

5 YEARS WARRANTY

Food industry instrumentation

APPLICATIONS FOR FOOD AND BEVERAGE



INVELCO

FOOD INDUSTRY

FROM CANNING ... TO FEED INDUSTRY

The wide range of NIVELCO instruments can be applied advantageously in the instrumentation requirements in various manufacturing processes of the food industry having various technological processes. A portfolio of instruments offered for measurements of this market include rotary paddle level switches, ultrasonic and microwave level transmitters, pressure transmitters, temperature sensors and transmitters and advanced liquid analytical instruments. Small and medium sized systems are easy to set up using NIVELCO's MultiCONT process controllers that can read the measured values and program NIVELCO transmitters remotely. Alternatively the NIVISION software can be used to integrate NIVELCO transmitters into a process visualization system. Hereby we present some typical food industry applications of NIVELCO instruments in the following flow-charts.

PiloTREK – non-contact Microwave

MicroTREK – guided Microwave

EasyTREK – ultrasonic integrated

EchoTREK – ultrasonic compact

NIVOCAP – capacitive

NIVOPRESS D – hydrostatic

NIVOTRACK – magnetostrictive

NIVOFILIP – bypass liquid level indicator

NIVOFLOAT – float switch

NIVOCONT K – conductive

NIVOMAG – magnetic coupling

NIVOSWITCH – vibrating fork

NIVOCONT R – vibrating rod

NIVOROTA – rotary paddle

NIVOCAP CK – RF capacitance

AnaCONT LEP / LER – pH & ORP

AnaCONT LED – dissolved oxygen

AnaCONT LCK – conductivity

LIQUID ANALYTICS



POINT LEVEL DETECTION

CONTINUOUS LEVEL MEASUREMENT



FLOW MEASUREMENT

PRESSURE MEASUREMENT

TEMPERATURE MEASUREMENT

NIVOSONAR – open channel flow meters

ISOMAG – magnetic induction

NIVOPRESS D – hydrostatic

NIPRESS D – pressure transmitter

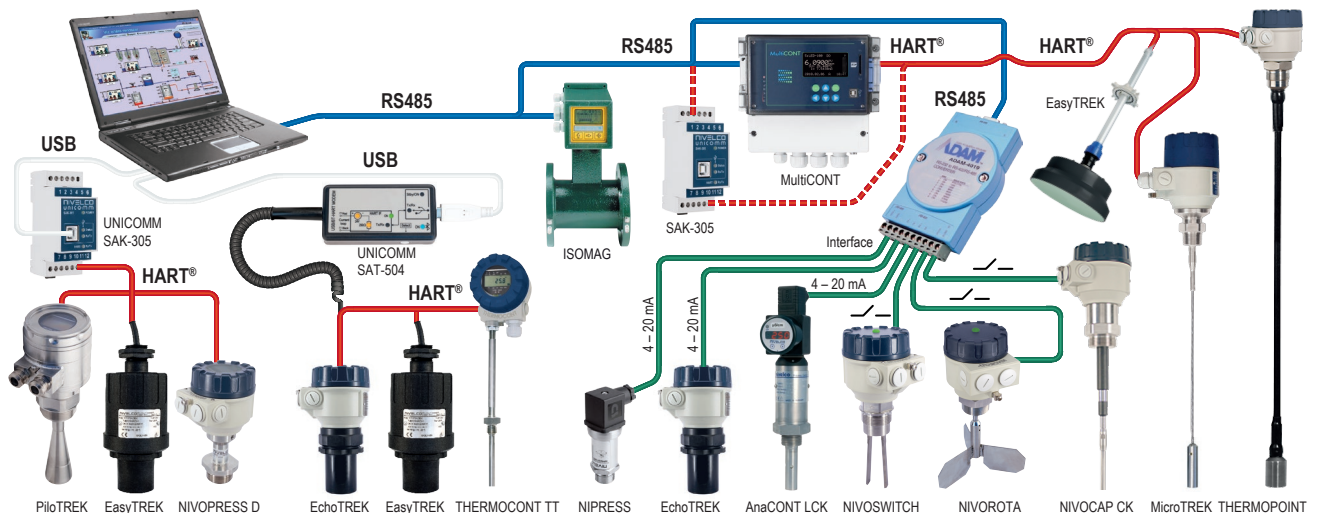
THERMOPOINT – multipoint transmitter

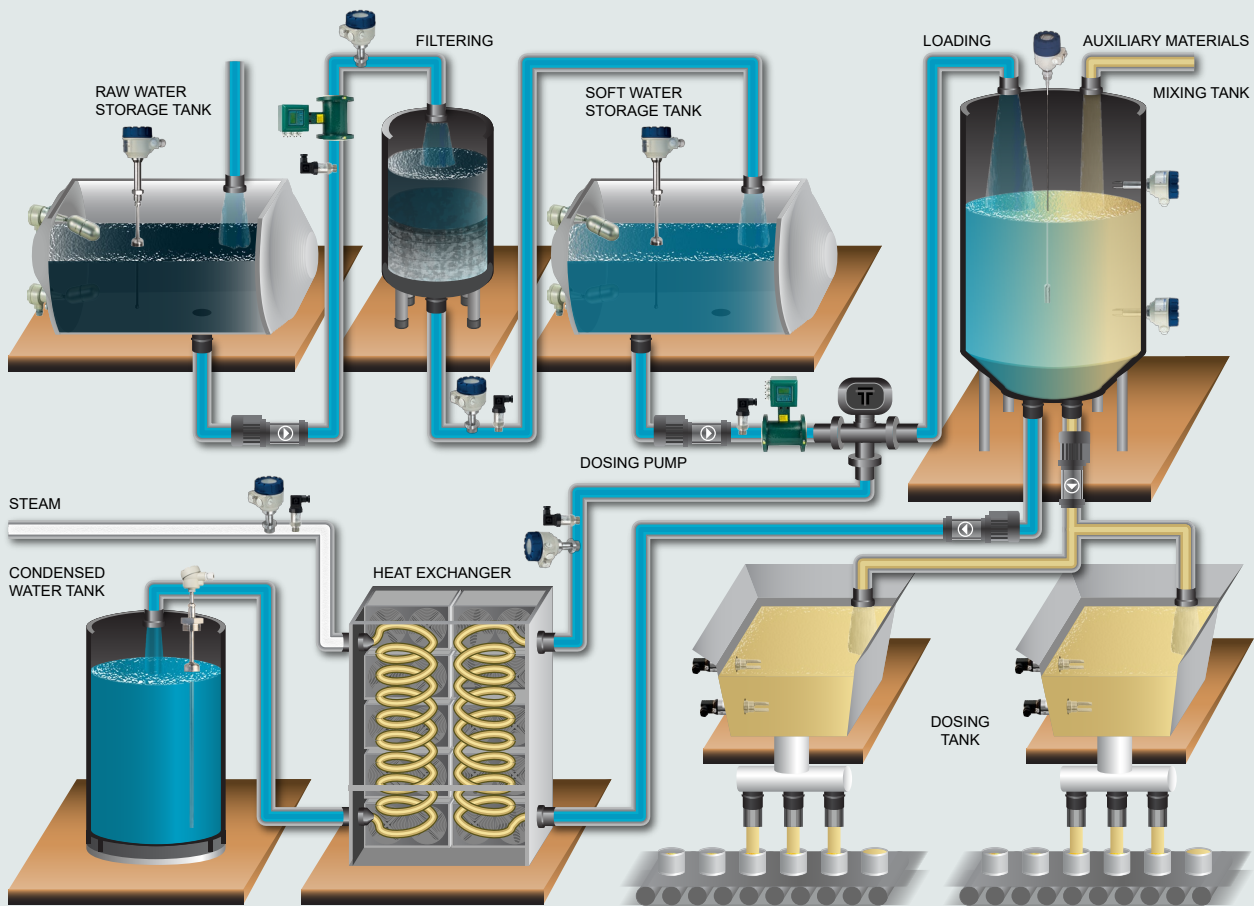
THERMOCONT TT – transmitter

THERMOCONT T – temperature sensor

FIELD INSTRUMENTS IN MEASUREMENT SYSTEMS

All NIVELCO transmitters can be connected to the MultiCONT process controller, or with the help of suitable interfaces, NIVELCO field instruments can provide measurement results and control signals directly to the process control system. NIVISION software provides a perfect choice for process visualization, data collection, database management and process control tasks.





