GHMGROUP

Specialists by Competence.





Measurement technology for use in the

food, beverage, and pharmaceutical industries

Members of GHM GROUP

GREISINGER
HONSBERG
Martens
IMTRON
DeltaOHM

www.ghm-group.de

Measurement technology for the widest range of conditions

The media used, to be processed, or created in the food industry often changes properties in regard to density, consistency, conductivity, and temperature. Boilers, tanks, and similar containers are filled with the widest range of media, to which cleaning processes must be adapted and modified. GHM devices offer reliable and safe measurement for all processes.

CIP/SIP cleaning

Sensors for the food industry must be suitable for CIP and SIP processes and exterior cleaning. That means the highest demands on the housing, electronics, and sensors. This is not a problem for GHM devices, because all components can be designed specifically for the expected conditions. Process connections which are designed to eliminate dead spaces permit all methods of modern and environmentally-compatible cleaning and sterilisation.

Recommended materials for the food industry

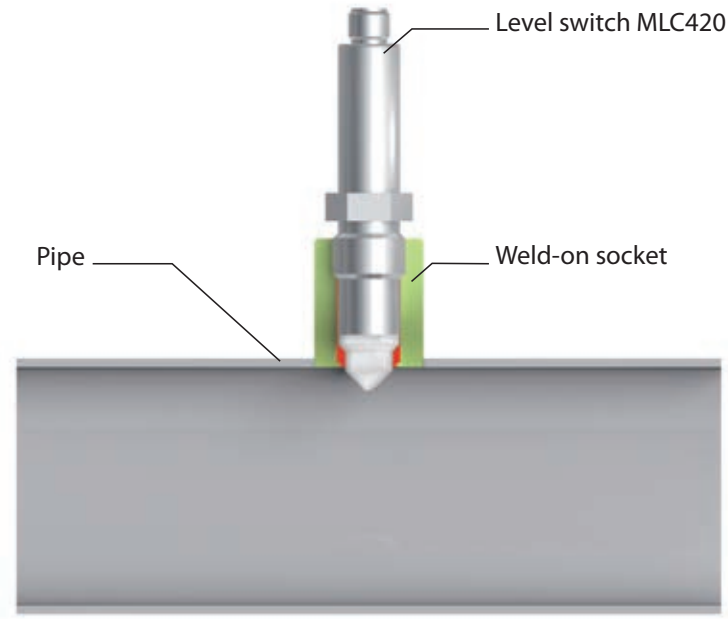
We place the highest value on the use of materials listed in accordance with the FDA, EU Regulations 1935/2004 & 10/2011 or 3A for parts coming into contact with media. All parts of sensors coming into contact with media and close to the process are capable of withstanding the cyclical cleaning and sterilisation temperatures.

CIP-/SIP-capable | Hygienic Design | FDA conform materials

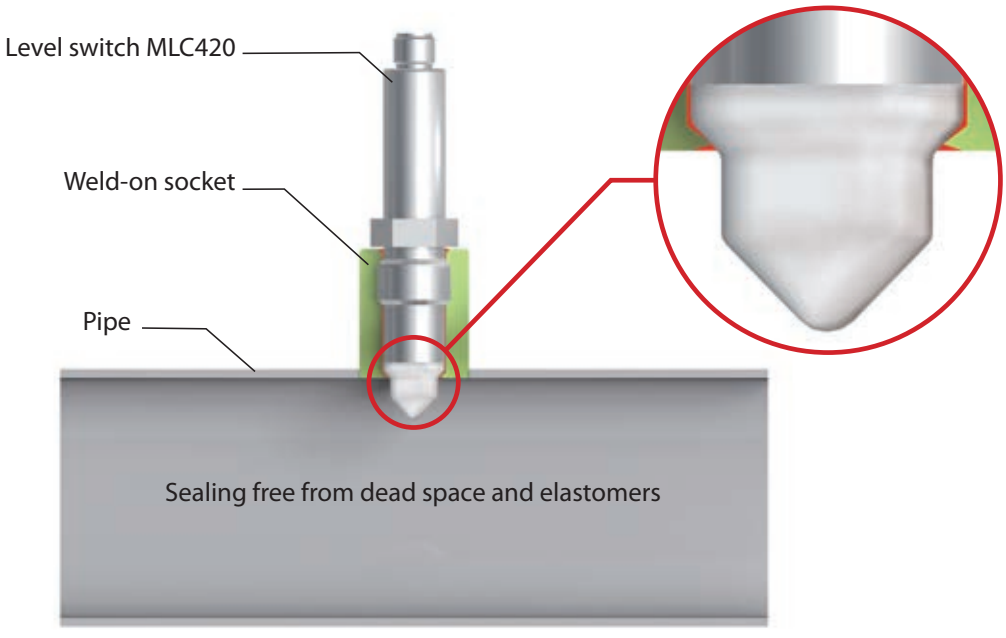
With process adaptation it is important to choose a standard-compliant hygienic process connection to the container or pipelines which is appropriate for the use. The diameter, volume, and design determine the size and type of connection, and the medium, temperature and pressure determine the possible measurement principles. We offer standard and special connections for all measuring principles that are optimised for cleaning.

GHM adapt Principle of process adaptation

CERTIFIED EHEDG HYGIENIC ENGINEERING & DESIGN GROUP EUROPEAN TYPE EL - CLASS I DECEMBER 2012



Screw-in sensor



Sensor screwed in

Benefits

- Thread sizes M12, G ½″, G ⅜″, G 1″
- Leakage hole optionally available
- Flexible modular adaptation to all common process connection types, such as: Tri-clamp, SMS, DIN 11864 hygienic connection, Varivent, DRD flange, DIN/ISO flange
- Attachment to pipes, tanks, boilers, or other containers.

