SENSORS FOR FOOD AND BIOPHARMA.

HYGIENIC BY DESIGN

ANDERSON-NEGELE

PRODUCT OVERVIEW

ENGLISH

- FOOD
- BIOPHARMA
- CONTROLS

HYGIENIC BY DESIGN

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.



HYGIENIC BY DESIGN

ANDERSON-NEGELE

CONTENTS

Sensor based on modular platform

IO-Link integrated as a standard

Remote version available

ATEX approved

LEARN MORE:

You can count on it

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.

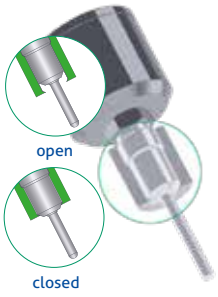
Hygienic by design through stainless steel: All components that come into contact with the medium are made of stainless steel 1.4404 or 1.4435. The roughness value can be reduced down to ≤ 0.4 µm, the surfaces can be electropolished on request.

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.

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 control in pipes and vessels

Temperature measurement without media contact

Modular, configurable Temperature sensor for all applications

- Modular adaptation concept for all-standard process connections
- Elastomer-free, hygienic installation without dead legs
- Front flush design possible
- For pipes from DN15 and vessels
- Individual configuration through 2 head sizes and optional display
- Process connection CLEANadapt available with stainless steel or PEEK

TSBF, TSMF (Mini)

Temperature sensor with built-in system FLEXadapt ESF

- Sensor installation in thermo-well permanently welded into the process
- Sensor removal for recalibration or replacement possible without opening the process
- Installation systems with screw-in sleeves, weld-in sleeves, T-pieces DN8...DN100 and adapters for clamping systems

TS FLEXadapt ESF

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

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

LEVEL / PRESSURE

Continuous level measurement

Hydrostatic level measurement

Hydrostatic 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

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

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

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 300 °C
- Relative, Absolute or Compound pressure measurement
- Fast, accurate and economic solution for standard applications
- Available with IO-Link or 4...20 mA data transmission

P41 / P42 (IO-LINK)

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

FOOD

PRESSURE

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

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

Content control for process vessels and tanks

Weighing Modules
Load Disc

- Highly accurate dynamic content measurement based on the tank weight
- For all process, stirring and mixing tanks or horizontal tanks
- Solid, firmly bolted mounting between tank leg and foundation
- Nominal loads 100 to 11,500 kg
- Measuring accuracy up to 0.03 %

LD360s, LD3, LD3xi, LD3xiC

Inventory control for storage tanks and silos, retrofitting

Bolt-On Strain Gauge Sensors
Load Cells

- Continuously reliable content measurement for all vessels and silos from 35 tons upwards
- Extremely durable (> 20 million measuring cycles)
- Simple installation on metal stands or silo skirts, including retrofitting
- For vertical legs and horizontal beams

Microcell, L-Cell

Inventory control for storage tanks and silos

Integrated Weighing System
Load Stand

- High-precision inventory measurement of medium to very large vessels and silos up to 450 tons
- Measurement accuracy up to 0.2 % due to four built-in Microcell strain gauge load cells
- Static load-bearing element with fixed bolted connection
- Earthquake rating possible

Load Stand II

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 ≥ 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

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: ±0,2 % ±1 mm/s

FMI, FMI-R

Flow measurement

Compact magnetic-inductive flowmeter

- Minimum effort for maintenance
- Compact electronic device with stainless steel housing
- High measurement accuracy and reproducibility: ±0,5 % ±2 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

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

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

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 AISI 316L
- Acceptance certificate 3.1 as per EN 10204
- Electropolished surface with $R_a \leq 0.8$ µm and 0.4 µm
- Surface inspection certificate
- Delta-ferrite measurement report
- Pressure certificate as per AD 2000
- Elastomers and plastics with USP Class VI approval

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

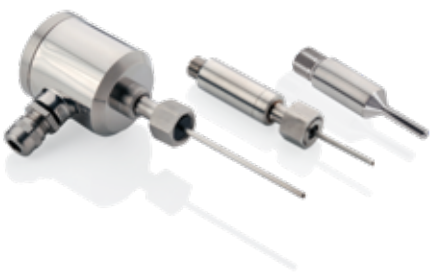
Temperature measurement in very small pipe diameters

Temperature measurement in pipes and vessels

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, $R_a \leq 0.8$ µm
  $R_a \leq 0.4$ µm optional

TS / TFP PHARMadapt ESP



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

TS / TFP PHARMadapt EPA

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, $R_a \leq 0.8$ µm
  $R_a \leq 0.4$ µm optional

