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SENSORS FOR FOOD AND BIOPHARMA.



HYGIENIC BY DESIGN

**ANDERSON-NEGELE**



PRODUCT OVERVIEW

ENGLISH 

FOOD

BIOPHARMA

CONTROLS

HYGIENIC BY DESIGN



**Gillain & Co**

HYGIENIC EQUIPMENT FOR FOOD & LIFE SCIENCES



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**ANDERSON-NEGELE.COM**

## SENSORS FOR FOOD AND BIOPHARMA.

HYGIENIC BY DESIGN

### WELCOME TO ANDERSON-NEGELE

Anderson-Negele is a global company specializing in the development and production of sensors and measuring equipment for hygienic applications. As your reliable and flexible partner, we aim to always provide you with the best solution for your process.

The name Negele has been synonymous with innovative products of high quality for over 40 years. As a pioneer in hygienic measurement equipment, we have focused on the specific needs of the food, beverage and pharmaceutical industry from the very beginning. Through our innovations, we strive to give our customers the economic and technological edge that will contribute to their success. To achieve this, we look at your particular needs and develop solutions that specifically address the demands for your production processes.

As part of the FORTIVE Corporation – a global “Fortune 500” technology leader – we practice the successful Fortive Business System (FBS). With the help of FBS, we ensure the high quality of our products in development and production and continuously improve our processes and methods.





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Sensor based on modular platform



IO-Link integrated as a standard



Remote version available

## FOOD. SENSORS FOR THE FOOD AND BEVERAGE INDUSTRY.



### You can count on it

LEARN MORE:



Our company philosophy, "HYGIENIC BY DESIGN", is directed at fulfilling your requirements for sensors and measuring equipment that operate in a hygienic, clean production environment.

**Process reliability in each application:** Our sensors have been developed for smooth processes in your production lines and for a reliable application even in most demanding environments. The special front flush design eliminates dead legs and ensures a hygienic CIP / SIP cleanability at any moment.

**Durability through robust design and technology:** Our sensors are designed to resist heavy mechanical stress as well as most difficult environments by featuring e. g. a CIP / SIP persistence of up to 150 °C or a protection class up to IP 69K.

**Hygienic by design through stainless steel:** All components that come into contact with the medium are made of stainless steel 1.4404 or 1.4435. The roughness value can be reduced down to  $\leq 0.4 \mu\text{m}$ , the surfaces can be electropolished on request.

**Tested and approved:** The guidelines of the North American 3-A (3-A Sanitary Standards Inc.) and the EHEDG (European Hygienic Engineering & Design Group) are the measure according to which we develop all of our products.

Naturally, our sensors meet FDA (Food and Drug Administration requirements and fulfill the applicable EC directives.



HYGIENIC BY DESIGN

ANDERSON-NEGELE



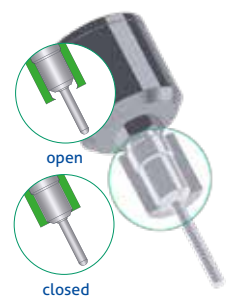
### A special design

What "HYGIENIC BY DESIGN" specifically means can be found in the two systems that Anderson-Negele developed for the process adaptation of its sensors in your line: CLEANadapt and FLEXadapt.

**CLEANadapt – the process connection without dead legs:** Sealing edges at the weld-in sleeves and conical sealing surfaces enable integration of our sensors in processes in a manner that is devoid of dead legs and free of elastomers. With CLEANadapt, the sensors can be hygienically installed in existing lines. Additional O-rings or sealants are not required with CLEANadapt.

**FLEXadapt – sensor exchange during ongoing processes:** In unfavorable cases, the exchange of a sensor can result in the standstill of an entire line. FLEXadapt permits the installation and removal of temperature sensors – at any time and without opening the process – for verification and recalibration. The FLEXadapt technology with weld-in thermowells minimizes downtimes and ensures the hygienic installation of the sensors.

