

Ingeniously simple and reliable
level measurement technology



Solutions for the Animal Feed Industry



Reliable measurement technology for versatile solutions within the animal feed industry

UWT solutions for the measurement of level and point level of bulk solids and liquids are ready being used successfully in silos and process vessels within feed mills around the world. Innovative technologies, combined with comprehensive industry knowledge, allow us to provide the animal feed industry with a comprehensive range of customised measurement technology. The reliability of both our products and our services ensures that we are able to meet with total flexibility the variable and complex challenges of this industry.

The production of high quality animal feed and pet food is an important economic growth sector. As well as livestock feed, this sector also includes pet and sports animal nutrition. Consequently, there is enormous diversity of the end-products: feed for the agricultural sector, livestock such as cattle, horses and poultry; for dairy cattle and feed for breeding animals (eg in fisheries) as well as bird and rodent feed. So therefore, the pet food segment can be defined as being made up of nutrition for animals such as dogs, cats or reptiles.

The requirements of animals in terms of nutrition are diverse and so a variety of mixed feed formulations is needed to be manufactured.

Accordingly, the focus of the measuring technology equipment in the manufacturing plant is on the ability to easily and quickly adapt to the varying processing conditions.

The formulation of a compound feed is based on the particular use for which the product is intended. Similarly, the use of appropriate measuring sensors is in accordance with the relevant requirements of the application.





With the experience of more than one million successfully solved applications, UWT has for over 40 years delivered customised measurement solutions for customer-specific requirements.

High quality in the long term

Errors that occur in the processing plant during conveying, weighing and mixing, can rarely be offset or rectified at the next processing stage. Therefore, safe and high quality measurement technology is essential.

Quality assurance and quality management have for many years been well established values at UWT. Our level sensors are defined by their reliable functionality, easy handling and long service life. In accordance with the high demands and standards found in the food industry sector we as a medium sized, family run business, offer comprehensive support for your requirements and technical needs.



From conception through production to final assembly and comprehensive after-sales service, we provide all services for our equipment from a single source. Focus is placed on the highest quality, technical expertise and a good working relationship with customers, employees and partners.

**We offer the right measurement
technology for every process
within your plant**

Customer-oriented planning and experienced project management delivered by the experts at UWT allow the development of creative ideas and specified solutions that can be implemented efficiently. Manufacturing and testing of our products are in full accordance with strict technical guidelines of the CE conformity.

The level sensor is an indispensable element of the technical equipment within a modern feed production plant for the detection and monitoring of levels and limit levels within the different process stages. All UWT devices are designed to allow easy integration into the various processes and are characterised by being completely maintenance free in accordance with the principle of **"install and forget"**.



UWT with its high performance technology and advanced solutions is able to support and ensure the smooth operation of the feed production process:

■ **Highest quality means long service life**

UWT provides a guaranteed "Made in Germany" quality with a product performance rating of 99.8% within the warranty period. The high quality of our products is ensured by continual improvement processes.

■ **Individual product concepts - flexible, modular and economical**

UWT will configure the appropriate measurement technology for each of your applications. Even under constantly changing conditions, the sensors by their modular design offer flexible configuration (individual parts are available at all times). KIT solutions enable swift, individual equipment configuration and efficient stock-keeping. Sensor, process fitting, electronics and housing are matched to the specific requirements so that the installation is provided with an effective and reliable measurement technology.

■ **Planning security through precision**

Modern, high-quality technologies ensure continuous stress-free process flow. We develop sensors with maximum compatibility for your processes, so that they can be perfectly integrated into your systems and thus offer optimal support.



UWT Portfolio

UWT provides sensors for the measurement of level and limit level in bulk solids and liquids. Depending on the medium and application, different measurement techniques are used. In addition, we offer a range of complete systems for level monitoring and visualisation. The product lines include not only an economic standard but also particularly high grade, premium versions. UWT devices are completely **maintenance-free** and, importantly, carry **international certificates**. These certificates are supplied in view of the constantly expanding international markets. All limit switches are available with universal voltage electronics as standard or as an option.



Sensors for Level Detection:

Rotary Paddle Level Switch

- Variable extension lengths – either rope or tube
- Extension and process connection available in stainless steel
- Adjustable sensitivity
- EHEDG compliant
- Suitable for use in high temperatures of up to 1,100°C
- Modular design
- Rotonivo® 6000 SIL 2 compliant
- All-rounder suitable for all applications
- Wide variety of configuration options



Rotonivo® Serie 3/6

Rotary Paddle Level Switch

- Variable extension lengths – either with pendulum shaft or rope extension
- Version with plastic housing and process connection
- Various process connections
- Adjustable sensitivity
- Modular design
- Plastic design offers increased corrosion resistance



Rotonivo® Serie 4000

Vibrating Fork Level Switch

- Variable extension lengths – either rope or cable extension
- Extension and process connection available in stainless steel
- Sensitive to the lightest bulk materials (< 5g/l)
- EHEDG compliant
- Version with separate housing available
- NAMUR-electronics
- Suitable for interface measurement within sediment tanks/containers



Vibranivo® Serie 1/2/5/6

Vibrating Fork Level Switch

Vibranivo® Serie 4000

- Variable extension lengths – either rope or cable extension
- Extension and process connection available in stainless steel
- Extension, process connection and oscillators cast from one mould
- Sensitivity from 30g/l