M12 G ½″ G 1″

APH121 APH112 APH122 APH113 APH123

APH112 and APH for attachment to tank, boiler, and container. APH121, APH122, and APH123 for integration into pipe.

Process adapter Reducer

APHxxx AMH134*

*Reducing adapter AMH134 can also be used as an adapter for vibrating forks / vibration level switches

M12 G ½″ G 1″

APH501 APH502 APH503

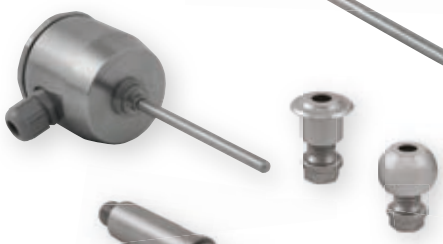
CIP-/SIP-capable | Hygienic Design | FDA conform materials

Temperature measurement (GTL)

The GLS temperature sensor series of the GHM GROUP comprises 30 different basic designs and is thus ideally equipped for every feasible application of the food, beverage and pharmaceutical sector.

M12 hygienic
GTL1 . .

G½" hygienic
(flush mounted)
GTL2 . .



Without thread
GTL3 . .

G⅜" with Union nut
GTL4 . .

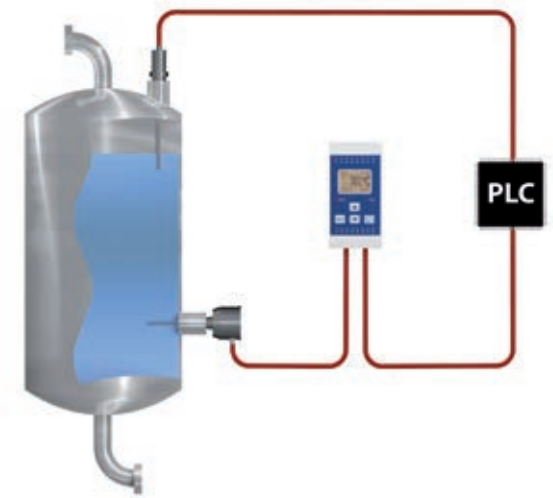
Sensors

- Temperature sensors -40... +200°C
- Optional integrated transmitter
- High precision accuracy (class A, AA)
- Available with factory calibration certificate
- Process connection M12, G ½" (flush mounted) without thread, with clamping connection or G ⅜" union nut with installation system
- Extension tube solution optionally available for high-temperature applications
- Electrical connection M12 plug connection, cable connection, or fixed cable
- Wide-ranging sensor lengths and sensor diameters
- Protection class rating IP67 or IP69K
- Stainless steel 1.4404 or 1.4435 for product contacting material

Transducer

- Conversion rate of ≤ 100 ms
- Quick reaction to minor changes
- 16-bit A/D converter
- High resolution and stability
- High accuracy
- Configuration according to customer wishes
- Configuration can be carried out by the customer using the programming tool
- Display (optional)

Temperature measurement principle



CIP-/SIP-fähig | Hygienic Design | Materialien gemäß FDA

Installation system for temperature sensors with G3/8" process connection

This hygienic system offer the possibility of installing and removing the temperature sensor (e.g. for calibration) without opening the process. It is designed for checking temperatures in closed, hygienic systems and were specially developed for our temperature sensors GLT459/479/499-0037.

Applications

- Measuring temperature in tanks, containers or pipes systems with small nominal diameters
- Measuring the processing temperature in superheated steam and pressure lines
- Monitoring of the CIP-/SIP cleaning process

Benefits

- Self-contained system without media contact of the temperature sensor
- Extremely compact measuring point with short response time
- Quick assembly and changing of the temperature sensor without subsequent cleaning cycle
- Enables calibration of the temperature sensors without any process interruption
- Easily sterilised, hygienic installation system
- All materials in product contact made from 1.4404 or 1.4435

API for angled connecting pipe

API pipe T

API

APH-Z18 / APH-G12 / APH-K25

CIP-/SIP-capable | Hygienic Design | FDA conform materials

Clamp-on temperature sensor GTL7 . .
for temperature monitoring of CIP/SIP circuits, Pasteurizers and UHT systems

- Simple, fast, and cost-efficient assembly
- Resistant to vibrations with spring seat of the sensor and fixed attachment of the adapter.
- High-temperature version for 160 °C permanent temperature
- Pipeline adapter for DN 10 - DN 80, for all common pipe standards
- Rapid response times (up to 3 s) and high measurement precision (up to 0.2 % of full scale) with integrated pipe wall correction
- Sensor interchangeability for recalibration without changing the measurement point arrangement and without process interruption
- Optimised heat transmission with 935 silver platelet
- Transmitter version configurable via GTL configurator using a programming adapter

GTL737

Tube-mounted sensor GTL 737 with LC display


GTL 737 monitors the beer temperature of a cooling system for the keg dispenser

Dual sensor

In order to enable users the possibility of simultaneous reference measurement at only one measurement point, there is also an option of setting up the measurement point as a dual sensor with two sensor inserts.
In combination with the appropriate evaluation electronics, the differential, average, larger value, or smaller value of two Pt100 temperature sensor inserts can be displayed.


GTL programming tool

CIP-/SIP-capable

Hygienic Design

Evaluation electronics

If a compact version (transducer in the sensor head) is chosen, GHM Messtechnik also offers the evaluation electronics matching the temperature sensors for the periphery.