SOFT WATER PRODUCING

The production of the filling liquid used inside the cans is an important step of the manufacturing process considering its effect on the final product. The raw water is pumped into the filter and after filtering treatment it is transferred to the soft water tank. For flow measurement of the soft water ISOIL MS□□/ML210 electromagnetic flowmeter with batch function can be used.



MIXING TANKS

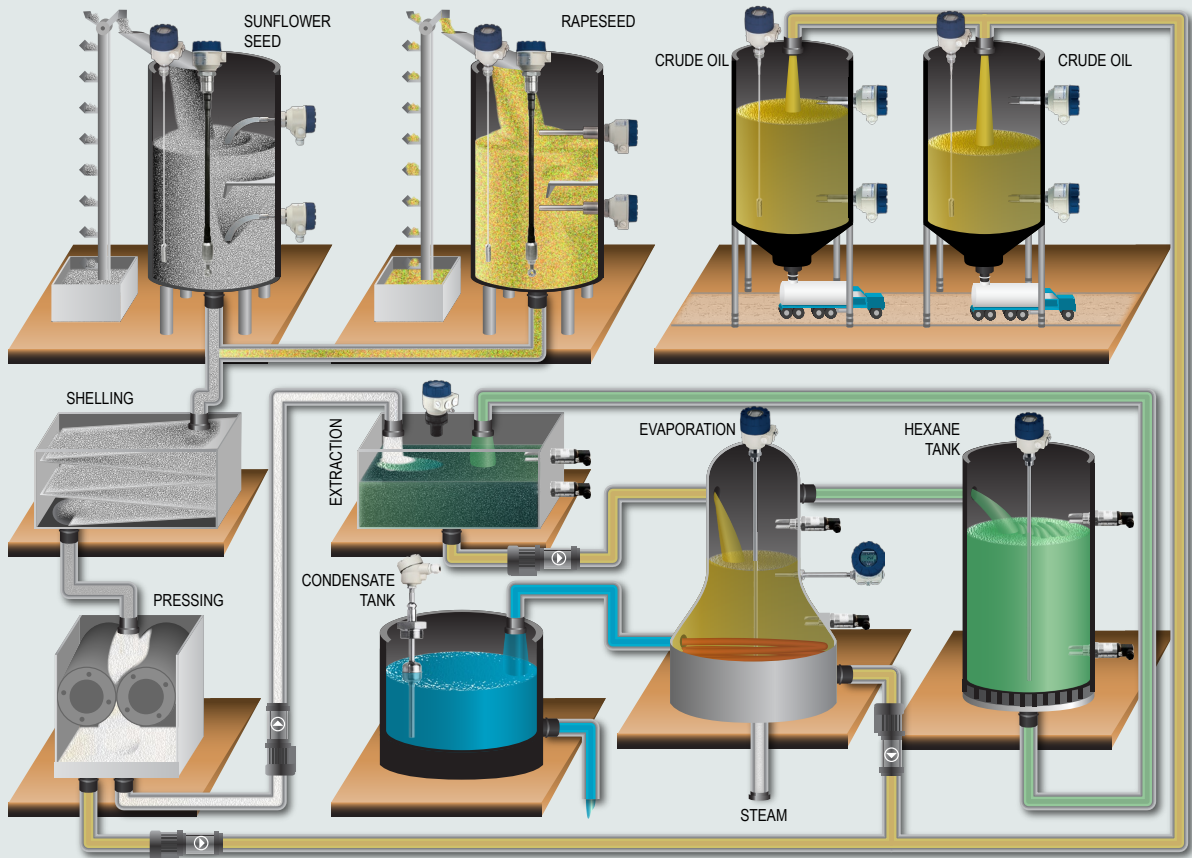
The filling liquid is produced in mixing tanks where the processed water and the auxiliary materials (e.g. salt, sugar, spices, etc.) are added. Sterilization of the filling liquid is done by circulating it in heat exchanger tanks at +90 °C (194 °F) temperature. Continuous temperature measurement in the primary and the secondary side of the heat exchangers can be done with THERMOCONT TJJ-521-2 type temperature transmitters.