Vibrating Single Rod Level Switch

Mononivo® Serie 4000

- Variable extension lengths – either rope or cable extension
- Heavy mechanical loading
- High quality material in the process (SS 316L)
- High surface quality
- Sensitivity adjustable in 4 settings
- Temperature range from -40°C to +150°C
- Robust version
- Suitable for overpressure up to 16bar
- Compact limit switch with threads from 1"



Capacitive Level Switch

RFnivo® Serie 3000

- Variable extension lengths – either rope or cable extension
- Extension and process connection available in stainless steel (Stainless steel probe material with FDA conformity)
- Version with plastic coated extension available
- Can be used in low dielectric values from 1.5 DK
- EHEDG compliant
- Suitable for use in high temperatures of up to 500°C
- Suitable for use in process pressures of up to 25bar
- "Active Shield Technology" for anti-caking functionality
- Available as remote version
- User friendly parameter setting via display and function buttons with measurement results given also via display
- Simple automatic calibration at start up



Capacitive Level Switch

Capanivo® Serie 4000

- Variable extension lengths – either rope or cable extension
- Version available with plastic housing, process connection and extension
- Extension FDA compliant
- Can be used in low dielectric values from 1.6 DK
- Suitable for use in high temperatures of up to 180°C
- "Active Shield Technology" for anti-caking functionality
- Integrated earthing in process connection
- No calibration required



Sensors for Level Control:

Electro-mechanical Plumb Bob Sensors

- Measuring range up to 50m (silo height)
- Easy commissioning
- Rope and tape version
- Integrated tape cleaner
- Threaded or flanged process connection
- Modbus and Profibus interface
- Reliable measurement results independent of material
- Suitable for interface measurement within sediment tanks/containers

NivoBob® Series 3000



Electro-mechanical Plumb Bob Sensors

- Measuring range up to 30m (silo height)
- Easy commissioning
- Rope and tape version
- Integrated tape cleaner
- Threaded or flanged process connection
- Aiming flange for angled installations

NivoBob® Series 4000



Radar sensor

- Measuring range up to 100m (silo height)
- Aiming flange model
- Robust stainless steel housing IP68
- High sensitivity ($DK \geq 1.6$)
- Temperature solution up to $+200^{\circ}\text{C}$
- 78 GHz technology
- 4° beam angle
- Lens antenna and mounting flange are flush
- Integrated lens cleaner
- Programming module
(Plug-on Display for programming and diagnostics / Quick Start Wizard)
- Simple, six-step commissioning

NivoRadar® 3000



Visualisation

- Web-based visualisation solution
- Level monitoring and analysis via ethernet
- Remote access via internet option
- Complete system for plug and play
- Sensor interface for 4-20mA or Modbus RTU
- Expandable to monitor up to 15 or 30 silos within a plant
- Full, empty, demand, fault alarm via email option
- Signal output for silo full alarm
- Effective silo management

NivoTec® Series 2/3/4



Complete system for:

- Level indication
- Trend display
- Data storage
- Remote fill level analysis

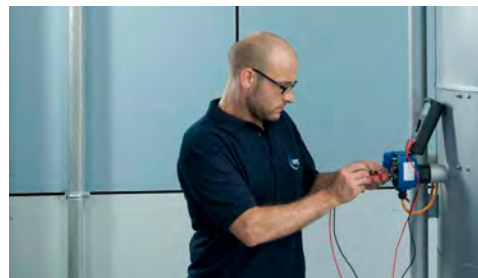
Project Planning

- Individual consultation for appropriate measurement technology
- Project support for technical queries
- Project planning for customer specific solutions



Service

- Sensor configuration by experienced application technicians
- Swift, professional installation and commissioning
- Full documentation of settings for future reference
- Full training for operating personnel



Customised measurement solutions for every process:

1 Conveying system

Back-fill detector for elevators, chain and screw conveyors and discharge tanks

Main features

CN

VN

MN

- Compact sensor
- No moving parts
- "Active Shield" to prevent caking
- No calibration needed

2 Pre-cleaning / Weighing

Level detection in purification and weighing process

Main features

RN

MN

- Suitable for all raw bulk materials
- Small threaded connection
- Robust measuring method
- ATEX certification

3 Raw Material Storage

Level measurement and overflow protection in raw material bunkers

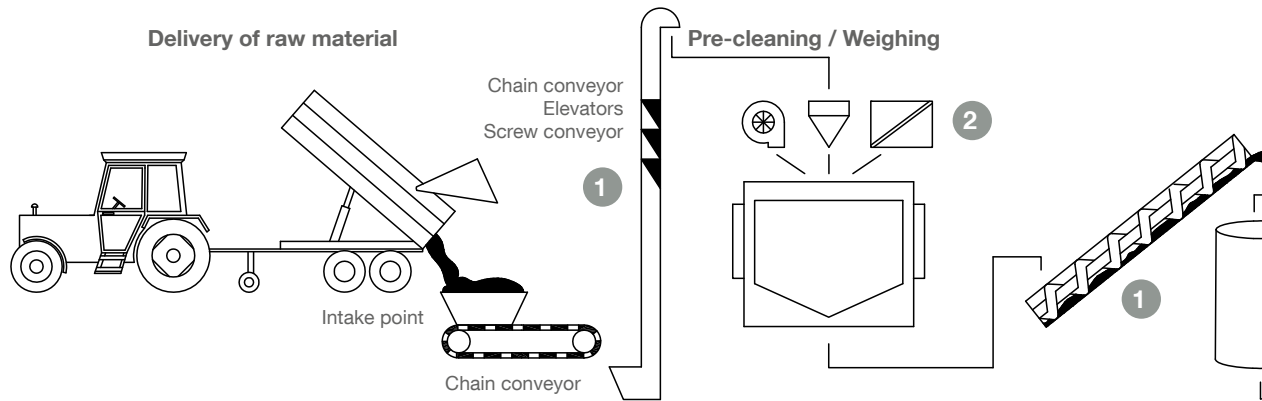
Main features

NB

NR

RN

- Measuring range up to 100m
- Reliable overflow protection
- Measurement during filling process
- Easy installation and commissioning