TS / TFP CLEANadapt

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

TS / TFP Fermenter

Temperature measurement in pipes and vessels

Temperature sensor with Tri-Clamp connection

- Universal Tri-Clamp
- Rapid response time
- Electropolished temperature sensor, $R_a \leq 0.8$ µm
  $R_a \leq 0.4$ µm optional

TS / TFP Tri-Clamp

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

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

Content control for process vessels and tanks

Weighing Modules Load Disc

- Highly accurate dynamic content measurement based on the tank weight
- For all process, stirring and mixing tanks or horizontal tanks
- Solid, firmly bolted mounting between tank leg and foundation
- Nominal loads 100 to 11,500 kg
- Measuring accuracy up to 0.03 %

LD360s, LD3, LD3xi, LD3xiC

Hydrostatic level measurement

Climate-independent level sensor

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

SX

Pressure measurement in pipes and vessels

Modular pressure sensor

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

MPP

PHARMA

PRESSURE

Digital in-situ pressure display

Pressure monitoring in small pipe diameters

Pressure monitoring in pipes and vessels

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, $R_a \leq 0.2$ µm

MAN-90P-BAT

Compact pressure gauge 63 mm

- Extremely robust design for highest requirements
- Autoclavable
- Tri-Clamp 3/4", 1" and CPM
- Electropolished surface, $R_a \leq 0.2$ µm

EK

Pressure gauge 90 mm

- Extremely robust design for highest requirements
- Autoclaveable
- Adjustment of zero and span
- Electropolished surface, $R_a \leq 0{,}2$ µm

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, $R_a \leq 0.2$ µm
- 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, $R_a \leq 0.2$ µm
- Intrinsically safe (UL Class 1)

HA Autoclaveable

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

Flow measurement of demineralized water

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: ±0,2 % ±1 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: ±0,5 % ±2 mm/s

FMQ, FMQ-R

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 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

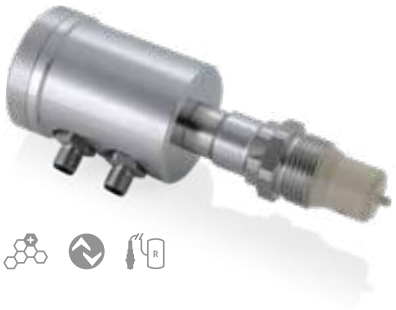
FTS

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



Quality control of products

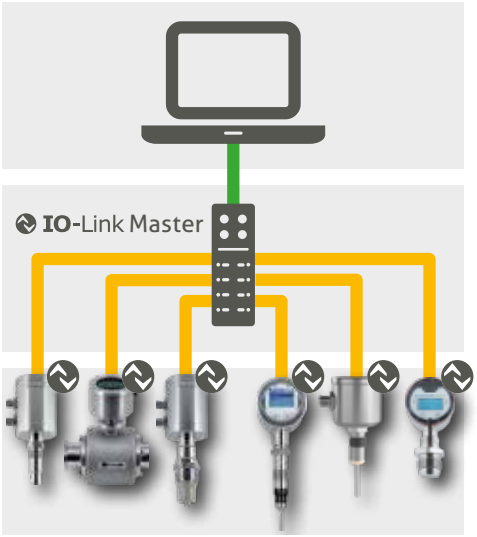
Turbidity sensors

- 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

FLEXHYBRID TECHNOLOGY

DIGITAL COMMUNICATION WITH IO-LINK



IO-Link

Sensors with digital IO-Link communication and Flex Hybrid technology make planning, commissioning and operating your plants easier, faster and more flexible.

Your key to greater efficiency

For the safe process control of an entire plant with a large number of measuring devices, control and operating elements, IO-Link offers significant advantages. We have opted for Anderson-Negele Flex Hybrid technology featuring IO-Link in parallel with the analog 4...20 mA connection.

Assembly and commissioning are extremely time- and cost-saving. For interference-free signal transmission and power supply itself, a three-pin standard cable without special shielding is sufficient. Each sensor is connected to the control center and can be parameterized via an IO-Link master. Thanks to bidirectional communication, potential faults, signs of wear or an increased risk of failure can be detected at an early stage, and production downtimes can be better avoided.

Plug-and-play takes on a new meaning: With IO-Link, sensor replacement is easier and safer than ever before and can be carried out independently, at any time and by any employee without any programming effort. For this purpose, the device configuration of each connected sensor can be stored in the IO-Link master. The new sensor is automatically recognized, configured and parameterized by the IO-Link master when it is plugged in and is immediately ready for use.

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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HYGIENIC BY DESIGN

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