCorder using the ON OFF key
3. From version 06403 for species select “cows”
   - In the main menu <5> continue
   - Service <6>
   - Adjustments I <2>
   - Continue <E>
   - Species <6> (select cows <1>)
4. Shift further in the main menu with key <5>
5. Select the menu “ Measuring without OD" using key <7>

6. Confirm correct position (i.e. “milking”) of the rinse levers using the key requested by the device <x> (random number)
7. Enter herd number (any number, e.g. <1>)
8. Enter milking position (any number)
9. Select menu “with signal lamp” using key <1>
10. Measuring with or without sampling (variant 10.1 or 10.2)

10.1 Select menu “without sampling” using key <1>

10.1.1 Insert stopper

10.1.2 Enter animal number (any number, e.g. <1>) and start measuring using key START STOP

10.2 Select menu “with sampling” using key <3>

10.2.1 Insert sample bottle

10.2.2 Select menu “No sample ID” using key <1>

10.2.3 Enter animal number (any number, e.g. <1>) and press key START STOP

10.2.4 Enter expected milk yield “20 kg” and start measuring using key START STOP

11. Suck approx. 10 kg. of test fluid out of the bucket
12. Terminate measuring by removing sucking hose from test fluid. Ensure that water flowing back through the hose is caught in the bucket
13. When the signal lamp lights up terminate measuring by pressing START STOP
14. Divide value displayed on the device by the above-mentioned correction factor (1.000 respectively 1.014) to establish the reference value.
15. Measure the weight of the bucket with the remaining water and subtract from the initial weight.
16. Determine the difference between the reference value and the effective quantity of water drawn through.
17. Cleaning the devices with an alkaline detergent and rinsing it afterwards with clean water.

A.4.6 ANALYSIS OF SAMPLE VOLUME

- The reference value for the sample volume must be between 33 and 38 g.
- If the result of measurement lies within the range of the reference value, the device is cleaned with clear water while also rinsing through the split-off valve by means of the valve test (see separate instruction “Cleaning Monitoring”).
- If the result of measurement lies outside the range of the reference value the following fault could be present:
  - The sampling valve has not been cleaned properly.
  - The concertina seal for ventilating air during sampling is missing.
  - The concertina seal is damaged.

- The sampling bottle is damaged in the area of the mounting throat and is not sealing or is otherwise leaky.
- The O-ring on the bottle holder is damaged.
- There is an air gap between the bottle holder and the sampling mount.
- A crack in the housing of the sampling mount.

If all such error sources have been excluded the "Correction sample amount" must be checked and adjusted as necessary (factory-adjusted).

1. Shift to another menu point in the main menu by pressing the <5> key
2. Select key <6> in the 'Service' menu
3. Select key <2> in the 'Settings' menu
4. Select the menu 'Correct sample size' with the <3> key, enter the difference and confirm by pressing the <Enter> key.
5. Select the menu 'Back' using the <Clear> key 3 times until one arrives back in the main menu and continue the test procedure.

Please send the device to the Service Centre to be checked if the result of measurement still cannot be brought to match the reference value even after entering a correction value.

A.4.7 ANALYSIS OF MEASUREMENT RESULTS (ACCORDING TO DR. D. NOSAL

- The device is functioning correctly if the difference between the first measuring results is a value less than 0.1 kg.
- A second measuring should be carried out if the difference for the first measuring is greater than 0.1 kg.
- The device is functioning correctly if the average difference between both measuring results is a value less than 0.2 kg.
- A third and fourth measuring must be carried out if the difference is greater than 0.2 kg.
- Measuring should be repeated if the limit value cannot be maintained. First check the device for damage or incorrect assembly.
- If the limit value still cannot be maintained the device should be subjected to alternating acidic / alkaline cleaning. (The test fluid has different moistening characteristics to milk which means that contamination of the device during the water test will become more marked than for milk measuring).
- The MPKF factors should be reloaded if necessary, as they can be slightly altered by water measuring with dirty devices. (Measuring in milk would, however, lead to rapid automatic normalisation of these factors).
- If the limit values still cannot be maintained the device should be sent to the service centre or manufacturer for inspection.

A.5 LACTOCORDER-PC-SOFTWARE “LACTOPRO”

Information about PC-Software “LactoPro” you will find on our website http://www.lactocorder.ch.