7 Hammer Mill

Level measurement in grinding process within hammer mill

Main features

VN

RF

MN

- Suitable for fine materials
- Abrasion resistant
- Accurate even in dusty environments
- PFA coating option available

8 Mixing / Conditioning

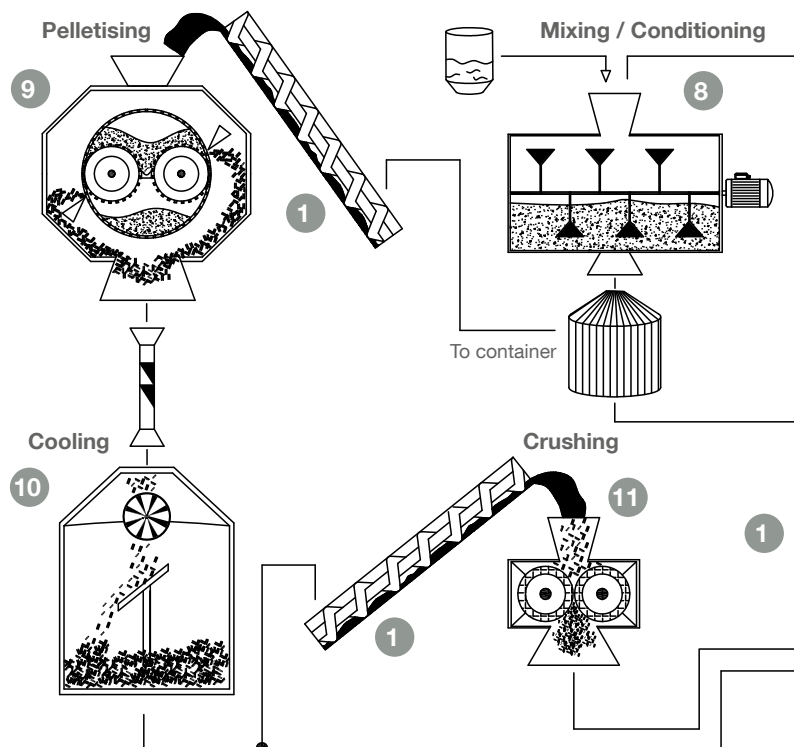
Level measurement in mixing / conditioning units

Main features

RF

CN

- Rapid reaction
- No moving parts
- "Active Shield" to prevent caking
- Adjustable signal output



9 Pelletising

Level measurement for pressed, heated pellets

Main features

RN

RF

MN

- Reliable backfill detection
- High temperature versions
- Robust design
- Certified design

10 Cooling

Level measurement for cooled pellets

Main features

RN

RF

MN

- Able to withstand severe temperature changes
- Variable extension lengths
- Easy installation and commissioning

11 Crushing

Level measurement in crushing process

Main features

RN

VN

MN

- Dustproof design
- Rapid reaction
- Suitable for fine materials
- ATEX Certification

4 Dosing / Weighing

Level measurement in dosing containers and weighing machinery

Main features

RN

CN

MN

- Precise point switching
- Rapid reaction
- Small threaded connection
- Adjustable signal output

5 Mixing

Level measurement in mixing containers

Main features

RN

MN

- Proven measuring principle in blender
- Reliable overflow protection
- Easy installation and commissioning
- Maintenance free

