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## SensoGate® Sensor Lock-Gates

**Manual and automatic retractable fittings with pioneering design innovations, for applications in hygienic areas**

SensoGate® WA differs fundamentally from all conventional retractable fittings on the market. The new products excel thanks to a large number of advantages and enable rapid amortization via considerable savings of time and money.

### A patented leap in technology

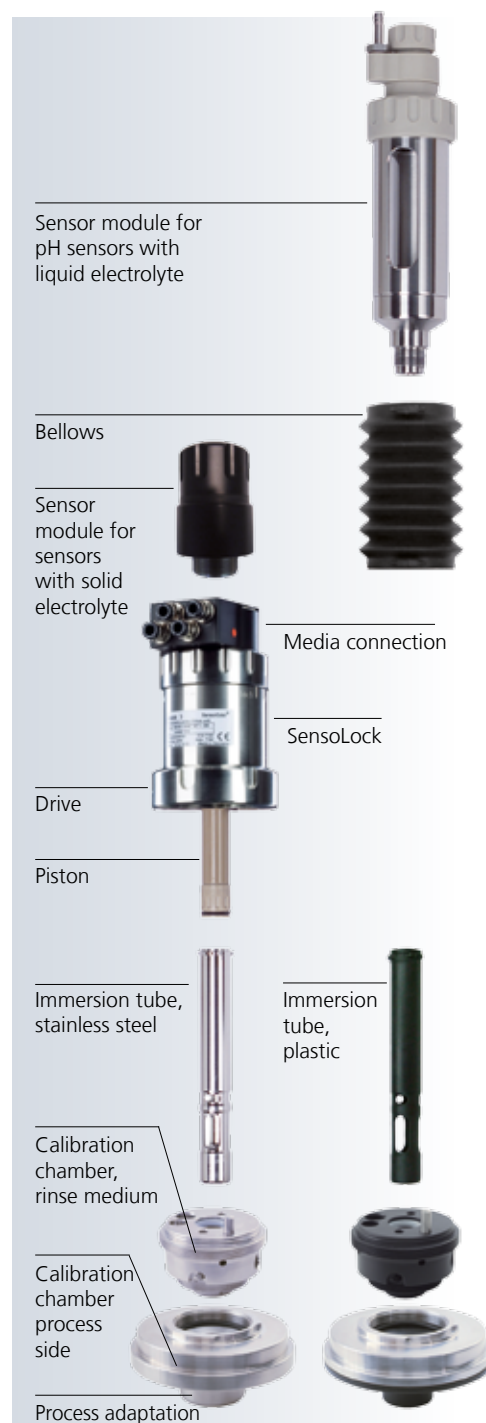
With the SensoGate® WA series of sensor lock-gates, Knick has succeeded in markedly improving the previously practiced principle of the push rod mechanism. The results are as pioneering as they are customer-friendly: 80 % time savings during initial installation compared to other devices and up to 70 % time savings when replacing wearing parts. The benefits of genuine and unique modularity are seen here: for example, the immersion tube can be replaced in a single movement – without removing the entire fitting. The drive unit with the immersion tube can be disconnected from the calibration chamber and the process adaptation by loosening a single coupling nut.

### Unique variability

This exemplary modular design allows easy selection of various materials (1.4571, 1.4435, PVDF, PEEK, PP) for the process-wetted parts. Furthermore, the SensoGate® can be combined with a wide range of process connections. Simple exchange of a sensor module allows SensoGate® to operate with both polymer or gel electrolyte sensors as well as pressurizable liquid-electrolyte sensors.

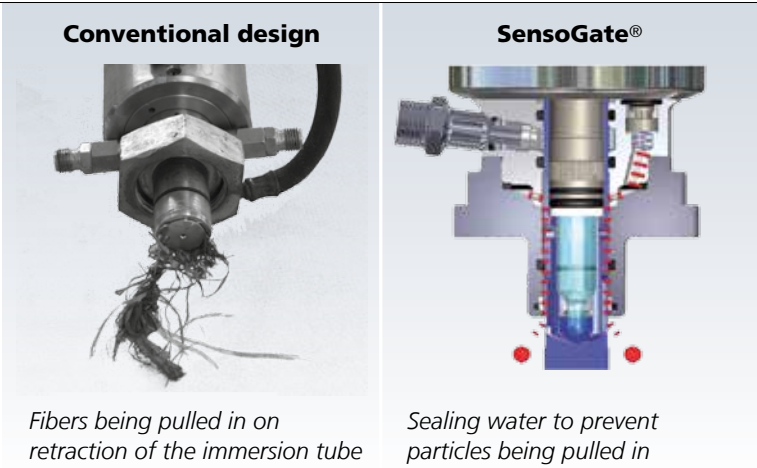
### Modular design

Using the example of the fully automatic SensoGate® WA 130 retractable fitting for pH sensors with liquid electrolyte:



### Reduced Wear

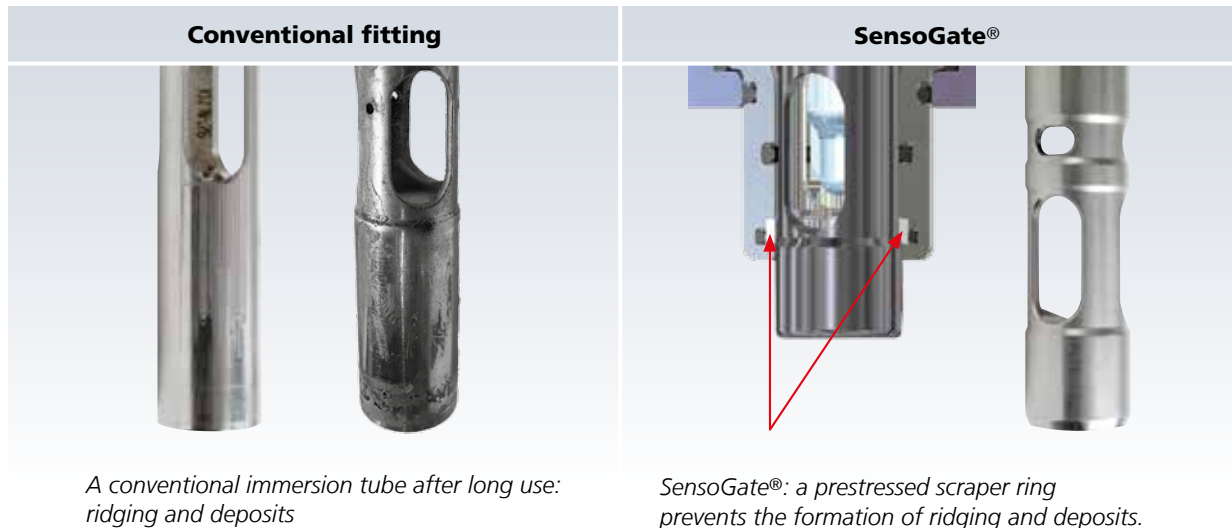
The completely new lock-gate principle of SensoGate® reliably seals off the process in every situation and provides an additional sealing water function – without external non-return valves. As the outlet is blocked off during probe motion, the supplied rinse water flows through the gaskets toward the process. During retraction, the sealing water prevents fibers or particles being drawn in with the immersion tube which protects the seals. Pre-tensioned scraper rings remove deposits before they reach the seals.



### Superior Functionality

Mechanical wear on the immersion tube is the most common cause of faults in conventional retractable probes. Ridging covers the sealing O-rings and causes damage to the sealing surfaces. The reason for this wear is a mechanically overdetermined bearing, through which the immersion tube is forcibly guided through the calibration chamber and process adaptation. With well-known consequences: misalignment, ridging, etc.

With the special cardanic bearing in SensoGate®, the immersion tube rests on a floating bearing for the first time in retractable fittings, balancing out stresses and forces. As a result, the prestressed O-rings only absorb axial forces as bearing points, and seal wear is reduced to a minimum.



# Modular Retractable Fittings

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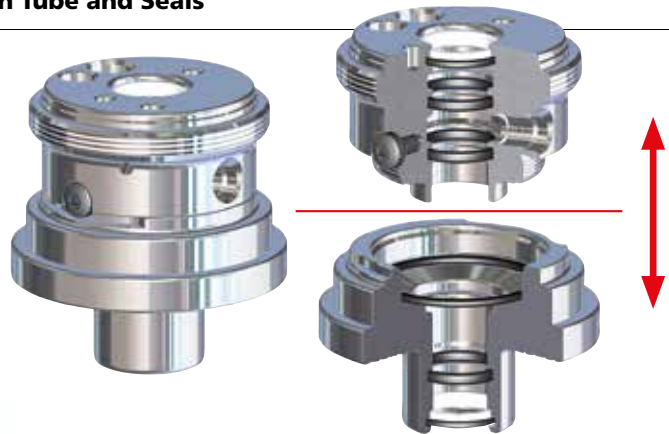
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## SensoGate® Sensor Lock-Gate

### Extremely Quick Replacement of Immersion Tube and Seals

All SensoGate® gaskets are easily accessible due to the divided calibration chamber. An optional tool even facilitates the rapid replacement of several O-rings in only 30 seconds. The replacement of the immersion tube by means of the bayonet coupling takes no time at all; simple retrofitting of stainless steel to Hastelloy or carbon-fiber reinforced plastic is even possible in this way.