Continuous level measurement of the mixing tanks can be done with MicroTREK HHQ-413-4 type guided microwave level transmitters. Types with different process connections and fully PFA coated probes are available to satisfy food industry's high hygienic requirements. After mixing the liquid is transferred to the dosing machine and then dosed into the cans.



EDIBLE OIL PRODUCTION



RAW MATERIAL STORAGE

Edible oil is produced from oil-seeds (for example sunflower- or rapeseed). In the raw material storage continuous level measurement is necessary with **MicroTREK HTN-400-6Ex** guided microwave level transmitters. For low/high level indication we recommend **NIVOROTA EKH-700-5Ex** rotary paddle, or **NIVOSWITCH RRH-300-BEx** vibrating fork level switch.



CRUDE OIL STORAGE

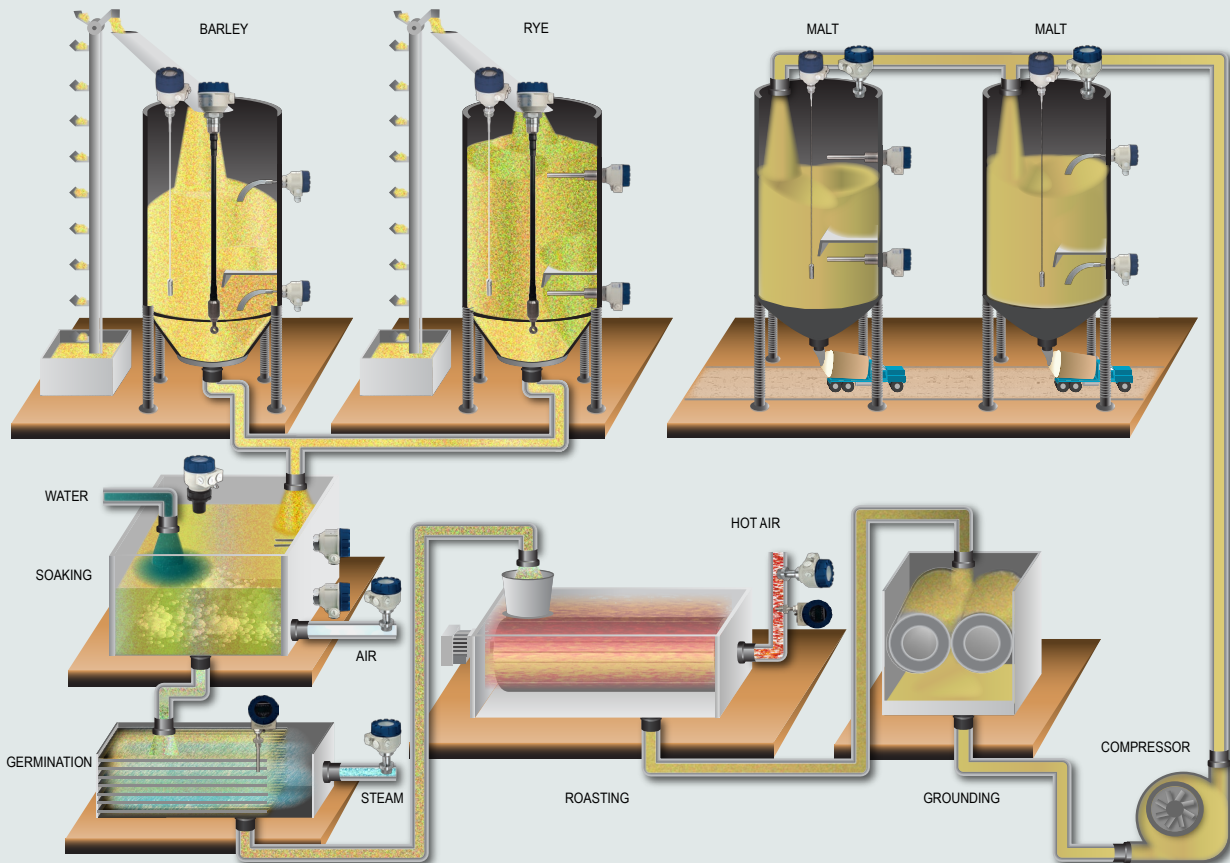
After shelling (removing the husk) during the primary pressing approximately 70% of the oil content can be extracted from the oil-seeds and stored in crude oil storage tanks. The pressed "seed-cakes" are treated with solvents in the Extractor and then the solvent is transferred to evaporation. Level measurement in crude oil storage can be done with **MicroTREK HTN-400-4** guided microwave level transmitters. For low/high level indication **NIVOSWITCH RCM** or **RFM** vibrating forks can be used.