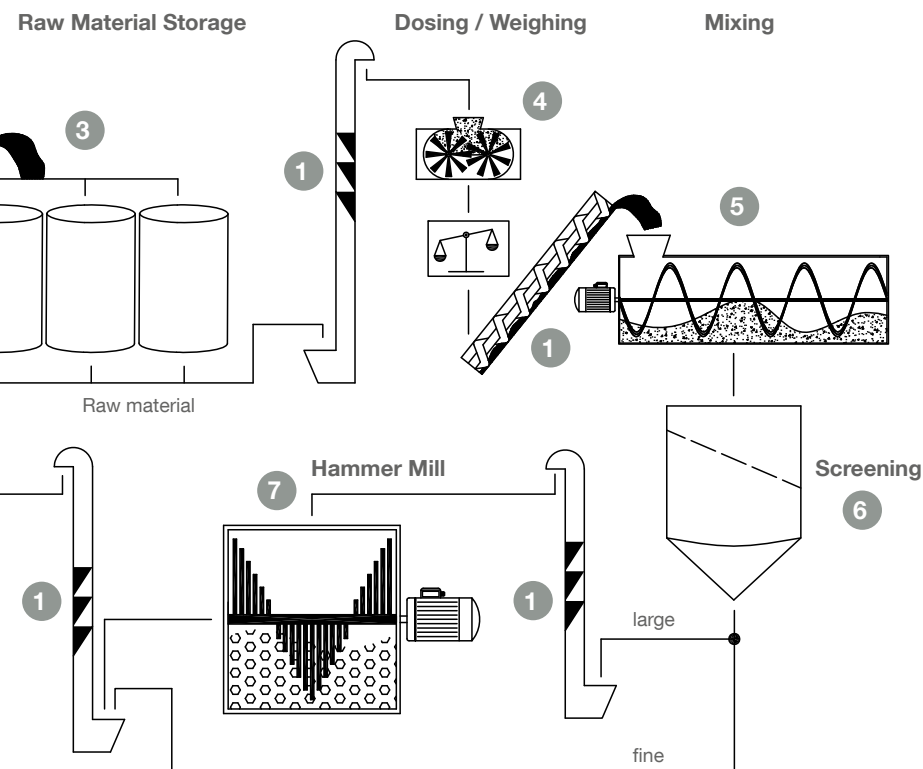
6 Screening

Level measurement in screening machinery

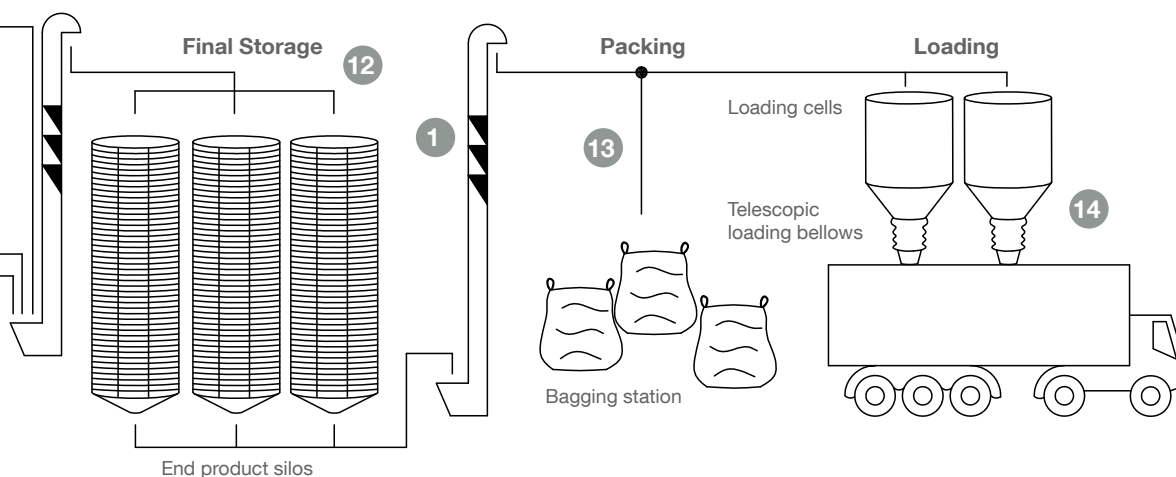
Main features

RF

- Vibration proof
- No moving parts
- Remote version
- Robust design



- RN** Rotary paddle switch Rotonivo®
- VN** Vibrating fork Vibranivo®
- MN** Vibrating rod Mononivo®
- CN** Capacitive sensor Capanivo®
- RF** Capacitive sensor RFnivo®
- NB** Electro-mechanical lot NivoBob®
- NR** Radar sensor NivoRadar®



12 Final Storage

Level measurement and overflow protection in end product silos

Main features

NB

NR

RF

- Measuring range up to 100m
- Reliable overflow protection
- Measurement during filling process
- Easy installation and commissioning