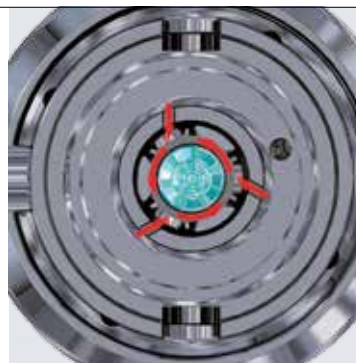
*Easily accessible gaskets due to divided calibration chamber: Upper part of calibration chamber, lower part of calibration chamber (process-wetted)*



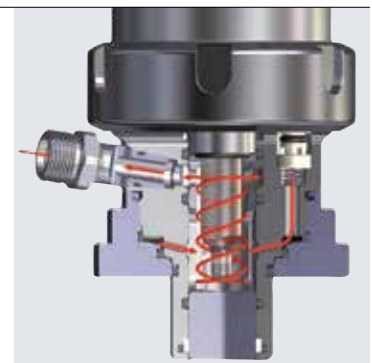
*Simple simultaneous replacement of all O-rings in just 30 seconds!*

### Highly Efficient Cyclone Rinsing for Optimum Cleaning

SensoGate® works efficiently and hygienically – up to the top O-ring on the drive side in the calibration chamber. The cleaning of the sensor is optimized and takes place by means of a ring-shaped nozzle configuration and the newly developed tangential routing of the media flow – combined with a high flow rate. By maintaining invariable geometric conditions, a locking device between the drive unit and the immersion tube ensures a defined flow to the sensor in the process.



*Annular arrangement of nozzles*

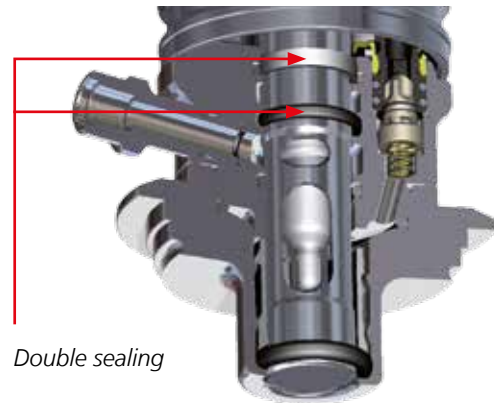


*Tangential routing of the media flow*

### Unique Effectiveness of Seals

In conventional designs, process medium or calibration and rinsing medium enter the drive unit via defective O-rings. Conversely, compressed air gets into the calibration chamber and falsifies the analysis results. Microbial contamination of the drive unit and consequently hygienic problems are also common.

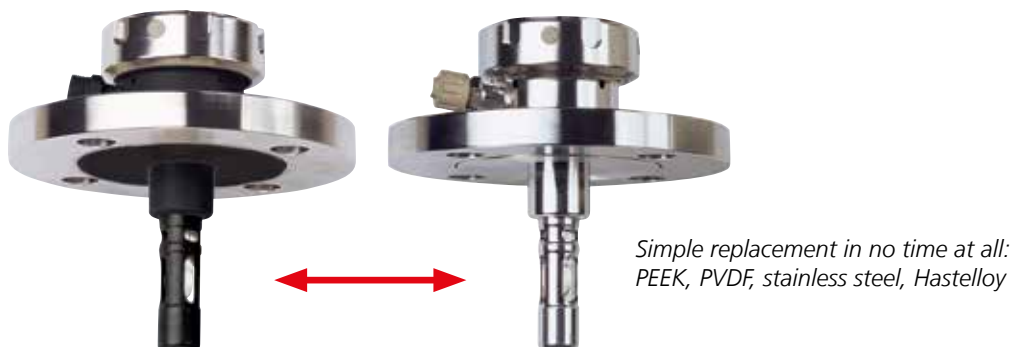
With SensoGate®, a double seal and systematically positioned leakage bores between the drive and the calibration chamber prevent control air from penetrating into the calibration chamber just as securely as they prevent the penetration of liquids into the drive cylinder. The sensor assembly drive can easily be separated from the calibration chamber by removing the union nut.