EVAPORATION

The evaporation process separates the oil from the solvent resulting that the remaining seed-mud has only 1-2% oil content. The processed oil is filled into the crude oil storage tank. The most important parameter to be measured and controlled is temperature. It can be done using **THERMOCONT TTJ-511-6Ex** temperature transmitters and **UNICONT PMG-400** universal controllers. **NIVOSWITCH RCM-401-8Ex** vibrating fork level switch is recommended for low/high level limit indication.





MALT PRODUCTION

Malt is the most important raw material of beer and whisky. Malt production is based on grains (barley, wheat, rye, etc.). Main technological processes are the following: soaking, germination, roasting, grinding. In this production phase silos of raw material, end product or other technological units can be equipped with level instruments.



RAW MATERIAL SILOS

For level measurement of these silos NIVELCO offers again **MicroTREK HTN-400-6Ex** guided microwave level transmitters. If multipoint temperature measurement is required in the silos this can be done with **THERMOPOINT TMM-500-5 Ex** series multipoint temperature transmitter. Values measured by **THERMOPOINT** can be displayed and stored on a PC. Systems can be set up with **MultiCONT PRW-200** multichannel process controller or **UNICOMM SAK-305 HART®-UBS/RS485** modem.

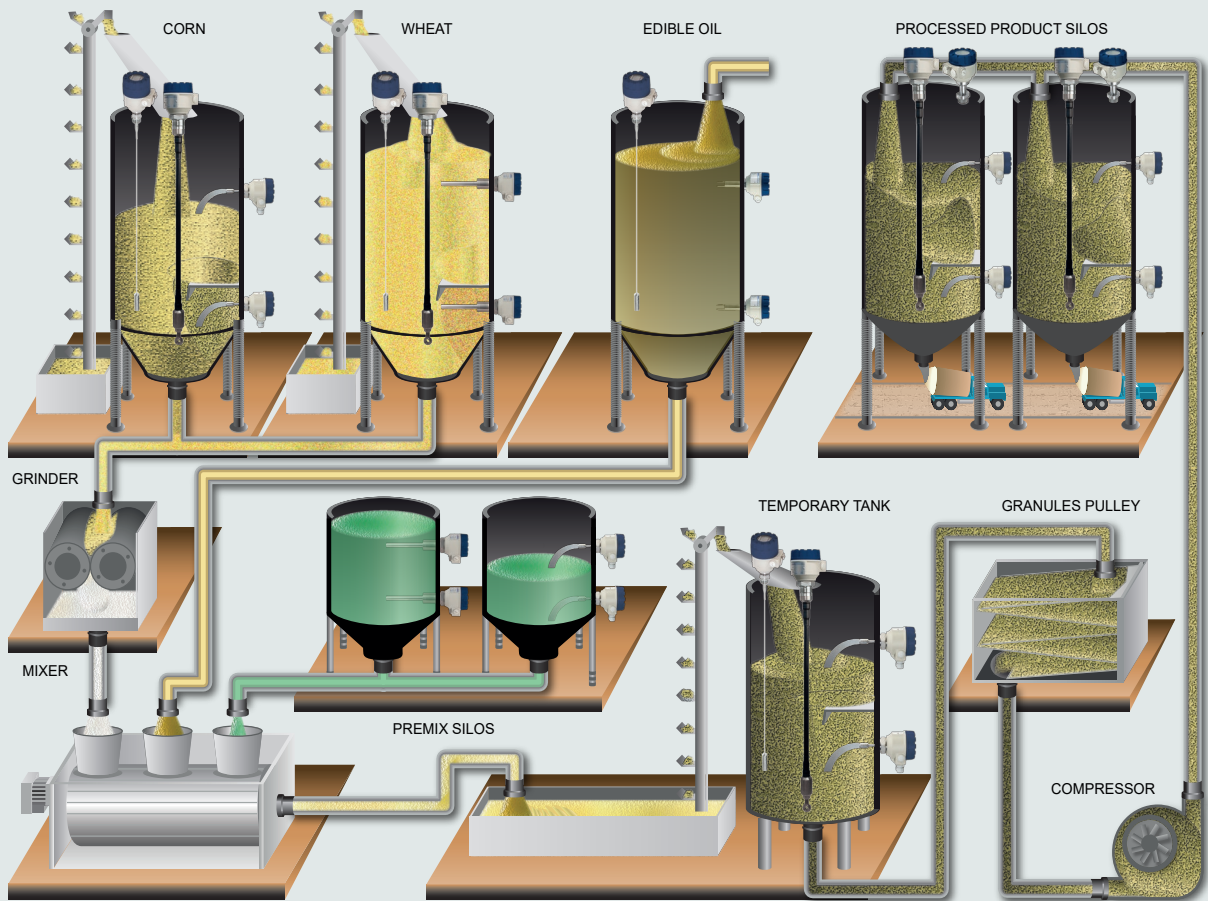


END PRODUCT SILOS