This includes control and display devices with inputs for Pt100 / Pt1000 or thermocouples, transducers for front panel installation, top-hat rail or wall mounting, and monitoring modules.

Panel-meter
T9648

Field housing
T1010

Level switch
GS125

Temperature monitor/switch
TG50 / STL50

Transducer
MU125 / UT125

Transducer with optional Profibus
PMT50

Isolating amplifier
TV501

Isolating amplifier
TV125

Switch amplifier
TS125

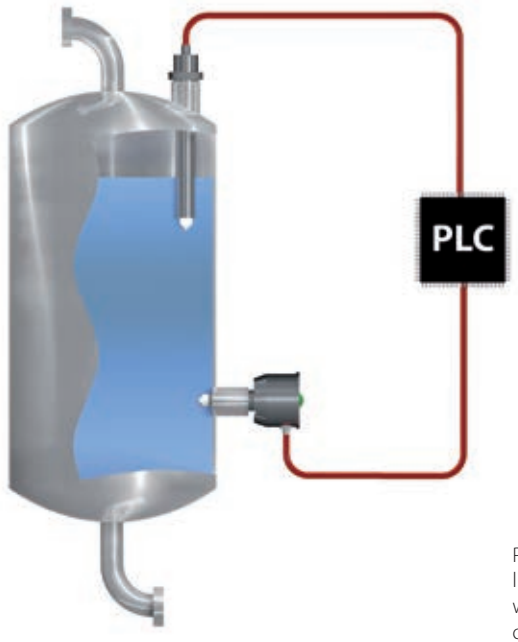
GTL programming tool

CIP-/SIP-capable | Hygienic Design | FDA conform materials | Patent Filed

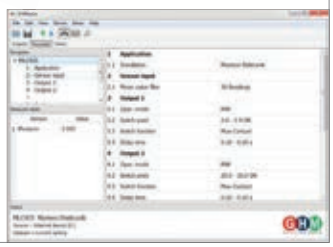
Capacitive measurement principle (MLC)

Experience gathered over many years with continuously measuring fill level sensors was drawn upon in the development of a new measurement process for level switches. Unlike established systems, no resonant circuit is used with which the medium forms the capacitor. Instead, the storage capacity of charge carriers in the medium is measured. The measuring principle is ideally suited for measurement of liquids, oils, and even solid materials, and it resistant to foaming and adhesion of products. – even with highly-viscous products. This also makes it ideally suited for pumping and dry-run protection.

Capacitive fill level monitoring



MLC430



Parameterisation of limit level switches with the GHM*ware* operating software

Benefits

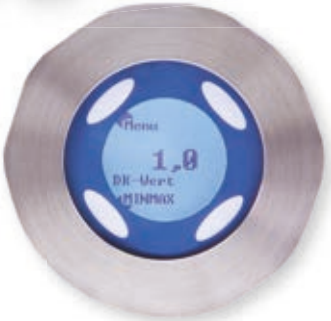
- Area of application for liquids, oils and solid materials
- Process connection G ½" and G 1" hygienic
- Quick reaction time of 0.01..10 s
- Digit-precise adjustment of the ideal switching points
- Up to 2 switching outputs can be parameterised independently of each other for the phase separation of media
- Intense LED status display
- Installation position from above in the range of 130 mm ... 1000 mm possible for tank monitoring
- Alternative to vibrating forks / vibration level switches
- Configurable with GHW*ware* via mini USB interface and/or USB programming adapter

Medium	[DK] = [ε]	Medium	[DK] = [ε]
Air	1	Wine	20 . . . 50
Oil	1.5 . . . 3	Dist. H_2O/ H_2O	79
Chocolate	2 . . . 8	Glycol	37
Acetic acid	6.2	Whipped cream	150
Ice cream	17	Beer (Pilsner)	120
Ketchup	158	Fruit juice	50 . . . 70

Programming adapter EYY120

Capacitive level switch for, e.g. highly viscous cosmetics

MLC437

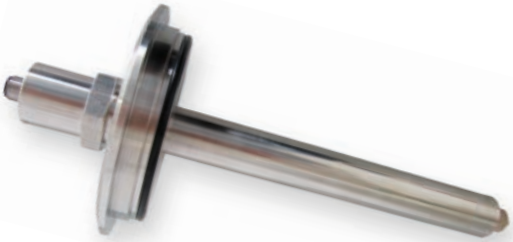


LC Display MLC437

MLC series for food and beverage industry

MLC49x

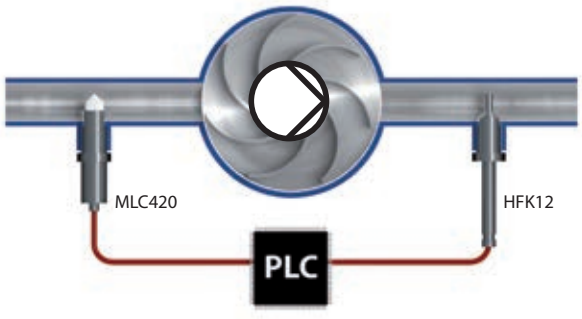
MLC42x



MLC492 in a customer-specific design with Varivent process connection

Pump protection

(dry run protection with limit level and flow monitoring)