In addition to prefabricated build-in systems, various adapters are available for welding in and retrofitting, along with the compatible temperature sensors. The risk of introducing traces of old products, foreign bodies and germs via the sensor is effectively eliminated when FLEXadapt is used.





# FOOD



## TEMPERATURE

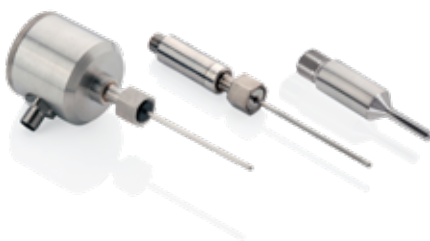
### Temperature measurement without opening the process



#### Temperature sensor with hygienic FLEXadapt build-in system

- » Flexible thermowell system – removal of the sensor without opening the process
- » For pipes from DN 25 and vessels
- » Easy, fast installation and calibration

#### TFP FLEXadapt



### Temperature measurement in pipes and vessels



#### Temperature sensor with hygienic CLEANadapt build-in system

- » Modular adaptation concept for all standard process connections
- » Elastomer-free, hygienic installation without dead legs
- » Front flush design possible
- » For pipes from DN 15 and vessels

#### TFP CLEANadapt



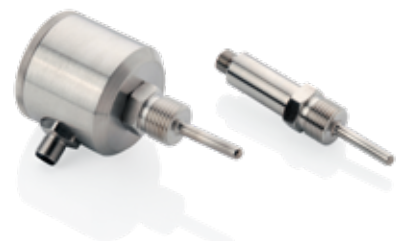
### Temperature measurement in pipes and vessels



#### Temperature sensor with standard thread

- » Universal G1/2" standard thread
- » No product contact with the sensor when using weld-in sleeves
- » Optionally available with spring-loaded sensor tip (TFP-40G)

#### TFP Standard





### Temperature measurement in pipes and vessels



#### Temperature sensor with Tri-Clamp connection

- » Standard Tri-Clamp connection sizes
- » Rapid response time
- » Direct connection without adapter

#### TFP Tri-Clamp



### Temperature measurement in pipes and vessels



#### Temperature sensor without thread

- » Variable submersion depth of sensor with hygienic threaded clamp
- » No product contact of sensor with use of thermowells

#### TFP without thread



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T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

### Digital in-situ temperature display



#### Temperature sensor with digital display

- » Large digital display, optionally with switch output
- » Battery-operated or with external power supply
- » Model for temperature monitoring in autoclaves ("retort" DTG)

#### FH-DTG



# FOOD



## LEVEL

### Continuous level measurement



#### Continuous level sensor in modular design

- » Ideal for applications with foam
- » Insensitive to adherence
- » No adaptation to alternating media required
- » Measurement unaffected by temperature and pressure
- » For vessels from 50 mm to 3 m

#### NSL-F, NSL-FR, NSL-M



### Hydrostatic level measurement



#### Level sensor for pressurized tanks / differential pressure sensor

- » Parallel output of differential and head pressure
- » Integrated tank linearization and density compensation
- » Digital communication without capillaries
- » Components' replacement on site possible

#### D3



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### Hydrostatic level measurement



#### Climate-independent level sensor with hygienic CLEANadapt build-in system

- » Hermetically sealed measuring system – no drift problems due to condensation
- » Very high accuracy and long-term stability
- » Measurement to 130 °C medium temperature
- » 3-year warranty

#### LAR





## POINT LEVEL



### Point level detection and control



#### Conductive point level switch for pipes and vessels

- » Single rod sensor with integrated electronics
- » Multi-rod sensor for up to 4 levels
- » Rods can be bent and shortened
- » For conductive media

#### NVS



### Point level detection in pipes and vessels



#### Capacitive point level switch for pipes and single or double walled vessels

- » Reliable switching also with adhesive media
- » Insensitive to foam
- » Small build-in length and very good cleanability
- » Measurement unaffected by the conductivity of the medium

#### NCS



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T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

### Point level detection in vessels and overfill protection



#### Capacitive point level switch for single or double walled vessels

- » Reliable switching even with strongly adhesive media
- » Installation in vessels from below or from above
- » Rapid response time
- » Optionally heated electronics to avoid condensation