13 Packing

Level measurement during packing process

Main features

RN

CN

MN

- Compact design
- Rapid reaction
- Reliable switch off
- Maintenance free

14 Loading

Level limit detection in loading bellows and intermediate containers

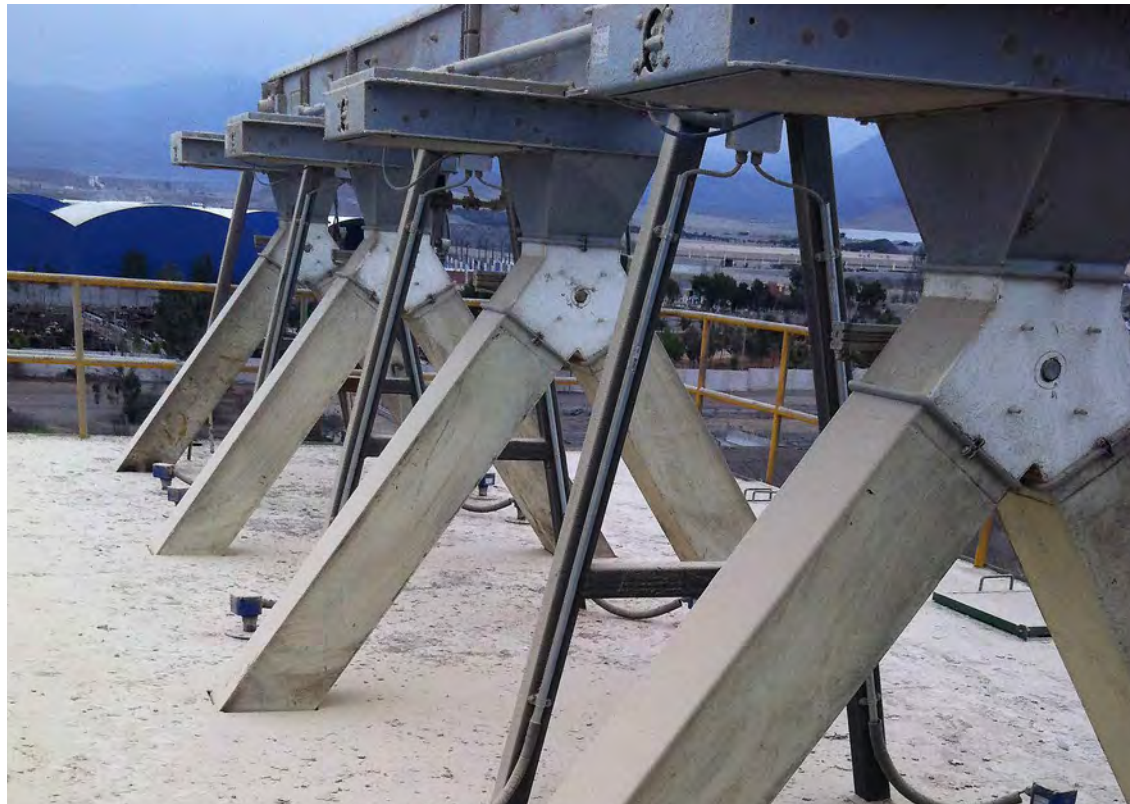
Main features

RN

- Reliable and compact sensor
- Short version for loading telescope
- Broad VT vane for high sensitivity
- Durable, high load bearing mechanics

First class sensors for smooth process operations

UWT offers uncomplicated, high-performing and absolutely reliable measurement technology at an affordable price that can be safely and easily integrated into any equipment. Our products have proven their high quality in a wide variety of animal feed process applications. In raw materials such as wheat, soybean, oilseed rape, maize, barley, rye, bran, molasses, mineral feed, oats, millet, legumes, skimmed milk powder, grass meal, corn gluten feed, en route to the final product within differing process plants and processing stages.



Storage Processes

Requirements met by UWT:



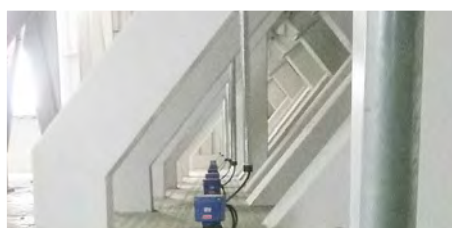
- ✓ Large measuring distances in tall silos
- ✓ High accuracy despite large diameter of container
- ✓ Complete tailor-made system
- ✓ Rapid reaction to overfill protection required
- ✓ Precise measurement results despite highly dusty environments
- ✓ Sufficient sensitivity for measurement in fluidised products
- ✓ Level measurement in steep sided cones
- ✓ Effective silo management
- ✓ Complete system for level monitoring with visualisation



The main processes involved in the production of feed are storage, weighing and mixing with conditioning, pelletising, followed by cooling and crushing. There are also other processes such as extrusion, conveying and dosing applications. UWT level technology is used in almost all sectors, for level indication or to control limit levels for all bulk solids. With this reliable sensor technology, an important contribution is made to make these processes safer and so operate at an optimal level.



The right technology for level monitoring and overfill protection



Your partner for varying storage processes

In order to ensure a continuous supply chain, both the raw and the finished product must be clearly and properly stored.

It all starts with the raw materials to be transported and stored in raw cells (silos) once delivered, weighed and cleaned. The materials remain there until further processing. The end products such as the pelleted or flour-like finished feeds are stored in finished feed cells until delivery.

The UWT sensor used during warehouse processes is mainly for level measurement and overfill protection. Here UWT's simple electromechanical measuring system has proven itself in practice as a full detector for continuous level measurement. This durable technology is considered an all-rounder in all materials and delivers a consistently reliable level signal.

In combination, the visualisation system, NivoTec®, can be used within the storage silos to detect the levels remotely, analyse trends and round off the logistics management system.

Your partner for different processes within bulk material handling

Throughout the whole process of animal feed production, there are as well as raw material storage, storage processes, subse development processes in between, and at each stage level detection of the bulk solids is required. In every intermediate container th processing involving varying types of pre-hopper, tempering cells or surge hoppers where ingredients for adding and mixing are sto



Intermediate Containers

Requirements met by UWT:



- ✓ Short reaction time to the overfill protection and rapid detection of low-level control for small transfer containers
- ✓ Accurate measurement results even within dusty environments
- ✓ High temperatures
- ✓ Varying types of bulk materials
- ✓ Resistant to caking caused by moisture within the application
- ✓ Varying extension lengths required
- ✓ Output signal with timing control



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Conveying and Downpipe Processes

Requirements met by UWT:



- ✓ Level switches in pressurised vessels
- ✓ Restricted space within pipes and shafts
- ✓ Adjustable sensitivity
- ✓ Abrasiveness of bulk solids materials
- ✓ Material flow suppression with simultaneous safer backflow signalling
- ✓ Small process connection



**Monitoring of limit levels
even in confined spaces**

mediate containers such as those found here, the measurement technology installed should be robust and be resistant to extreme
ures. For applications with very high ambient temperatures, UWT can offer device versions that operate in conditions of up to

ed production, the free-flowing bulk goods are transported either mechanically using chain conveyors, elevators, screw or pneumatic
rs by one manufacturing process to another. Here, controlled material flow is essential to ensure an effective production process.
different devices offered by the UWT portfolio of products there is a sophisticated solution for the detection and monitoring of
solids in varying bulk transport systems for almost every application. Faults in conveyor systems for raw material, pellets and other
materials are detected early through the use of appropriate measurement principles thus any consequential damage is reliably avoided.

Your partner when weighing, dosing and mixing

UWT measuring technology will always provide a professional solution in terms of precision and process reliability to support a mixed feed production facility. In order to optimise the precise weighing and dosing of varying materials, it is vital that the measuring devices offer adjustable sensitivity. As a result, UWT sensors easily detect DK values from 1.5 or bulk density below 5g/l (0.3lb/ft³). Through the flexible adjustment of the device to adapt to the varying conditions the level of automation of the weighing/metering process is effectively increased.