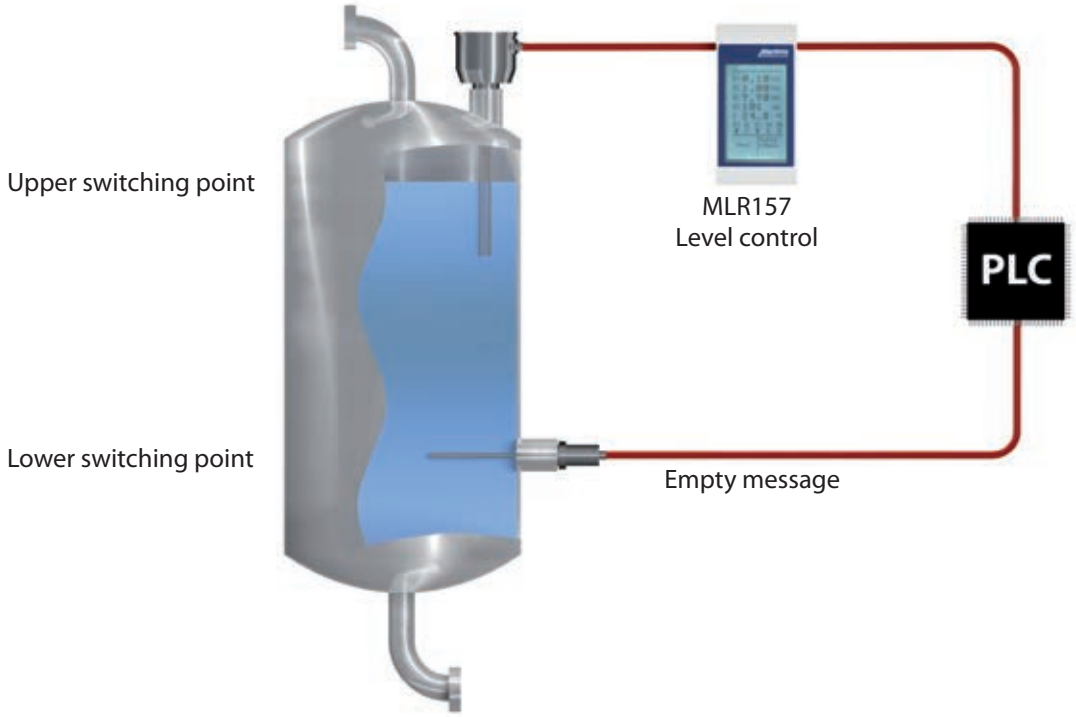


CIP-/SIP-capable | Hygienic Design | FDA conform materials

Conductive measurement principle (SLx / MLx series)

It involves a very cost-effective and flexible method of detecting the limit level of conductive liquids in tanks, containers and pipes. In addition to media recognition, this measuring principle can also be used for pump / dry-run protection. The probe can be designed as both, a single rod and a multi-rod probe. The probe rods can be retroactively shortened and/or bent in order to ensure an optimal adaptation to the measurement situation. The evaluation electronics can be installed in the probe head or externally in the switch cabinet.

Conductive control for fill level monitoring

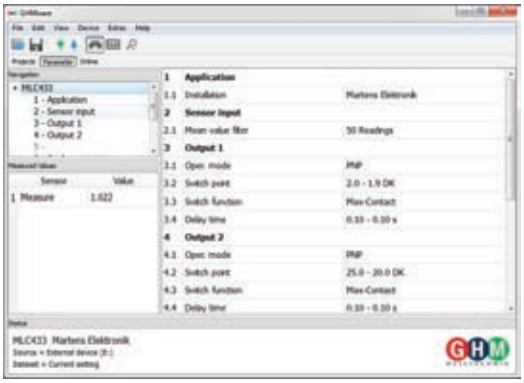


Benefits

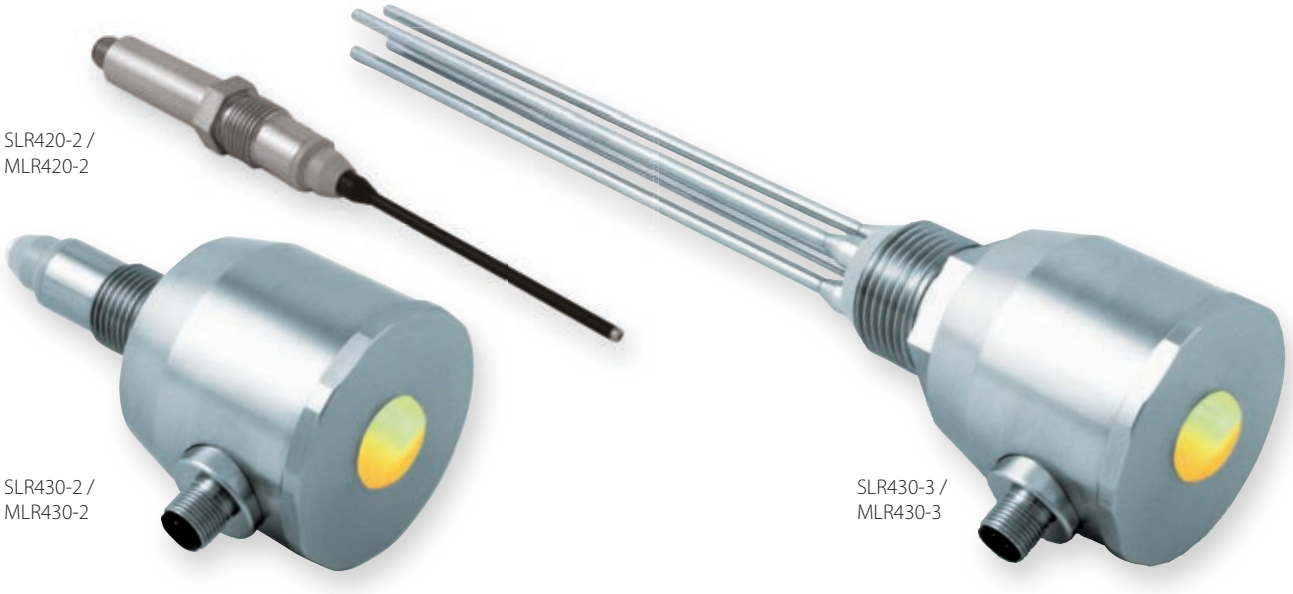
- Process connection M12, G ½", G 1" hygienic
- Electrode length: 5 . . . 5000 mm
- Up to 4 electrodes
- Electrodes optional with PFA coating for adhesions
- Level recognition and control of up to 3 limit levels with integrated evaluation electronics
- One sensor with simultaneous measurement of level and temperature (SLT or MLT series)
- With / without integrated evaluation electronics
- Configurable with GHW*ware* via mini USB interface and/or USB programming adapter
- Min. media conductance > 2 µS
- Intense LED status display