### More Affordable Materials as a Genuine Alternative

Calibration chambers and immersion tubes for SensoGate® are available in carbon-fiber-reinforced, chemical, thermal, and mechanical highly resistant plastics. This allows them to be used for the first time at a great cost advantage where previously only extremely expensive materials (e.g. Hastelloy, titanium etc) could be used. The PEEK, PVDF, or PP immersion tubes are manufactured using special technology without cutting and exhibit a particularly smooth high-quality surface with enclosed internal carbon fibers.

In addition to the price there is another enormous advantage: The carbon-fiber-reinforced plastics used by Knick have thermal expansion characteristics similar to those of steel. There are no longer any pressure restrictions on the permissible temperature range, due to the division into pressurized components made of steel and process-wetted materials made of carbon-fiber-reinforced plastic. The pressure stability is the same at room temperature as it is at 140 °C. The sandwich construction with stainless-steel flange adapter guarantees back-up in the event of pressure surges.



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## SensoGate® Sensor Lock-Gate

### Design Innovations

SensoGate® offers new solutions to old problems. Greater immersion depths are not achieved by using long and therefore particularly fragile glass sensors, but by engineering an extension of the stable piston. This is always protected from contamination and, just like the shorter versions, allows uncomplicated replacement of the sensor in a single movement.



*Deeper immersion with standard sensor lengths (225 mm)*

### Deeper Immersion

The SensoGate® lock-gate principle allows a greater sensor immersion depth than with existing retractable fittings. Even on the short version, the sensor immersion depth is 65 mm (lower edge of fitting flange to tip of

sensor). The total immersion depth (to end of immersion tube) is pleasingly short at just 88 mm. This allows a considerable sensor immersion depth even under constricted installation conditions (e.g. tubes

with small diameters). This also guarantees that the sensor is reliably immersed in the process medium beyond the dead flow space of the flange.

### Simple and Fast

On previous retractable fittings, the immersion depth is often measured from the side of the fitting flange away from the process; this reduces the effective sensor immersion depth further by the thickness of the flange. To obtain even greater immersion depths – e.g. for use in coated and heat-insulated boilers – a version with a 143 mm immersion depth is available. Another key feature – all immersion depths are achieved with a short sensor length of just 225 mm. This eliminates the need for expensive 425 mm long glass electrodes; handling is easier and the likelihood of electrode breakage is significantly reduced.