#### NCS-L



# FOOD



## PRESSURE

### Modular pressure platform



#### Modular pressure and level sensor

- » High precision pressure and hydrostatic level measurement
- » Accurate display of pressure, mass or volume even with rapid temperature variations
- » Integrated tank linearization and density compensation

L3



### Process pressure measurement in pipes and vessels



#### Compact pressure sensor

- » Robust and durable – even at process temperatures up to 150 °C
- » Housing completely resistant against cleaning chemicals
- » Rapid response time
- » Available as relative or absolute pressure transmitter

DAN-HH



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### Digital in-situ pressure display



#### Digital pressure gauge

- » Large, digital display, optionally with switch output
- » Battery-operated or with external power supply
- » Automatic registration of min and max values

MAN-90-BAT





## Pressure monitoring in vessels



### Pressure gauge with direct adaptation 90 mm

- » For superior mechanical stress and extended process requirements
- » Extremely robust design
- » High quality stainless steel design
- » 3-A certification

EL



## Pressure monitoring in separators



### Compact pressure gauge with hygienic process adaptation CLEANadapt 63 mm

- » For superior mechanical stress and most demanding process conditions
- » Extremely robust design
- » High quality stainless steel design
- » 3-A certification

MAN-63



More information?  
 T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

## Pressure monitoring in homogenizers



### Pressure gauge with integrated transmitter for homogenizers

- » For extreme process conditions and pressures up to 1000 bar
- » Very high reliability and durability
- » Optional analog output

ELH



# FOOD



## FLOW

### Flow monitoring and dry-run protection



### Flow measurement of demineralized water



#### Ultrasonic flow switch

- » Reliable measurement even with high temperatures of up to 140 °C
- » Measurement unaffected by temperature variations
- » Very rapid response time
- » For media with turbidity  $\geq 1$  NTU

#### FWS, FWA



#### Calorimetric flow switch

- » Fully compensated measurement up to 100 °C
- » Integrated safety switch-off at a medium temperature of  $t > 100$  °C
- » Also suitable for highly pure media
- » Integrated electronics with on-site display

#### FTS



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#### Turbine flowmeter

- » Measurement independent of the conductivity of the media
- » Cost-effective and reliable alternative to mass flow meters
- » Extended lifetime due to easy rotor exchange
- » 3-A certification

#### HM-E







## Flow measurement



### Magnetic-inductive flowmeter

- » Superior measurement accuracy even in case of low flow rate
- » Long life span due to moisture proof and corrosion resistant design
- » Vacuum tight PFA coating for maximum resistance against aggressive media
- » Very high measurement accuracy and reproducibility:  $\pm 0,2 \% \pm 1 \text{ mm/s}$

FMI, FMI-R



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 T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

## Flow measurement



### Compact magnetic-inductive flowmeter

- » Minimum effort for maintenance
- » Compact electronic device with stainless steel housing
- » High measurement accuracy and reproducibility:  $\pm 0,5 \% \pm 2 \text{ mm/s}$

FMQ, FMQ-R



# FOOD



## CONDUCTIVITY / REFRACTOMETER

Control of CIP processes, concentration measurement, product monitoring and quality assurance



Inline measurement of concentration of liquids



### Inductive conductivity sensor in modular design

- » Modular Design for flexible configuration
- » Individual configuration from a cost-efficient basic model up to the high end version
- » Freely selectable outputs: Conductivity, temperature and also concentration
- » Selectable measurement range: 1...1000 mS/cm
- » Extremely short response time of 1.2 s for highest efficiency
- » Fully compensated measurement up to a temperature of 130 °C
- » Calibration function: Offset and span can be adjusted by the customer
- » Housing in stainless steel, submersible body made of PEEK for tubes from DN 40

### Compact, front-flush refractometer

- » Output in °Brix, °Plato, refractive index nD or customer specific
- » Easy inline integration without bypass
- » Fully automatic and continuous measurement, for maximum product consistency and minimum labour cost