Filling finished products into the silos usually is done by pneumatic filling. These silos need continuous level measurement and high/low limit indication too. Overpressure inside the silos should be prevented so continuous pressure measurement is done with **NIPRESS** pressure transmitters and **UNICONT PMG-411** universal controllers stop the filling process when high pressure is sensed.



FEED PRODUCTION



FEED PLANT

The processed animal feed is the most important raw material used in livestock farms to ensure the required vitamin intake and the balanced weight gain in the animal care sector. Main mechanical equipment of a fodder mixing plant are as following: stock storage silos (wheat, corn, edible oil), mill (grinder), premix storage tanks, mixing equipment (according to recipe), storing powder mixture, granular products and feed mill granulation.



STORAGE TANKS

In the stock storage-, premix-, processed end-product silos continuous level measurement can be done with MicroTREK HTN-4□□-6Ex type guided wave radar level transmitters. For pressure monitoring above the stored products in pneumatic filled tanks we recommend NIPRESS pressure transmitter and UNICONT PKK-312-5Ex limit switch.



Indication of full or empty status with high/low fail safe limit switches can be done with NIVOSWITCH RCM-401-3 or NIVOSWITCH RFM-401-0 type vibrating fork level switches. Recommended multipoint temperature transmitter is THERMOPOINT TMM-5□□-5Ex type with HART® output. The measured values and alarms can be displayed on a MultiCONT PRW multichannel controller or on PC through UNICOMM SAK-305 HART®-USB/RS485 modem.