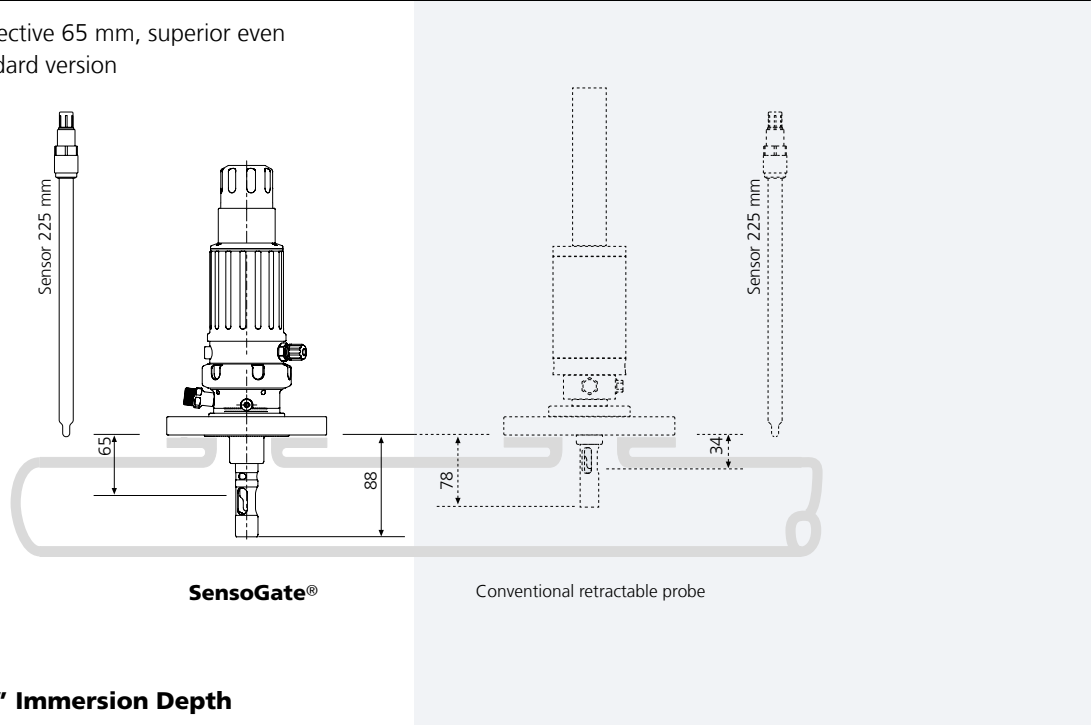
#### SensoGate® immersion depths

Flange	65 (88)	Short
DN 32 – DN 100	120 (143)	Long
Dairy pipe	65 (88)	Short
DN 50 – DN 100	120 (143)	Long
ANSI flange	65 (88)	Short
1 1/2" – 3"	120 (143)	Long
Ingold socket	71 (94)	Short
	126 (149)	Long

(65 = until sensor tip / (88) = until end of tube)

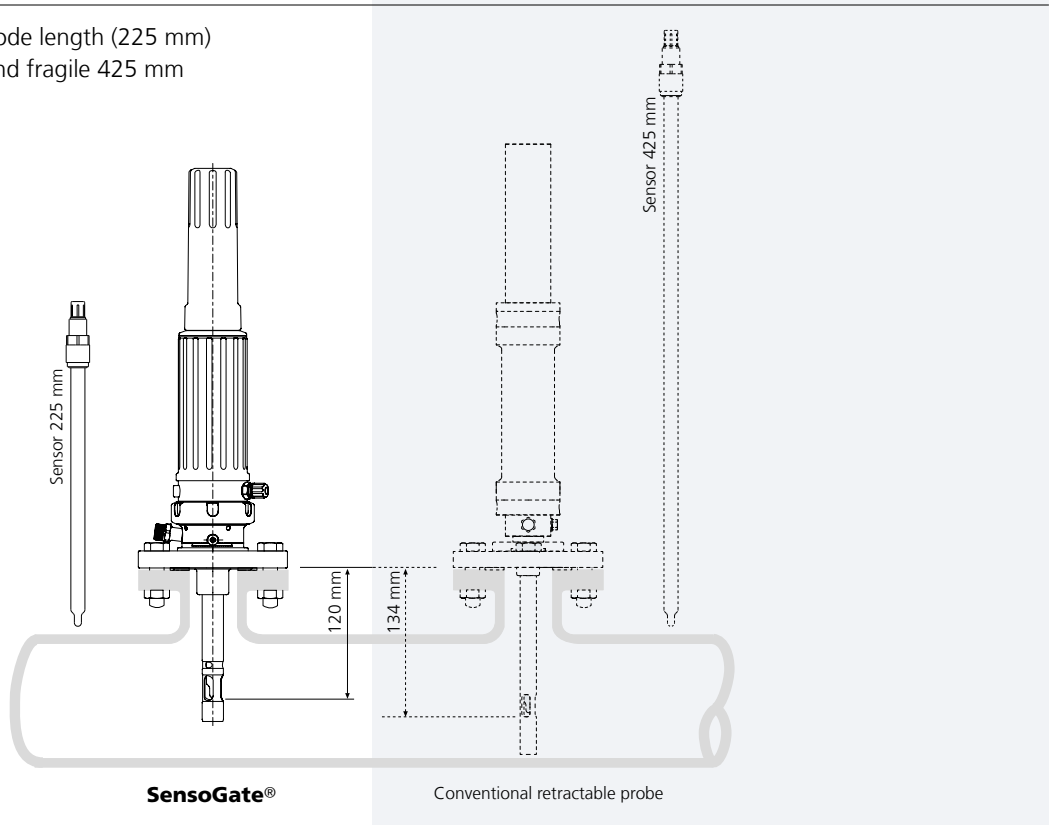
### The "Short" Immersion Depth

- with an effective 65 mm, superior even in the standard version



### The "Long" Immersion Depth

- standard electrode length (225 mm)
- no expensive and fragile 425 mm electrodes