Weighing / Dosing

Requirements met by UWT:

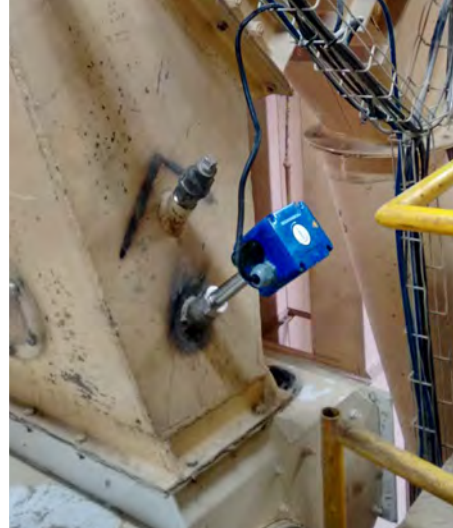


- ✓ Level detection in changing media
- ✓ Pinpoint accuracy
- ✓ High sensor sensitivity to facilitate swift volume dosing
- ✓ Flexible extension lengths for varying switching points within the dosing process



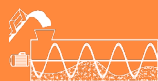
During the mixing and conditioning process there takes place a steady blending of mixed feed components, intense steam saturation and the addition of liquid components.

Therefore, the anti caking technology, as found within the capacitive sensing devices, is of critical importance. The integrated “Active Shield Technology” ensures, even with very sticky, floury whole grain type or a viscous mix, uninterrupted compound feed production which is of a consistently high quality.



Mixing / Conditioning

Requirements met by UWT:



- ✓ Reliable detection of varying types of bulk solids materials
- ✓ Ability to compensate for agitated/changing surface of the bulk solids via delayed output signal of the measuring device
- ✓ High throughput capacity
- ✓ Ability to withstand high condensation and dusty environments
- ✓ Resistance against aggressive bulk goods
- ✓ High temperatures within the application
- ✓ Guarantee of sufficient sensitivity
- ✓ Long life guarantee to withstand high number of switching cycles required
- ✓ Heavy build-up/caking



**We will detect your
precise mixing blends
according to the
production plan**

Hammermills

Requirements met by UWT:



- ✓ Strong vibrations within the process
- ✓ Continually precise measurements - regardless of material properties
- ✓ Ability to detect abrasive media
- ✓ Partial fine grained bulk solids
- ✓ Highly dusty environments
- ✓ Explosion protection
- ✓ Robust device design
- ✓ Varying installation positions as required
- ✓ Maintenance free technology



An extensive product portfolio of innovative measurement technology allows us to equip any desired process area for a variety of measurement tasks.

All UWT sensors have an output performance rating of nearly 100% and are completely maintenance free. Therefore, they are good investments in order to maintain 24 hour a day production.

The product portfolio contains worldwide certified designs and includes both EHEDG versions for hygienic applications as well as sensors which carry the approvals according to ATEX, IEC Ex, FM, etc. directives.

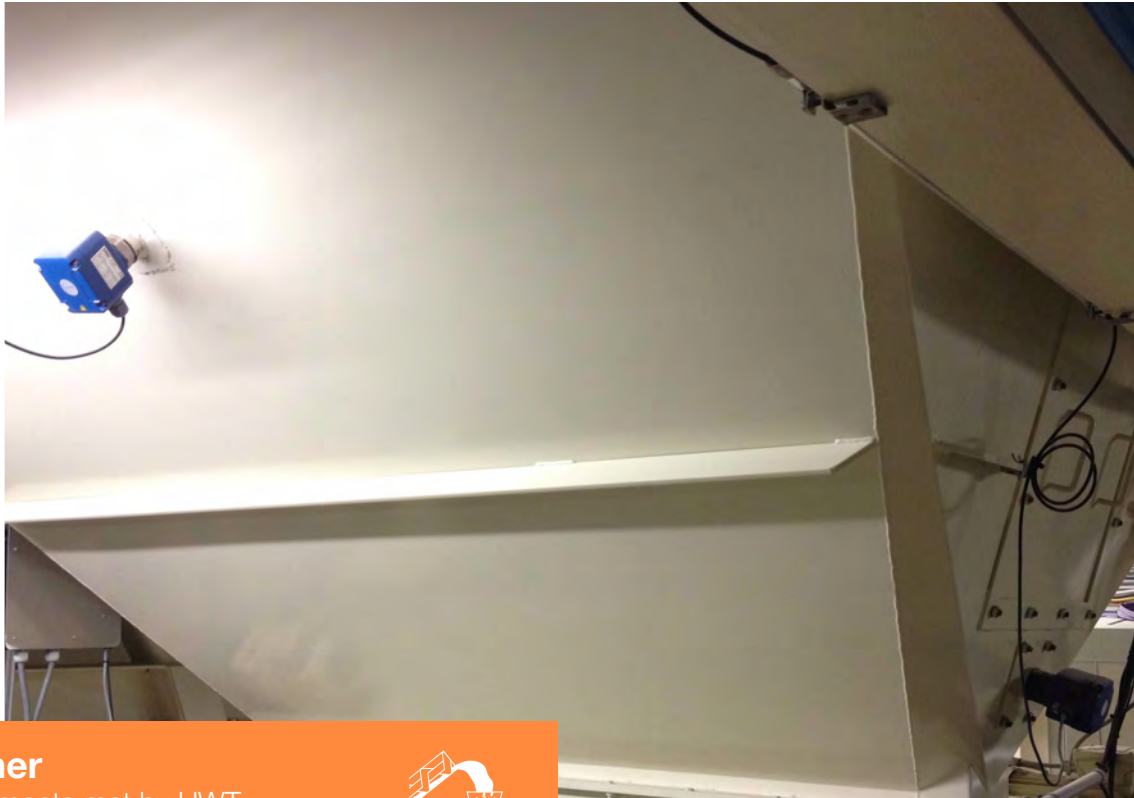
The devices therefore guarantee global plant safety via their certified designs.