### ILM-4, ILM-4R



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 T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

### IRM-11





## Phase separation, filter and separator monitoring



### Turbidity sensor (backscatter light) in modular design

- » Front-flush mounted, hygienic sensor
- » Reduction of water consumption
- » Cost reduction in CIP processes
- » Active phase separation in the production process: precise switching between product, mixed phase and water
- » Automation of the yeast harvest in breweries
- » High reproducibility and rapid response time
- » Glass-free sapphire optics
- » Front flush sensor: simplified pipe cleaning (pigging possible), ideal for media with adhesive fibers or particles

### ITM-51, ITM-51R



More information?  
T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

## Phase separation, filter and separator monitoring



### Turbidity sensor (4-beam alternating light)

- » Filter monitoring
- » Control and automation of separators
- » Supervision of the water quality
- » Lauter tun control
- » Eventual pollution of the optics is compensated

### ITM-4



## PHARMA. SENSORS FOR THE PHARMACEUTICAL INDUSTRY AND BIOTECHNOLOGY.



### LEARN MORE:



### Warrants for trouble-free processes

For many years, our customers in the pharmaceutical industry and in biotechnology have trusted in sensors and measurement systems from Anderson-Negele.

**Durable and reliable:** The processes in highly sensitive production lines eliminate the risk of introducing foreign substances from the outset. Maintenance and repair measures must have little or no impact on the process. This is particularly true of sensors and measurement equipment integrated in the line – and relates to features such as the sensor material, surface quality, dead-leg-free design and pharmaceutical process adaptation.

**Aseptic by design – at any moment:** The quality requirements specific to the pharmaceutical industry are grouped under the term "aseptic design", which is a concept that extends beyond international sanitary regulations.

- » Installation in all common pipe standards (DIN, ISO, ASME)
- » All process-contacting parts made of stainless steel 1.4435 or 316L
- » Acceptance certificate 3.1 as per EN 10204
- » Electropolished surface with  $R_a \leq 0.8 \mu\text{m}$  and  $0.4 \mu\text{m}$
- » Surface inspection certificate
- » Delta-ferrite measurement report
- » Pressure certificate as per AD 2000
- » Elastomers and plastics with USP Class VI approval





HYGIENIC BY DESIGN

ANDERSON-NEGELE



### Pharma production. ASEPTIC BY DESIGN

Your production must operate with a high degree of efficiency – regardless of whether as an entire line or as an individual component. Anderson-Negele has developed three technologies that will let your lines run continuously during daily operations:

**PHARMadapt EPA – Sensors for reduced spaces:** The process adaptation system PHARMadapt integrates temperature and point level sensors even in pipes with very small nominal widths. The seal with exchangeable O-rings meets the technical requirements stipulated for lines in the pharmaceutical industry.

**PHARMadapt ESP – Sensors without medium contact:** If the temperature sensors are not permitted to come into direct contact with the medium and the process should not be opened, the PHARMadapt ESP system developed by Anderson-Negele is the optimal solution for your line. Because no two lines are alike, adapters and compatible temperature sensors are available in addition to the complete build-in systems.

**CPM - Sensors for front-flush integration:** The CPM technology was developed specifically for the pharmaceutical process adaptation of pressure sensors and gauges for the purpose of taking measurements in pipes with small diameters. CPM technology enables a front-flush mounted, absolutely dead-leg-free measurement location.



