

Measuring and data technology for milk tankers

Tamper-proof – officially approved – accurate



Quality ensures success – GEA Diessel's measuring and data technology

Milk on its way from the cow to the consumer is subject to ever more stringent requirements with regard to quality. Reliable standards of hygiene and the composition of the raw milk are getting to be economic factors of substantial importance – to farmers, to tanker fleet operators, and to the dairy industry itself.

If these three partners are to work together smoothly, there must be a transparent and reliably accurate method of accounting common to them all. It is therefore absolutely essential that all aspects of transportation from farm to dairy should be reliably documented.

GEA Diessel offers tried and tested measuring and data technology for the capture of all the relevant data, and for archiving it or transmitting it elsewhere. Our customer-orientated solutions provide a sure foundation for complete end-to-end documentation.

Like the milk itself, the process of recording quantities and other data is subject to stringent quality requirements. GEA Diessel's metering devices comply with the standards laid down by law. They are officially approved and provide a sound basis for milk payments to be remitted correctly.

All devices and components can be added to as required, and make use of up-to-date technologies, such as GPS for supplier identification and GPRS for data communication.

In addition to this focus on accuracy of measurement, the aspects of energy efficiency and time optimisation are also vital factors in our product development.

The best way is our way –
the way of GEA Diessel quality!



This is what you can expect from us:

- compact equipment, pre-assembled and pre-tested
- highly accurate measurement and high repeatability
- weights and measures approval (Measuring Instruments Directive M. I. D.) for the complete metering equipment (OIML certificate for individual devices)
- simplicity of operation
- high flow rate
- high flexibility to meet customers' individual requirements
- competent technical support right from the beginning of the project

Precisely the thing – mobile metering with weights and measures approval

The demand for high-quality raw milk is increasing – and this growing demand leads to an even increasing value of this product. As a result, farmers are anxious not to lose a drop, while the dairies and the whole dairy industry are very sensitive to transportation costs. Everybody keeps a very close eye on everything. GEA Diessel's metering devices, systems and equipment give all those concerned a sound basis for obtaining accurate measurement values.

Our flagship device of former days, the mechanical "Diessel meter", was succeeded long ago by a new generation of flow meters with non-contact sensors; and these electromagnetic flow meters of the IZM™ series have many attractive properties. In particular, they are maintenance-free and wear-free, and represent an inexpensive investment. Their accuracy of measurement, linearity and repeatability comply with the requirements of the weights and measures authorities. With this series, we are able to cover all applications where flows or volumes need to be measured, down to the minimum reception quantity of 10 litres.

The IZMAG™, for example, is able to transmit volume pulses to a remote display unit or an external data capture system in a manner approved by the weights and measures authorities. In addition, an active status signal provides continuous documentation of the error-free operation of the metering

device. If required, it also automatically generates test certificates as proof of consistent quality – using wireless technology if necessary.

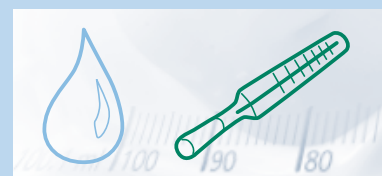


The IZMAG™ ensures accurate measuring values

Every measurement and every metering device can of course only be as good as the environment in which it is operated. As a concrete example: Any air entrained with the product will falsify the results. Any officially approved measuring point must therefore be equipped with an air eliminator. GEA Diessel has thus developed a combination of models including air eliminators, pumps and pump controls. They allow the progress of the milk to be precisely controlled by integrated sensors linked to a ZEVODAT device. These sensors react to any fall in pressure, and identify any air bubbles which are then reported to the control unit in the form of alarm signals. The control unit in its turn then

adjusts either the pumping mode or the flow rate, depending on the device.

An intelligent program allows the highest possible degree of measuring accuracy to be achieved, and so optimises tanker stopping times.



This is what we can do for you

GEA Diessel offers multifunctional solutions for exact measurement of volume and temperature during reception and delivery of liquid products. A variety of reception concepts permit liquids to be measured for weights and measures purposes with an accuracy of typically up to 0.15 per cent – even at high reception speeds of between 60,000 and $\geq 90,000$ l/h. The GEA Diessel range includes the following metering device concepts:

- a simple self-priming pump
- a partial vacuum in the transport tank
- a combination of a self-priming pump and a high-speed centrifugal pump
- high-speed intake with a combination of vacuum and centrifugal pumps

Intelligent in-truck computers – ZEVODAT-C1™ and ZEVODAT-flash™

The ability to record both the quantity and the quality of the milk and to identify the source of each delivery opens up a whole new range of possibilities in the processing chain. The continuous monitoring of both the each individual reception process and of the entire tanker load serves to support quality and tour management. This potential for optimisation can be further enhanced by bi-directional data transmission between the tanker and the central computer via the internet. These functions, which are available as extras, allow flexible route planning and optimised fleet management.