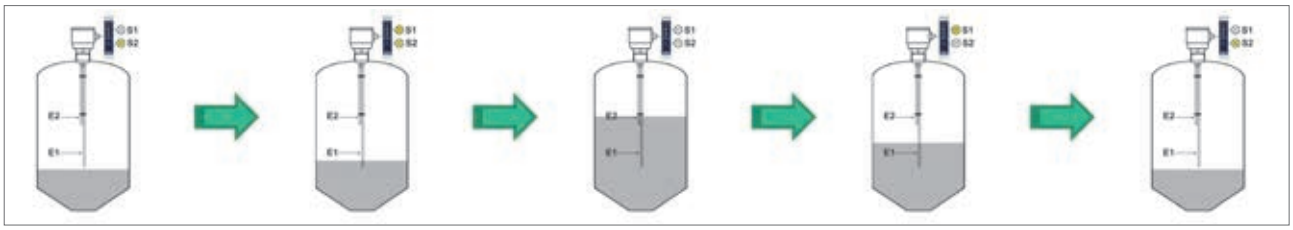
Can be used for:

Medium	[S/m]
Fruit juice	2 . . . 16
Cream	5*10 . . . 2* 10-2
Water	0.05
Salt water	5



GHM*ware*





Conductive measurement principle MLR

Special features

Additional function: **Fill level monitoring** between 2 limit levels. Function available in MLR120, MLR 157 and MLR 430.

- Output S2 switches when the fill level drops and the electrode E1 is no longer covered. Output S2 retains its status and/or only switches when the fill level increases and Electrode E2 is covered.
- Output S1 switches on when the medium covers E1 and the fill level is between E1 and E2 (not covered). Output S1 switches off when the fill level is outside this range.

External Evaluation electronics

- Up to 4 electrode inputs + Pt100 input (for sensors with integrated temperature sensor)
- Parameterisation by mean of rotary/DIP switch or touch screen and/or GHMware operating software
- 2 or 5 alarm outputs (relay changeover + transistor)
- Measurement range 0.05 kΩ . . . 500 kΩ
- Wide range power supply unit 18 . . . 230 V AC/DC
- Response times ≤ 50 ms . . . 10 s
- Housing widths of 22.5 or 50 mm, carrier rail mounting TS35 DIN EN 60715

MLR120

MLR157

CIP-/SIP-capable | Hygienic Design | FDA conform materials

Electromagnetic flow measurement (MFI)

With the electromagnetic flow measurement, a measurement voltage proportional to the flow speed is generated in a solenoid coil by a conductive liquid. This is tapped with the electrodes and converted in consideration of the pipe cross-section of the transducer in the actual volume flow. The measurement process is practically independent of pressure, density, temperature, and viscosity, and has no moving parts (not subject to wear) or pressure losses.

Application

- Measurement of conductive liquid, semi-pasty, or pasty media with a minimum conductivity ≥ 5 µS/cm.
- Hygienic and sterile applications
- Monitoring and control of processes, e.g. CIP circuits or filtration processes
- Measurement of pulsing liquids
- Simple dosing and filling tasks
- Dosing of aromas, dyes, vitamins, and enzymes

