



### PHARMA PRODUCTION. ASEPTIC BY DESIGN

For many years, our customers in the pharmaceutical industry and in biotechnology have trusted in sensors and measurement systems from Anderson-Negele. The processes employed in production 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 of the products.

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

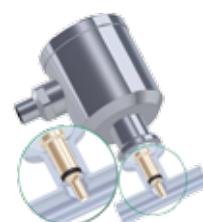
The PHARMadapt EPA process adaptation system even adapts temperature and point level sensors to pipes with very small nominal widths. The seal with exchangeable O-rings meets the technical requirements stipulated for lines in the pharmaceutical industry.

### PHARMadapt ESP

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

CPM technology from Anderson-Negele 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.





### TEMPERATURE MEASUREMENT IN ASEPTIC LINES



#### TFP PHARMadapt ESP



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



### TEMPERATURE MEASUREMENT IN VERY SMALL PIPE DIAMETERS



#### TFP PHARMadapt EPA



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



### TEMPERATURE MEASUREMENT IN PIPES AND VESSELS



#### TFP CLEANadapt



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





## TEMPERATURE MEASUREMENT IN BIOREACTORS



### TFP Fermenter



#### TEMPERATURE SENSOR WITH FERMENTER CONNECTOR

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



## TEMPERATURE MEASUREMENT IN PIPES AND VESSELS

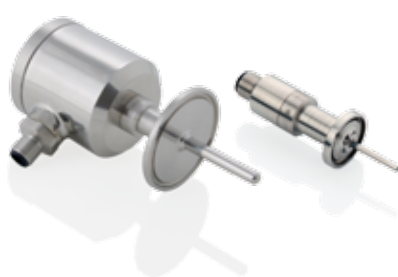


### TFP Tri-Clamp



#### 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



## DIGITAL IN-SITU TEMPERATURE DISPLAY



### FJ

#### TEMPERATURE SENSOR WITH DIGITAL DISPLAY

- » Large digital display (battery-operated)
- » Process connections for pharmaceutical applications
- » Materials in contact with the medium are FDA-compliant
- » Optionally available with switch output and external power supply







## POINT LEVEL

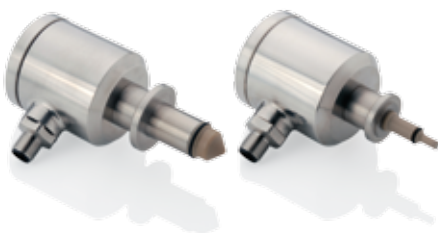
### POINT LEVEL DETECTION IN VERY SMALL PIPE DIAMETERS



#### NCS EPA

##### CAPACITIVE POINT LEVEL INDICATOR WITH PHARMadapt EPA

- » Dead-leg-free measuring point with O-ring designed for the pharmaceutical industry
- » EPA process connection for pipes from DN 10
- » Capacitive measuring principle – independent of medium conductivity
- » Insensitive to foam and adherence



### POINT LEVEL DETECTION IN PIPES AND VESSELS



#### NCS-31P Direct Connection

##### CAPACITIVE POINT LEVEL INDICATOR WITH DIRECT CONNECTION

- » Direct connection: Tri-Clamp, Varivent, BioControl and Ingold
- » Capacitive measuring principle – independent of medium conductivity
- » Insensitive to foam and adherence



### POINT LEVEL DETECTION IN PIPES AND VESSELS

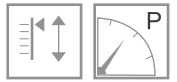


#### NCS-L Pharma

##### CAPACITIVE POINT LEVEL SWITCH FOR SINGLE OR DOUBLE WALLED VESSELS

- » Reliable alarm in pasty media
- » Rapid response time
- » Heated electronics to avoid condensation
- » Installation in vessels from above or below





## HYDROSTATIC LEVEL MEASUREMENT



### LA "Top Mount"

#### LEVEL SWITCH FOR MOUNTING FROM ABOVE

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



## HYDROSTATIC LEVEL MEASUREMENT



### SX

#### CLIMATE-INDEPENDENT LEVEL SENSOR

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



## PRESSURE MEASUREMENT IN PIPES AND VESSELS



### MPP

#### MODULAR PRESSURE SENSOR

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





### DIGITAL IN-SITU PRESSURE DISPLAY



EP

#### 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,  $R_a \leq 0.2 \mu\text{m}$



### PRESSURE MONITORING IN SMALL PIPE DIAMETERS



EK

#### COMPACT PRESSURE GAUGE

- » Nominal size 63 mm
- » Autoclavable
- » Tri-Clamp 3/4", 1" and CPM
- » Electropolished surface,  $R_a \leq 0.2 \mu\text{m}$