Competence in product development,
application **experience** and professional **advice**

Your partner for the milling process

To ensure an entirely customer focused solution, UWT provides a wide range of product lines so that the individual processes can run smoothly according to their work rate.

For example the rotation principle and the capacitive method are most suitable level monitoring solutions for the crushing or grinding process as found in hammer mills. With their corrosion resistant construction and totally dust-proof design, the rotary paddle switch and capacitive limit switches have regularly proven their reliability within aggressive environments. Both are available in different versions and can be easily integrated in limited or awkward spaces.



Crusher

Requirements met by UWT:



- ✓ Highly dusty environments
- ✓ Varying particle/grain size
- ✓ High number of cycles in rapid flow
- ✓ Low bulk density requiring high sensitivity
- ✓ Quick response time
- ✓ Safe sensor function within statically-charged environments
- ✓ Explosion proof
- ✓ Short version



Your partner in the pelleting process

Around the world, customers appreciate us as a specialist for individual economic solutions. We aim to produce measurement technology for every particular requirement. Whether for fluctuating bulk density, bridging, caking, abrasiveness, rapid response time, high tensile and leverage, high and low process temperatures and pressures etc.



Pelleting

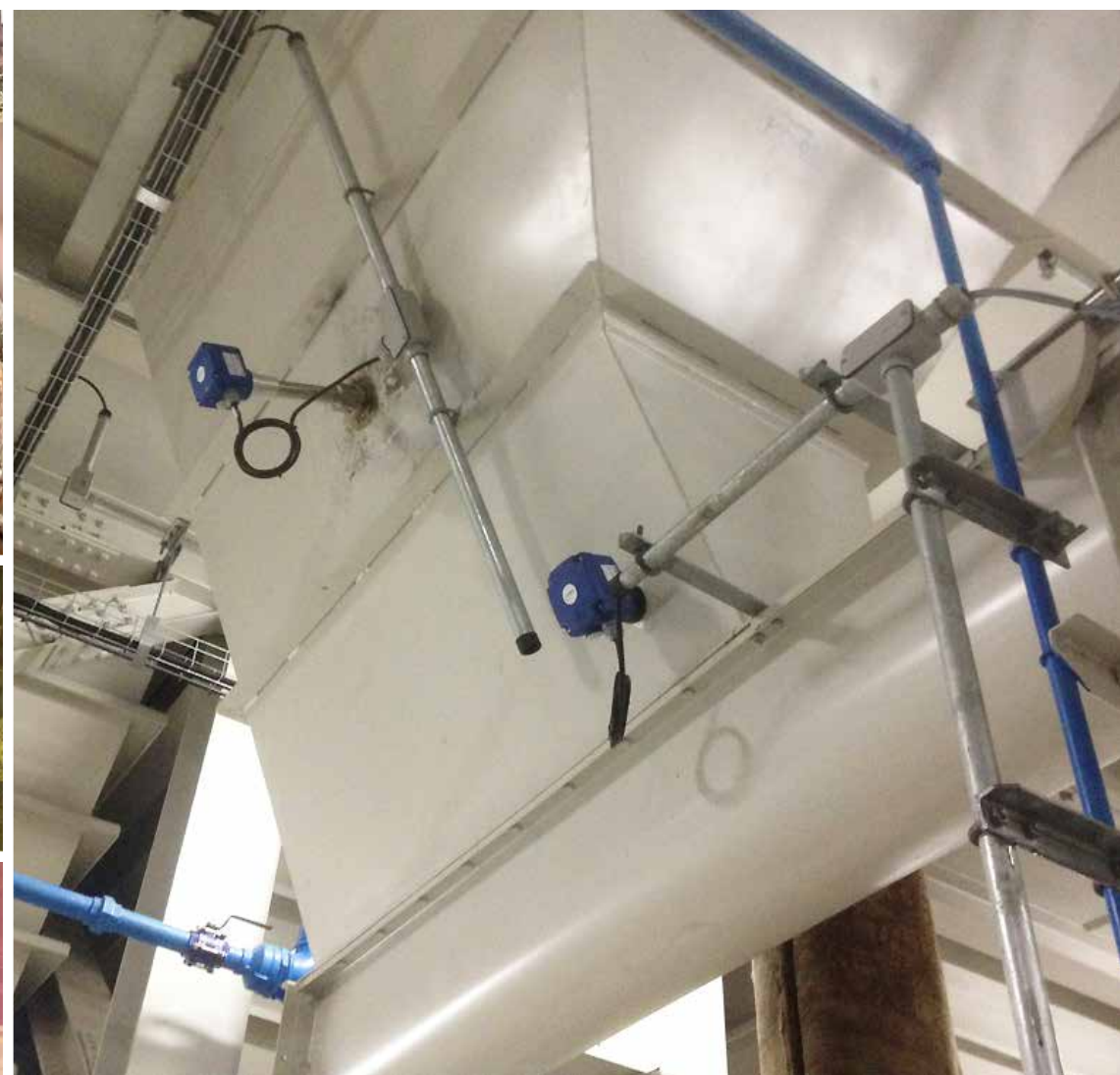
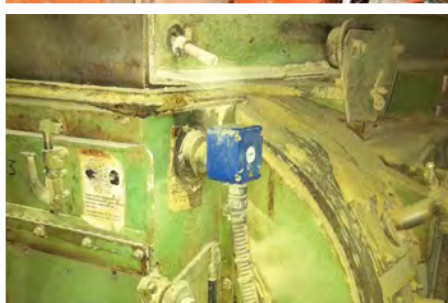
Requirements met by UWT:



- ✓ High temperatures
- ✓ Humid/damp and dusty conditions
- ✓ Vibrations within the processing stage
- ✓ Expanding and extruding influences such as humidity, temperature and pressure of the material
- ✓ Devices with totally reliable sealing
- ✓ Hygienic applications with clean procedures
- ✓ Active technology to deal with extremely sticky and heated bulk materials
- ✓ High load bearing
- ✓ Durable measurement technology



Measurement technology needs to overcome such challenges as these especially during the pelleting process. With our tailor-made concepts and powerful technology we are able to ensure the smooth operation at this process stage during the manufacture of feed. Also, we focus hard on making sure our products are readily available for this purpose.



Our focus is on **reliability**, superior **quality** of the sensor together with a **flexible** approach towards **customer requirements**

Your partner in the cooling process

At the crucial cooling process of the feed, the equipment must handle hot then cold material. After the pelleting process, the hot pellets are cooled down to an appropriate temperature. Therefore, the demands on the installed measurement technology principle can be problematic.



Cooling

Requirements met by UWT:



- ✓ Temperature fluctuations
- ✓ Functional reliability against condensation and caking
- ✓ Simple measurement principle
- ✓ User friendly installation and commissioning
- ✓ Precise measurement results within electrostatic environments
- ✓ Various shaft lengths
- ✓ Maintenance free





In order to handle the extremes in temperature, UWT has integrated small heating elements into the electronics of their measuring instruments. Thus, the sensor is carefully adjusted to the dramatic change in temperature, which allows accurate switching circuit without the result being adversely affected.

UWT units feature special coatings for different shafts - so devices may have the stainless steel option 1.4404 (316L) together with the option of Teflon seals.

Continuous improvement processes ensure our products are of a consistently high quality. To ensure long service life of the equipment, only highly resistant materials are used throughout the series. In addition, each model undergoes a 100% function test including HV-PE Test.



With application-related product design, responsive service and short delivery times, we do our part to provide a product solution within a plant concept

Your partner in packing and loading

Our creative team will configure specifically tailored sensors for your process specifications.

For packing and loading processes, our portfolio offers reliable devices for the demand signal when filling and flexibly adjustable limit switches for loading cells.



Packing

Requirements met by UWT:



- ✓ Spillage detector required within restricted space in the container
- ✓ Rapid response time to overfill protection for small transfer containers to large bags
- ✓ Robust design required due to frequent transfers of material into Big Bags
- ✓ Reliable detection of varying media required
- ✓ Restricted space within the process for siting of sensor
- ✓ Maintenance free technology



Sophisticated measurement solutions provide a **continuous** process flow

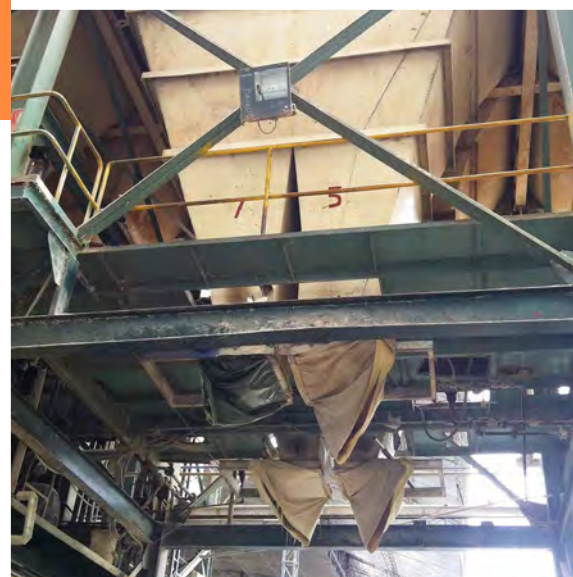


Loading

Requirements met by UWT:



- ✓ Detection of changing media
- ✓ Measurement during tank filling
- ✓ Rapid reaction by sensor
- ✓ Accurate measurement in dusty environments
- ✓ Extra short version within loading telescope
- ✓ High mechanical loading
- ✓ Durable functioning principle
- ✓ High sensitivity of measurement technology
- ✓ Easy installation



The most important DK values at a glance

The relative dielectric constant (DK value) of solid media is a decisive factor for determining a suitable measuring principle in level measurement. UWT has provided a table below showing the DK values of the main substances used in the feed industry.

The DK values below are to be regarded as a guideline only. They are applicable to capacitive level limit switches and for measurement using radar sensors.



Medium	DK Value	Bulk Density g/l
Cereal grain	3	600
Maize/corn	3.6	770
Malt	2.7	450
Molasses	33.3	1350
Oat	4.9	500
Rapeseed	3.3	560
Rye	6	650
Rye bran	2.2	270
Skimmed milk powder	2.2	350
Soy bean meal	2.9	520
Water	80	1000
Wheat	4	800
Wheat bran	1.5	290





UWT measuring technology
with adjustable **sensitivity**
for varying bulk materials



Experts in innovative measuring technology since 1977.

We design reliable **solutions** and long-lasting products,
tailor-made according to the **needs** of our customers.



UWT - Your global partner for the future

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