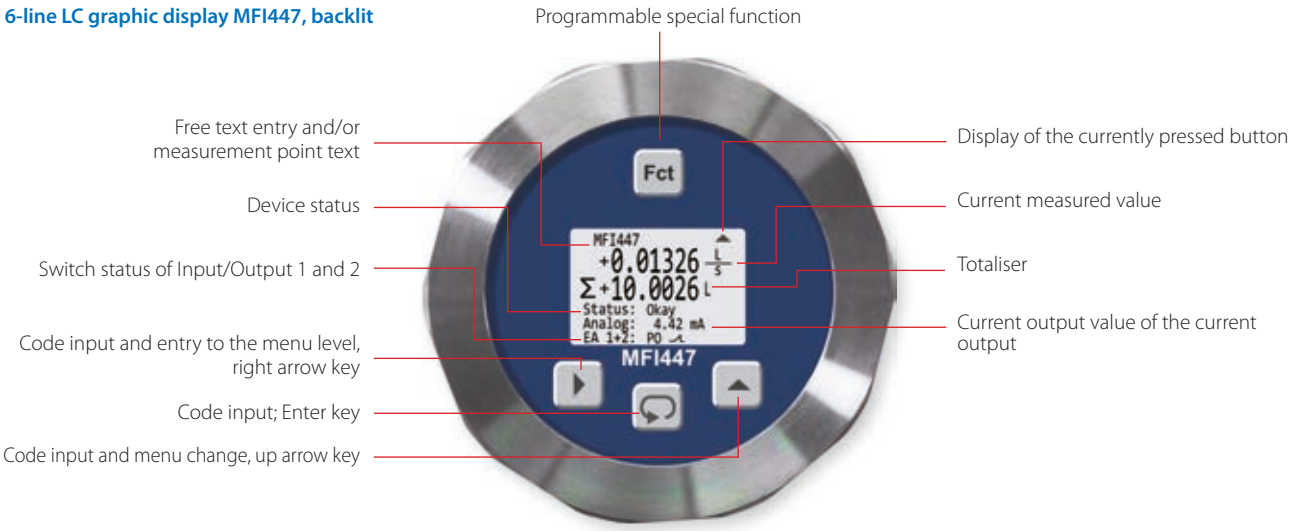
Benefits

- Ultra compact design (space-saving installation)
- Entirely stainless steel design
- Nominal diameter DN 1 . . . 100
- Vacuum-proof PFA lining
- Variable process connection concept
- Bi-directional flow rate measurement
- Pivotable transducer housing
- Integrated dosing control (optional)

MFI447 DN1 / DN2

Accessories: 24 V DC battery supply for MFI 447

6-line LC graphic display MFI447, backlit



CIP-/SIP-capable | Hygienic Design | FDA conform materials

Flow measurement of the smallest quantities (HFK35-FIN)

The electronic flow measurement takes place with the calorimetric measurement without moving mechanical parts in the flow (e.g. now turbine wheel or floating elements). Therefore, this sensor can also be used for media loaded with solid material. For the task of continuous measurement of, for instance, the smallest quantities (drops) aromas, spirits, water, etc. in the beverage industry, or of chemically aggressive media, the HFK35-FIN flow meter is used.

HFK35-FIN

Application

- Monitoring and measurement of very small flows, monitoring of leaks

Benefits of HFK35-FIN

- Various pipe sizes (6, 8, and 10 mm), suitable

Calorimetric flow measurement (HFK)

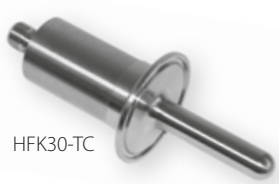

HFK12


HFK35

HFK30


APH502

May only be used for installation in the process line. Then the factory calibration situation corresponds to the actual installation situation.


HFK30-TC

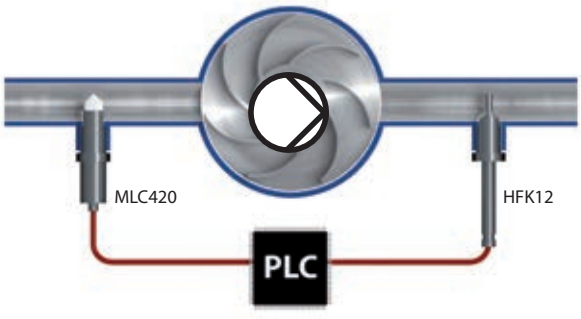
Application:

- Pump / dry-run protection
- Leakage checks of pipe systems and valves
- Medium recognition, e.g. of CIP returns

Benefits of HFK sensors

- Process connection: Tri-Clamp or G ½"
- Can be integrated with pipe diameter DN25 or higher
- Measurement range: Water: 0.2 . . . 3 m/s
- Quick reaction time of 1 . . . 2 s
- Switching, analogue, frequency, or pulse output (option: analogue temperature monitoring and flow monitoring via switching output)

Pump protection
(dry run protection with limit level and flow monitoring)

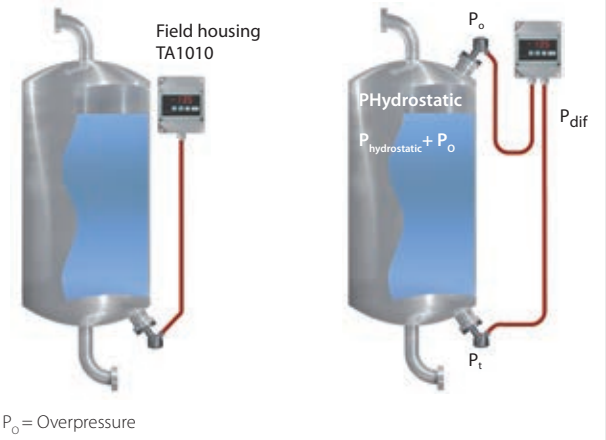


CIP-/SIP-capable | Hygienic Design | FDA conform materials

Hydrostatic level measurement (SA11, MLH 437/430, TA1010)

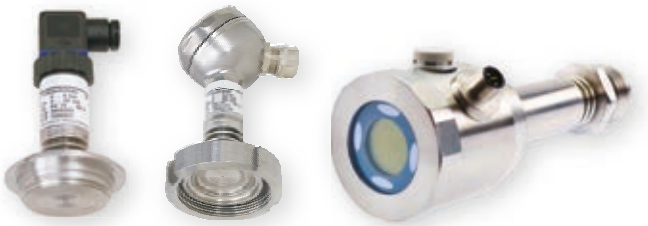
The fill level measurement is based on the measurement of hydrostatic pressure. The pressure is determined with the liquid column by means of the sensor and is directly proportional to the fill level. Using evaluation electronics adapted to the sensor, the results can then be visualised or processed further.