# PHARMA



## TEMPERATURE

### Temperature measurement in aseptic lines



#### Temperature sensor with aseptic PHARMadapt ESP build-in system

- » Aseptic thermowell system – removal of the sensor without opening the process
- » Rapid response time, very compact measuring point
- » Insensitive to vibrations
- » Electropolished temperature sensor,  $R_a \leq 0.8 \mu\text{m}$   
 $R_a \leq 0.4 \mu\text{m}$  optional

#### TFP PHARMadapt ESP



### Temperature measurement in very small pipe diameters



#### Temperature sensor with aseptic PHARMadapt EPA build-in system

- » Dead-leg-free, pharmaceutical measurement location with O-ring
- » For pipe diameters from DN 10
- » Rapid response time, very compact measurement location

#### TFP PHARMadapt EPA



More information?  
 T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

### Temperature measurement in pipes and vessels



#### Temperature sensor with hygienic CLEANadapt build-in system

- » Elastomer-free sealing concept
- » Gap-free and dead-leg-free M12 connection for pipe diameters from DN 15
- » Rapid response time
- » Electropolished temperature sensor,  $R_a \leq 0.8 \mu\text{m}$   
 $R_a \leq 0.4 \mu\text{m}$  optional

#### TFP CLEANadapt



## TEMPERATURE



### Temperature measurement in bioreactors



#### Temperature sensor with fermenter connector

- » Standard process connection for building into vessels
- » Easy-to-sterilize measuring point
- » Connector length: 46 mm or 52 mm

#### TFP Fermenter



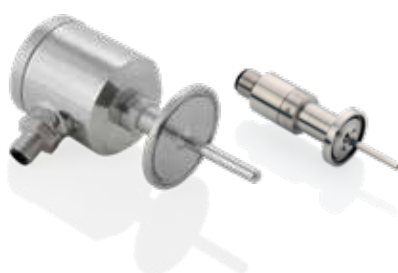
### Temperature measurement in pipes and vessels



#### Temperature sensor with Tri-Clamp connection

- » Universal Tri-Clamp
- » Rapid response time
- » Electropolished temperature sensor,  $R_a \leq 0.8 \mu\text{m}$   
 $R_a \leq 0.4 \mu\text{m}$  optional

#### TFP Tri-Clamp



More information?  
 T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

### Digital in-situ temperature display



#### Temperature sensor with digital display

- » Large digital display, optionally with switch output
- » Battery-operated or with external power supply
- » Process connections for pharmaceutical applications

#### FJ



# PHARMA



## POINT LEVEL

### Point level detection in very small pipe diameters



#### Capacitive point level indicator with Pharmadapt EPA

- » Reliable switching also with adhesive media
- » Insensitive to foam
- » Measurement unaffected by the conductivity of the medium
- » For pipes from DN 10

#### NCS EPA



### Point level detection in pipes and vessels



#### Capacitive point level indicator with direct connection

- » Reliable switching even with adhesive media
- » Insensitive to foam
- » Measurement unaffected by the conductivity of the medium

#### NCS-31P Direct Connection



More information?  
T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

### Point level detection in pipes and vessels



#### Capacitive point level sensor for vessels

- » Reliable switching even with strongly adhesive media
- » Installation in vessels from below or above
- » Rapid response time
- » Optionally heated electronics to avoid condensation

#### NCS-L Pharma





## LEVEL / PRESSURE



### Hydrostatic level measurement



### Hydrostatic level measurement



### Pressure measurement in pipes and vessels



#### Level switch for mounting from above

- » Hermetically sealed measuring system
- » Very high accuracy and long-term stability
- » Mounting from above for easy installation

LA



#### Climate-independent level sensor

- » Hermetically sealed measuring system
- » Very high accuracy and long-term stability
- » Measurement up to 130 °C medium temperature

SX



More information?  
 T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

#### Modular pressure sensor

- » For use at process temperatures up to 177 °C
- » Integrated display
- » No tools required for calibration and adjustment
- » Electropolished surface,  $R_a \leq 0.2 \mu m$

MPP



# PHARMA



## PRESSURE

### Digital in-situ pressure display



#### Digital pressure gauge

- » Large digital display (battery-operated)
- » Automatic registration of min and max values
- » Optionally available with switch output and external power supply
- » Electropolished surface,  $R_a \leq 0.2 \mu\text{m}$

#### MAN-90P-BAT



### Pressure monitoring in small pipe diameters



#### Compact pressure gauge 63 mm

- » Extremely robust design for highest requirements
- » Autoclavable
- » Tri-Clamp 3/4", 1" and CPM
- » Electropolished surface,  $R_a \leq 0.2 \mu\text{m}$