### PRESSURE MONITORING IN PIPES AND VESSELS



EM

#### PRESSURE GAUGE

- » Nominal size 90 mm
- » Autoclaveable
- » Adjustment of zero and span
- » Electropolished surface,  $R_a \leq 0.2 \mu\text{m}$





## DEAD-LEG-FREE PRESSURE MEASUREMENT IN SMALL PIPE DIAMETERS



### HA Mini CPM

#### COMPACT PRESSURE SENSOR WITH ASEPTIC CPM BUILD-IN SYSTEM

- » Dead-leg-free, front-flush pressure measurement with CPM process connection
- » 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)



## PRESSURE MEASUREMENT IN PIPES AND VESSELS



### HA Mini Tri-Clamp

#### COMPACT PRESSURE SENSOR WITH TRI-CLAMP

- » Tri-Clamp 3/4", 1", 1.5"
- » Front-flush pressure measurement for pipes 3/4" 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)



## PRESSURE MEASUREMENT IN PIPES AND VESSELS



### HA Autoclaveable

#### 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)







### FLOW MEASUREMENT IN FLASH PASTEURIZER



#### FMI

##### MAGNETIC-INDUCTIVE FLOWMETER

- » High measurement accuracy, even at low flow rates
- » Vacuum-tight, rigid meter tube lining, even at high temperatures
- » Pharmaceutical version available with all necessary certificates (e.g., FDA, USP Class VI)



### FLOW MEASUREMENT OF DEMINERALIZED WATER



#### HMP

##### TURBINE FLOWMETER

- » Cost-efficient and reliable alternative to magnetic-inductive flowmeters
- » Hygienic design for the pharmaceutical industry
- » Also usable in non-conductive media



### FLOW MONITORING/ DRY-RUN PROTECTION



#### FTS

##### CALORIMETRIC FLOW MONITOR

- » Calorimetric measuring principle with pulsed heating
- » Rapid response time
- » Sensor protection: automatic switch-off at  $T > 100\text{ }^{\circ}\text{C}$



## CIP PROCESS CONTROL



### ILM series

#### INDUCTIVE CONDUCTIVITY METER

- » Wear-free, inductive measuring principle
- » High reproducibility and rapid response time
- » Analog output for conductivity and temperature
- » Concentration measurement



## PHASE SEPARATION OF PRODUCTS



### ITM-3

#### TURBIDITY METER (BACKSCATTER LIGHT)

- » Front-flush mounted, hygienic sensor for medium to high turbidities
- » High reproducibility and rapid response time
- » Wear-free LED technology, no color dependency (wave length 860 nm)



## QUALITY CONTROL OF PRODUCTS



### ITM-4

#### TURBIDITY METER (4-BEAM ALTERNATING LIGHT)

- » Precise measurement at low to medium turbidities
- » 90° scattered light/4-beam alternating light method as per EN 7027
- » Compact device, no separate evaluation unit needed



## CONTROLS. INSTRUMENTATION AND CONTROLS.



### INSTRUMENTATION AND CONTROLS.

Special applications require specialized process control technology, because precise measurement results always influence the current production process. Anderson-Negele applies its expertise in the field of sensors for the development of appropriate process control equipment. Consequently, Anderson-Negele is able to offer a broad assortment of controllers and displays.

For the evaluation of measurement values in a wide variety of line controllers and control centers, Anderson-Negele provides 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 by Anderson-Negele for rapid and precise installation, simulation and calibration of sensors in your production line.



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Adherence to industry standards is a matter of course for Anderson-Negele – within the field bus system, when building control equipment in DIN-compatible housing into your line or when providing protection against rough ambient conditions.

When you rely on Anderson-Negele instrumentation and control, you are well on your way to process automation.