As a starter version of this data capture equipment, we recommend ZEVODAT-C1™. This device acts as an extension to the electromagnetic flow meter. It registers and stores all information that is relevant for the later accounting procedure and transmits it on to wherever the data is processed. At the same time, the ZEVODAT-C1™ can control individual plant components.



ZEVODAT-C1™

The ZEVODAT-flash™ is a modern, state-of-the-art device, allowing for a high degree of performance and com-

munication functionality. It is equipped with GPS as standard, so that suppliers are automatically identified. This logistical support is further optimised by the inclusion of an additional socket modem for GPRS transfer. This turns ZEVODAT-flash™ into a data transfer device that transmits the collected data and details of the individual reception procedures in real time. GPRS data transfer is a very economic transmission option in day-to-day operation, since the provider charges only for the volumes of data actually transmitted.



ZEVODAT-flash™

With this feature our customers are in a position, among other things, to optimise their tours in such a way as to save themselves not only time and travelling distance, but fuel as well. The GPRS system has also proved itself in the monitoring and logging of the individual reception procedures and of sampling. Any unexpected changes in the procedures are immediately identified at the control centre and reported back to the driver. Such early identification and immediate remedying of operator errors is indisputably an advantage to all those involved in the procedure.

Both devices possess OIML certification in conformity with Directive 2004/22 EC, and so can be used in measuring equipment subject to official approval pursuant to M. I. D.

Highlights of the ZEVODAT-flash™

- automatic supplier identification via GPS
- identification of the sample bottle by barcode or RFID tag is possible
- remote parameterisation is possible
- intelligent control of metering system and pumps is possible
- data memory up to 512 MByte is possible



We optimise your logistics

- Constant monitoring of quality-relevant data ensures traceability all the way along the transport chain.
- GPS satellite navigation simplifies the identification of suppliers.
- The mobile information system using GSM/GPRS represents an enormous and innovative step forward for the driver (e.g. in respect of route information) and the customer (e.g. in respect of the transmission of laboratory data).
- Thanks to secure data transmission from the tanker to the central data processing unit, errors in accounting are prevented.

Tried and tested – stand-alone samplers



Quantity is not the only criterion: The price paid for the milk also depends on its quality. Representative product testing with reliable identification of the supplier is essential. In addition, under EC Directive 178/2002 sampling must be performed at every stage in order to ensure traceability. GEA Diessel's reliable samplers contribute to fulfilling these various requirements.



Clean individual samples via over stand-alone sampler

The trick with representative sampling is that throughout the entire milk reception process, from the first to the last drop, a constant partial flow is diverted into the sample bottle.

In the stand-alone versions, these low-maintenance devices consist of the sampler and a control unit that con-

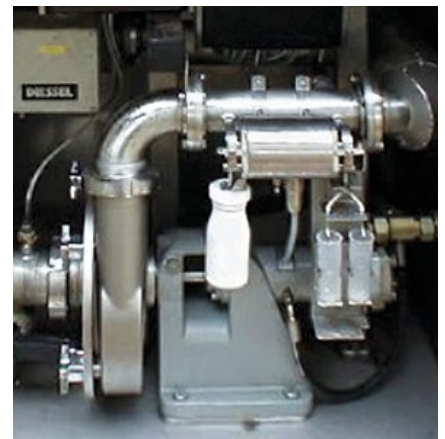
trols and regulates the taking of samples in accordance with time or volume criteria. They are easy to integrate into existing systems, and are also simple to extend. They are equipped with a sensor, so that they are able to interrupt time-interval sampling if, for example, there is an interruption in reception.

All stand-alone samplers are designed in such a way as to be able to take either individual or four samples



Fully automatic sampler

directly from the pipe. The sample of raw milk is then stored in a bottle bearing unique identification.



Sampler for multiple samples



Features that add value in day-to-day operations

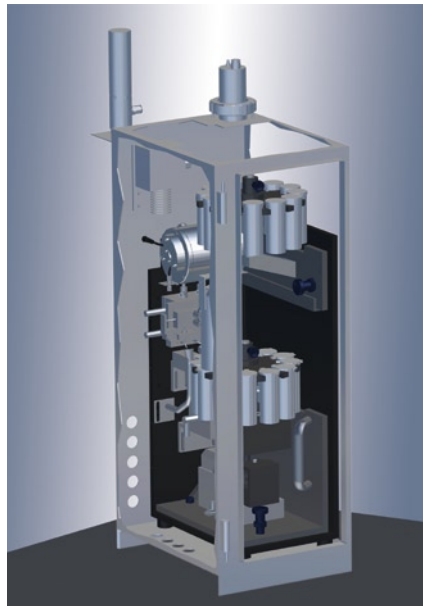
- It is possible to take two separate individual samples simultaneously.
- Sample bottles are filled continuously.
- Sample quantities can be regulated in 0.1 ml steps.
- low carry-over
- suitable for bacteriological sampling

Multitasking – fully automated sampling using the SampleGuard™

The GEA Diessel SampleGuard™ is the all-rounder among samplers. The use of this fully automated sampler leads to the strictest possible degree of surveillance. The SampleGuard™ unseals, opens and fills the sample bottle, and after sampling closes the bottle which was chosen at random during this process. Any tampering with the system is reported immediately to the surveillance centre – for the data control unit of the SampleGuard™ device – the ZEVO-DAT-flash™ – not only carries out surveillance functions but also effects data exchange with the control centre in real time contact by GPRS.