#### EK



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 T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

### Pressure monitoring in pipes and vessels



#### Pressure gauge 90 mm

- » Extremely robust design for highest requirements
- » Autoclavable
- » Adjustment of zero and span
- » Electropolished surface,  $R_a \leq 0.2 \mu\text{m}$

#### EM





### Dead-leg-free pressure measurement in small pipe diameters



#### Compact pressure sensor with aseptic build-in system

- » Dead-leg free, aseptic process connection with Tri-Clamp or front-flush CPM
- » Nominal pipe widths 1/4" to 4" (ASME)
- » High process temperature up to 150 °C
- » Electropolished surface,  $R_a \leq 0.2 \mu\text{m}$
- » Intrinsically safe (UL Class 1)

#### HA Mini



### Pressure measurement in pipes and vessels



#### Autoclaveable compact pressure sensor

- » Fully autoclaveable (124 °C, 1 h)
- » Up to 30 autoclave cycles without recalibration
- » High process temperature up to 150 °C
- » Electropolished surface,  $R_a \leq 0.2 \mu\text{m}$
- » Intrinsically safe (UL Class 1)

#### HA Autoclaveable



More information?  
T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

### Pressure measurement with diaphragm monitoring



#### Pressure gauges and sensors with Sentinel DFI (Diaphragm Failure Indication)

- » Immediate alarm signal in case of a diaphragm failure
- » The sensor can be exchanged immediately, no risk of further contamination of products
- » Double diaphragm for improved protection against contamination combined with high accuracy

#### MPP-DFI / EM-DFI





# PHARMA



## FLOW

### Flow measurement in flash pasteurizer



#### Magnetic-inductive flowmeter

- » Also for low flow rate
- » Long life span due to moisture proof and corrosion resistant design
- » Vacuum tight, rigid tube lining to resist high temperatures
- » Very high measurement accuracy and reproducibility:  
 $\pm 0,2 \% \pm 1 \text{ mm/s}$

FMI, FMI-R



#### Compact magnetic-inductive flowmeter

- » Minimum effort for maintenance
- » Compact electronic device with stainless steel housing
- » Pharmaceutical version with all necessary certificates
- » High measurement accuracy and reproducibility:  $\pm 0,5 \% \pm 2 \text{ mm/s}$

FMQ, FMQ-R



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### Flow measurement of demineralized water



#### Turbine flowmeter

- » Measurement unaffected by the conductivity of the medium
- » Cost-effective and reliable alternative to mass flow meters
- » Extended lifetime due to easy rotor exchange
- » Hygienic design for pharmaceutical applications

HMP





## FLOW / CONDUCTIVITY / TURBIDITY



### Flow monitoring/ dry-run protection



#### Calorimetric flow switch

- » Fully compensated measurement up to 100 °C
- » Integrated safety switch-off at a medium temperature of  $t > 100$  °C
- » Also suitable for highly pure media
- » Integrated electronics with on-site display

#### FTS



### CIP process control



#### Inductive conductivity meter

- » Modular design for flexible configuration
- » Individual configuration from a cost-efficient basic model up to the high end version
- » Freely selectable outputs: Conductivity, temperature and also concentration

#### ILM-4, ILM-4R



More information?  
 T: 03 870 60 80 / E: [advice@gillain.com](mailto:advice@gillain.com)

### Quality control of products



#### Turbidity sensors

- » ITM-51, ITM-51R: Front-flush, back-scatter sensor for medium and high turbidities; active phase separation in the production process
- » ITM-4: Accurate 4-beam measurement at low and medium turbidities
- » Color-independent measurement (wave length 860 nm)