INSTRUMENT SELECTION



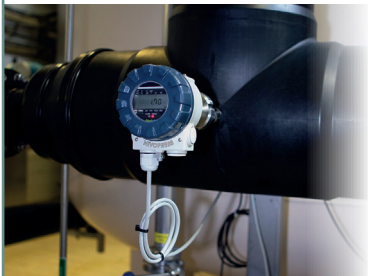
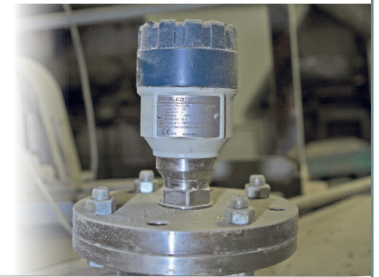
PiloTREK – Non-contact microwave transmitters

- Non-contact level measurement of liquids, slurries, emulsions
- For high pressure, high medium temperature
- Sanitary types for meeting high hygienic requirements with PTFE antenna enclosure and TriClamp process connection
- For high precision level measurement tasks
- Measuring in plastic tanks from outside through the tank wall



MicroTREK – Guided microwave transmitters

- Distance, level and volume measurement
- Liquids, powders and granular mediums with $\epsilon_r \geq 1.4$
- Stainless steel, FEP, PFA or PP coated probes
- Medium with turbulent surface, dense dust, vapour or pressurized gas layers above the product surface
- For all tank shapes, for narrow vessels



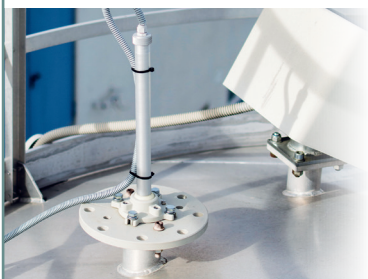
NIVOPRESS D – Hydrostatic pressure transmitter

- Hydrostatic level/pressure measurement
- Measurement of liquids and slurries
- For foaming liquids
- Piezoresistive sensor with stainless steel flush diaphragm
- Hygienic versions with Triclamp or pipe coupling process connections



EasyTREK / EchoTREK – Ultrasonic level transmitter for liquids

- Non-contact level measurement of liquids and slurries
- Level, volume or weight calculation and display
- Narrow 5° beam angle
- PP, PVDF, PTFE or Stainless steel transducers
- Open channel flow metering



EasyTREK / EchoTREK – Ultrasonic level transmitter for solids

- Non-contact level measurement of solids
- For normal or dust explosive materials
- Level, volume or weight calculation and display
- Wide application range: light powders to coarse bulk solid materials
- Reliable measurement in challenging applications such as dusting during filling



NIVOTRACK – Magnetostriuctive level transmitter

- Custody transfer measurement
- Liquids with min. 0.4 kg/dm³ density
- For normal or dust explosive materials
- Supplementary level transmitter for NIVOFLIP magnetic flip indicator
- OIML R 85 international certification
- For high-accuracy measurement





NIVOSWITCH – Vibrating fork level switch

- Level switch of liquids, powders, granules
- For low/high fail safe limit switch
- Hygienic versions with Triclamp or pipe coupling process connections and 0.5 micron fine polishing
- Relay or electronic output



NIVOROTA – Rotary paddle level switch

- Wide application range in feed industry
- Level switching of granular materials and powder
- Free flowing solids with min. 0.1 kg/dm³ density
- Single or 3-vane paddles according to the density of the measured material
- For low/high fail safe limit switch



NIVOCAP CK – RF capacitance level switch

- Intelligent electronic level switch
- For solids and liquids with $\epsilon_r \geq 1.5$
- Easy calibration, selectable sensitivity
- For adhering, sticky materials
- Calibration with external magnet in hazardous (Dust Ex) environment



ISOMAG – Flowmeter

- Electromagnetic principle
- For fluid measurement in pipelines
- Stainless steel housing for food applications, with 3A certification
- Wide range of sanitary process connections
- For custody transfer measurements, OIML R 49-1 international certification



THERMOPOINT – Multipoint temperature transmitter

- Temperature measurement of powdered, granular or free flowing solids
- Average temperature measurement
- Agricultural storage silos
- Temperature trend monitoring
- Temperature data can be transferred to further processing through HART® protocol



UNICONT PM – Universal controller / indicator

- Temperature display
- Cooling / heating control
- Switching, control or transmitting tasks
- Sequence control
- Alarm signalling
- RS485 communication line to process control system