The SampleGuard™ is not only intelligent, it is also sensitive to an equal degree: Two sensors monitor the constant and continuous filling of the bottles, and interrupt immediately the sampling and milk reception in

the event of any fault. Sample bottles are identified electronically by RFID tags attached to them. Once filled, they are kept sealed and under surveillance in the refrigerated sample box – absolutely safe against tampering.

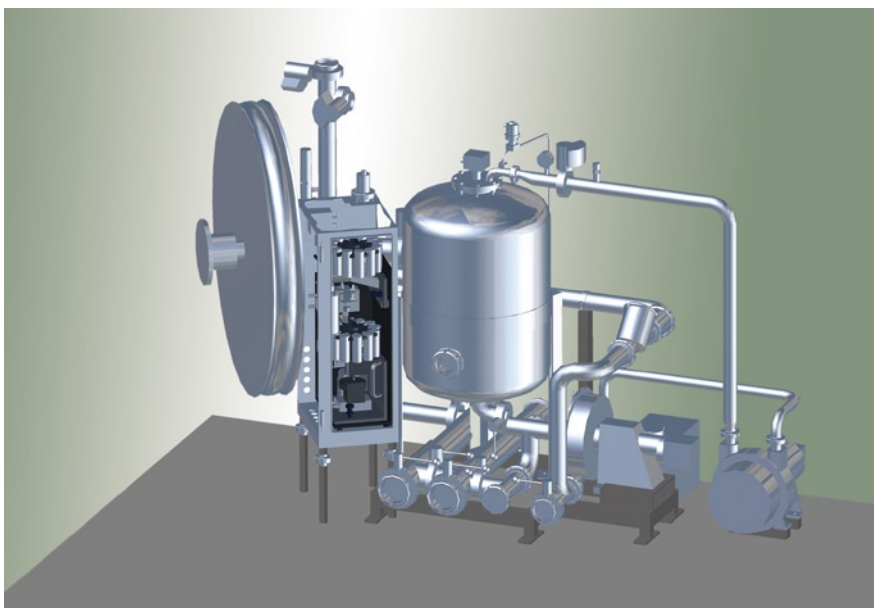


SampleGuard™









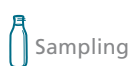
This you can rely on:

- The automated reception and discharge procedures exclude any possibility of tampering.
- GPS satellite navigation simplifies the identification of suppliers.
- Representative sampling with unique identification enhances the reliability of the laboratory analysis and the accounting.
- Thanks to secure data transmission from the tanker to the central data processing unit, errors in accounting are prevented.
- Thanks to the intelligent sensor technology, each sample bottle is filled to the same level.
- Temperature-regulated storage ensures that the sample retains its consistency unchanged until the end of the tour.



Customer-oriented solutions – sampling and upgrade varieties

Product equipment	Customer requirement	GEA Diessel solution	Option for optimisation
	automated extraction of a representative sample from the farm storage vessel	type PS3i™ peristaltic time-controlled stand-alone sampler with display and key pad	+ recognition of interruptions in flow through incorporation of a FlowSwitch sensor
	optimised filling, even during any interruptions in reception	installation of a sensor or connection of a switching contact in the pipe to the available input port of the electronic system	+ extended sampling to obtain an overall sample during the tour
	simultaneous taking of an individual sample and a tour sample	use of a second sampling head or of the dual sampler type PS4i™	+ automatic capture and transmission of supplier and tour data required for accounting purposes
	storage of all the necessary data and transmission to the data centre	installation extended by the addition of the ZEVODAT-C1™ or ZEVODAT-flash™ data capture system	+ automatic, accurate recording of the milk quantity by means of a volumetric measuring device
	automatic determination of quantity received from the supplier	installation of an officially approved volumetric measuring device (e.g. DIME-M™) with air eliminator and flow meter	+ enhancement of the reception capacity to 1,000 – 1,500 l/min.
	 officially confirmed measuring of milk quantities at high reception speeds	weights and measures approved high-speed measuring device with a variety of pumping combinations	+ tamper-proof milk collection through fully automated sampler
	sampling device with automatic presentation and sealing of the sample bottles	installation of the Sample-Guard™ sampling device	



Sampling

Data control

Volumetric measuring

Weights & measures approved

Tamper-proof

Automatic



GEA Diessel components for accurate mobile measurement and data technology

- Pump
- Air eliminator
- Flow meter
- Temperature sensor
- Gas bubble detector
- Sampler
- Non-return valve
- Control unit
- Data capture with voucher printer



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