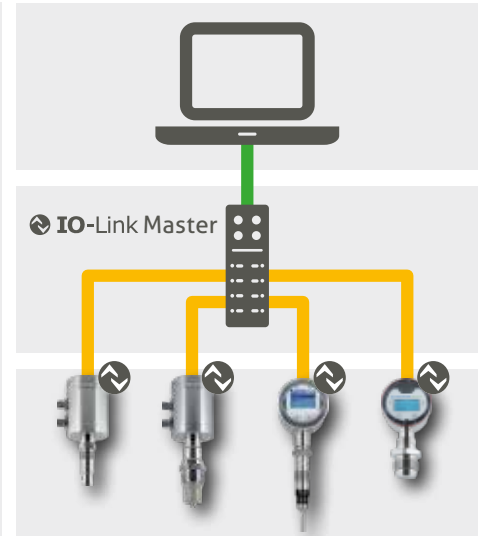
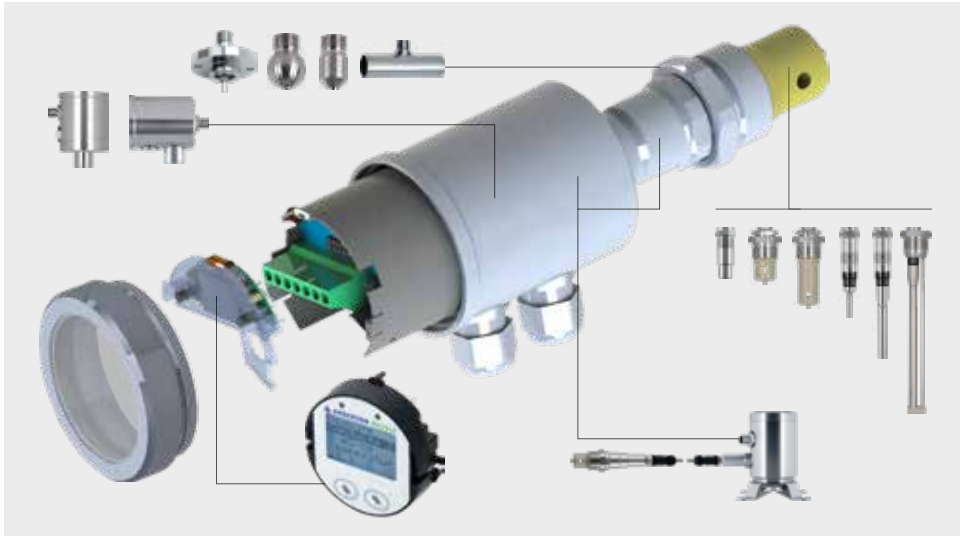
#### ITM Series



# MODULAR PLATFORM



## MODULAR SENSOR PLATFORM WITH IO-LINK



### Flexibility with universal interface



The sensors ITM-51 for turbidity, ILM-4 for conductivity, NSL-F for level and D3 for pressure are based on our innovative, modular Anderson-Negele system platform.

This landmark concept with universally interchangeable components offers, as an addition to the analog data transfer, the digital IO-Link interface.

This sophisticated platform unifies all existing, proved and tested functions with the benefits of the digital technology. The IO-Link module is standard for all new products and for existing sensors. An upgrade is easily possible by module exchange.

IO-Link allows for a faster, more precise and more substantial data transfer than other interfaces. The operation set-up is easy and needs only reduced time and effort due to the simplified standard IO cable connection and parametrization

## CONTROLLERS, POINT LEVEL DEVICES, SWITCH CONVERTERS



### Instrumentation and controls

Special applications require specialized process control technology, because precise measurement results always influence the current production process. We apply our expertise from the field of sensors also for the development of appropriate process control equipment. Consequently, our product range also comprises a complementary assortment of controllers and displays.

For the evaluation of measurement values in a wide variety of line controllers and control centers, we provide suitable measurement amplifiers, signal transmitters, digital indicators and alarm relays, as well as a modular I/O system for the integration of all Anderson-Negele sensors in a field bus. All simulators, calibrators and setpoint transmitters have been designed for rapid and precise installation, simulation and calibration of sensors in your production line.



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SENSORS FOR FOOD AND BIOPHARMA.



HYGIENIC BY DESIGN

**ANDERSON-NEGELE**



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HYGIENIC BY DESIGN

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