Differential pressure and tank linearisation



P_o = Overpressure

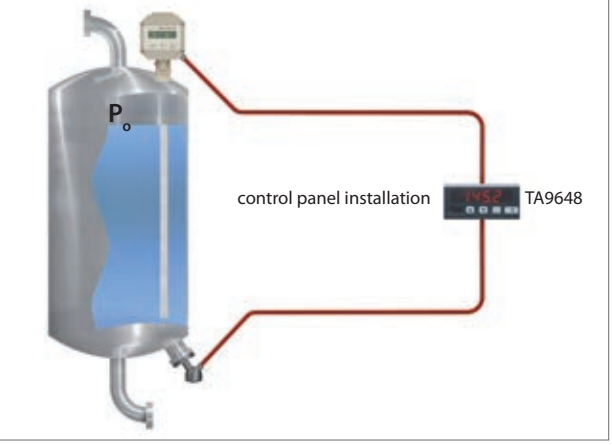
- Content measurement for arbitrary tank shapes by means of pressure measurement
- High measurement precision ≤ 0.5 %
- Differential pressure measurement with double pressure measurement and evaluation device
- Entirely stainless steel design
- Protection rating IP65 or IP69K
- Suitable for tank linearisation by means of TA1010 or TA9648 evaluation electronics (6 tank geometries as well as arbitrary special tank shapes can be selected)
- Flexible adaptation to all common process connection types



SA11-0 SA11-1 MLH

Capacitive fill level measurement (UNICON-CL)

Differential pressure and tank linearisation



- Measuring ranges 0 - 200 mm to 0 – 3000 mm
- Programmable units (mm, cm, in, ft, yd, m)
- PTFE measuring rod with G ¾ connection thread
- Compact design in 2-conductor technology
- Outputs: 2 x 4–20 mA (for fill level and temperature), galvanically isolated, 2 x transistor switching output
- Protection rating IP65
- Precision 0.5 % ±2 mm
- Continuous temperatures of up to 120 °C (steam sterilisation compatible)

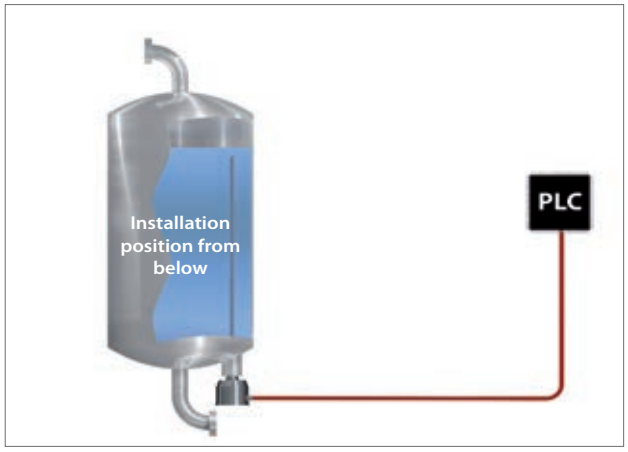
Applications:

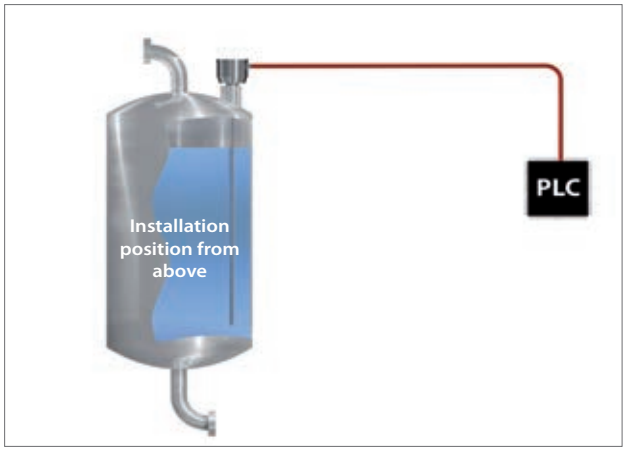
- Liquid, conductive, adhering media

CIP-/SIP-capable | Hygienic Design | FDA conform materials

Potentiometric level measurement (MLP)

With the MLP series, the level of all liquids is continuously measured with a minimum conductivity ≥ 20 µS/cm.
With the use of electrical influence, the reference pole could be routed to the probe in a manner such that an electrical connection at the tank is no longer necessary. This opens up new application possibilities such as measurements in glass and plastic containers.





MLP433
1 measuring stick
(Used for metall tanks)

MLP437
with LC-Display
2 measuring stick
(Used for plastic tanks)

Application:

- Metal and plastic tanks
- Liquid and pasty, strongly adhering, electrically conductive media
- Continuous measurement suitable for fill level regulation, particularly in small containers (supply and preparation containers)
- Pressurised tanks

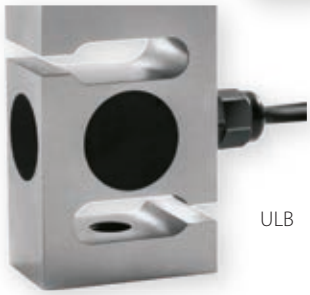
Benefits

- Dynamic measurement low fill levels from 10 cm up to 2.5 m.
- Minimum conductivity ≥ 20 µS/cm
- High measurement precision less than ± 1.0 mm
- Single rod version - also for non-metallic containers
- Independent of pressure, temperature and density
- Suitable for high continuous ambient temperatures of up to 130 °C
- 2 freely configurable switching outputs, 0/4 - 20 mA output freely scalable with loop function
- Various process connections
- Rod length to millimetre precision available
- Parameterisation by means of GHM*ware* via USB interface

Weighing technology (DMS50 + . . .)