# CONTROLS



## BUS COUPLERS, CONTROLLERS, SWITCH CONVERTERS

### DECENTRALIZED FIELD BUS CONNECTION



#### NRL

##### MODULAR I/O SYSTEM WITH FIELD BUS COUPLER

- » Configuration by means of modular system, optimally adaptable to the application
- » System can be readily expanded using plug-in modules
- » Hot-swapping of modules during system operation



### PROCESS PARAMETER CONTROL



#### NKS

##### COMPACT PROCESS CONTROLLER FOR ALL TASKS

- » Intelligent BluePort® interface
- » Various certifications (DIN 3440, cUL, GL)
- » Maintenance manager and error list



### SIGNAL CONVERSION AND PROCESSING



#### NCI, VTV, VMU

##### PROGRAMMABLE UNIVERSAL SWITCH CONVERTER

- » Conversion of standardized signals
- » Universally configurable via operating panel or BluePort® interface (NCI)
- » High sampling rates





## POINT LEVEL DETECTION AND CONTROL



### VNV, ZNV

#### EVALUATION ELECTRONICS FOR CONDUCTIVE POINT LEVEL INDICATORS

- » Selectable digital or relay output
- » Only one device for up to four sensors
- » Devices for different control tasks



## IN-SITU DISPLAY OF PROCESS PARAMETERS



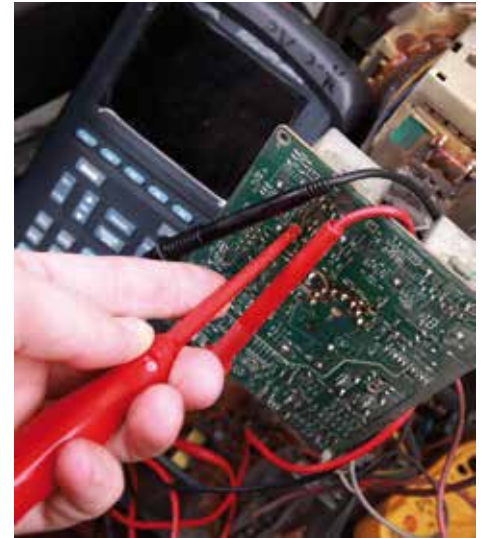
### DPM, PEM

#### PROGRAMMABLE UNIVERSAL DIGITAL DISPLAYS

- » Universally programmable
- » Universal power supply unit 24 V...230 V AC/DC
- » 4-digit LED display



## VERIFICATION AND CALIBRATION



### HSM-P, HSG-3

#### SIMULATORS FOR PT100 AND STANDARDIZED SIGNALS

- » Simulation of standardized signals
- » Line-independent supply through NiMH battery
- » Handy, lightweight instrument



## OUR STRENGTHS.

# HYGIENIC BY DESIGN

### ANDERSON-NEGELE GLOBAL TECHNOLOGY LEADER IN HYGIENIC INSTRUMENTATION

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 35 years. As a pioneer of hygienic measuring equipment, we have focussed on the special needs of the food, beverage and pharmaceutical industries 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 DANAHER Group of companies – a global "Fortune 200" technology leader – Anderson-Negele practices the successful Danaher Business System (DBS). With the help of DBS, we ensure the high quality of our products in development and production and continuously improve our processes and methods.

ANDERSON-NEGELE – WE GROW WITH OUR CUSTOMERS.





HYGIENIC BY DESIGN

**ANDERSON-NEGELE**

## ANDERSON-NEGELE WORLDWIDE

In 2004, Negele Messtechnik GmbH joined with the USA-based Anderson Instrument Company, a renowned specialist with more than 80 years expertise in hygienic process instrumentation. Known globally under the Anderson Negele brand, Anderson-Negele has a reputation as a leading manufacturer of top-quality hygienic sensor solutions and application expertise.

Today, Anderson-Negele globally serves customers in the food-processing and pharmaceutical industries as well as OEMs and system integrators. Each of our employees is uniquely dedicated to your requirements and wishes. Our product spectrum includes sensors for temperature, level, pressure, flow, conductivity and turbidity measurement as well as innovative solutions for optimizing your production process. Our products meet the required 3A, EHEDG and BPE design standards.

With manufacturing facilities in the United States and Germany and sales and service offices in the U.S., Europe, China, India and Mexico, Anderson-Negele is your reliable and flexible partner for hygienic instrumentation, sensors and application processes.

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SENSORS FOR FOOD AND BIOPHARMA.



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