- Transducer without contact with the medium
- DMS measuring bridges / Ex approval
- Measuring range from 0 . . . 2 kg to 0 . . . 5000 kg to max. 0 . . . 100 t
- Basic precision of 0.02 % to 0.1 %
- Reproducibility ≤ 0.03 %
- Max. overload 150 % to 200 %
- Protection rating IP40 to IP67

PC22



ULB

RC3

Evaluation electronics(DMS50)

- 1 or 2 operating directions
- Teach-in function
- Tare function
- Simulator function
- Variable units (kg, t, N, kN, Nm, bar)
- Min/Max value buffer
- LED and/or LCD display
- Basic precision < 0.1 % to 0.025 %
- Modbus / Profibus DP connection
- Up to 4 alarm outputs

DMS50

Applications

- Determination of contents of complete containers
- Control of batch processes

Turbidity measurement

The MAT433/437 turbidity meter is designed for phase seperation in the food and beverage industry. The transmitted light method (0°) according to EN ISO 27027 additionally permits the measuring of large opacities and therefore allows a far larger range of measurement of diffused light at 11° or 90°. The turbidity is output as a percentage of the maximum measurement value. This value can be converted with an integrated conversion table into material-specific concentrations or into the formazine-based unit FAU.

MAT 433

MAT 437

Applications

- Product differentiation / phase separation
- Filter and separator monitoring
- Yeast management in breweries

Benefits

- Measuring according to DIN EN 27027, measuring angle 0° (absorption), wavelength 860 nm
- Foreign light compensation and self-monitoring
- Installation in standard Varinline housing with dead-space free design
- Calibration and display in % (absorption), FAU (Formazine Absorption Units), customer specific concentration units (e.g., ppm)
- 2 Switch outputs and analogue output 0/4 ... 20 mA
- Measuring according to DIN EN 27027, measuring angle 0° (absorption), wavelength 860 nm
- CIP cleanable (cleaning in place)
- Protection class: IP67 / IP69K

CIP-/SIP-capable

FDA conform materials

Conductive conductivity (UNICON-LF)

Measurement with conductive 2 and 4-pin sensors is the most widespread approach. The variety of process connection types enables the measurement in nearly any application. All areas from water to aggressive acids are covered.

Areas of application/special features

- 2 and 4-electrode measuring cells available
- Measuring ranges from 0.5 µS/cm – 500 mS/cm
- Measurement precision < 0.5 % per unit
- Compatible with all common media, including purified water
- Temperature compensation (Pt100 or Pt1000)
- Outputs: 2 x 4 – 20 mA for LF and temperature, galvanically isolated
- Various designs (application-dependent):
  - Food version Can be steam sterilised for 1 h at up to 140 °C, for concentration of cleansing media, phase isolation in CIP circuits
  - High-temperature version available for up to 200 °C
  - Compact immersion measuring cells for basins and wells with pressure of up to 10 bar
  - Immersion measuring cells for channels, basins, and open systems

Conductivity measuring cells

LF2653HT

LF1453/LF2453

LF1553/LF2553

LF1653/LF2653

LF3433/LF4433

LF3533/LF4533

LF3733/LF4733

Conductivity indicators

LF1010

LF9648

UNICON-LF

CIP-/SIP-capable | Hygienic Design | FDA conform materials

pH / Redox measurement (UNICON-pH)

One of the most important measurements in process measurement technology is made incredibly easy with our converters and indicators. Tasks such as connecting, configuring, and even calibrating have been made intuitive with our devices.

- Field or top mounted
- Measurement with single rod measurement chains
- Measuring range for pH -1 – +15 / Redox ±1500 mV
- Temperature compensation (Pt100 or Pt1000)
- Measurement precision ≤ 0.2 %
- Output 4 – 20 mA for pH and temperature
- 2 alarm outputs, transistor

pH and Redox converter
UNICON-pH

pH and Redox measuring device
pH9648

Fitting
EA1730/EA2730

Fitting
EA1730/2730

Flow vessel DFG

Changeover device WA120

LAB Standard

Handheld measuring units

The housing concept of GHMsilver was carefully tailored together with product designers to current and future applications.
The shape is ergonomically optimised. Gripping and viewing fields are clearly recognisable. Haptics, interface, and product graphics support intuitive use. Maximum variability for measurement of the widest range of physical factors is achieved with very few components.
The base housing can be appropriately equipped depending on the equipment variant and measurement - in the process, cost efficiency or comfort, etc. can be prioritised.

Applications

Measurement of
- Pressure
- Temperature
- Conductivity
- pH/Redox

Benefits

- Durable and waterproof housing
- Waterproof plug connector and/or sensor
- Compact dimensions
- Durable silicone protective sleeve
- Simple to use
- Enormous battery service life
- High functional range:
  Min/max. value buffer, auto hold, data logger*, analogue output*, serial interface*, etc.

GHMsilverline

The GHMsilverline comprises the following components, which are also available as a set:

Special features

- Waterproof handheld measuring unit
- High-quality case
- USB stick with operating software*
- USB adapter and cable, incl. analogue output connection*
- Accessories, such as waterproof pH electrode and buffer solutions or waterproof temperature sensor (varying according to measurement)

Included in the sets

- Factory calibration on delivery
- Factory calibration after 1 year with automatic memory from the calibration lab

Measured variables

- pH / Redox (SL-pH)
- Temperature (SL-Pt eco)
- Pressure (SL-P)
- conductivity

In preparation:

- O_2 dissolved oxygen
- Aerial oxygen