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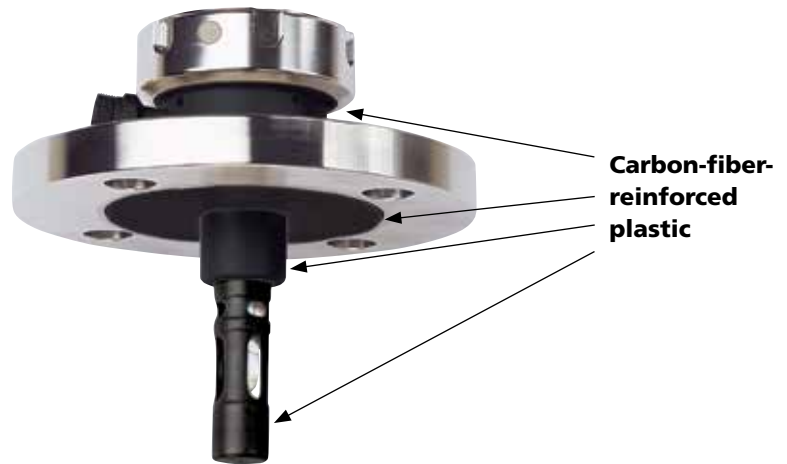
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## SensoGate® Sensor Lock-Gate

### ATEX Approval for Non-electric Equipment

SensoGate® fittings are approved for operation in hazardous areas in accordance with qualifications II 1 GD c II. High-quality carbon fiber materials guarantee dissipative surfaces, also for the plastic versions. Identical components are used in the hygienic versions.



### Made in Germany

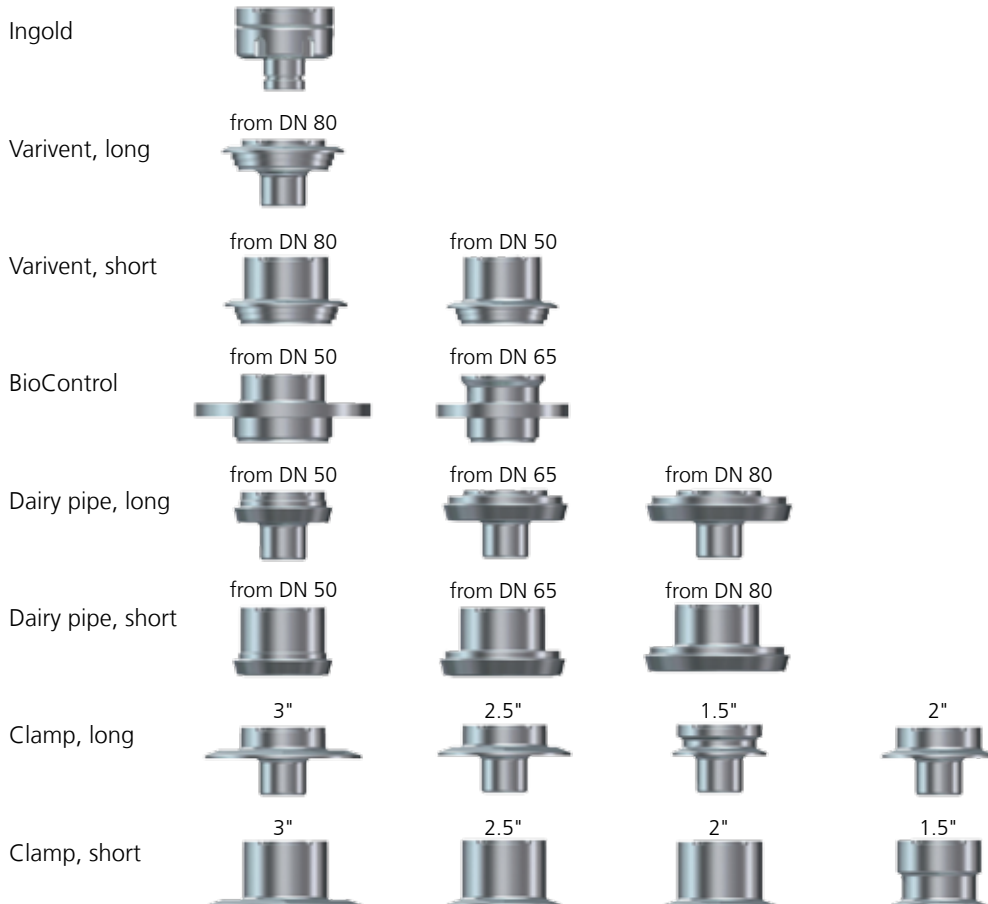
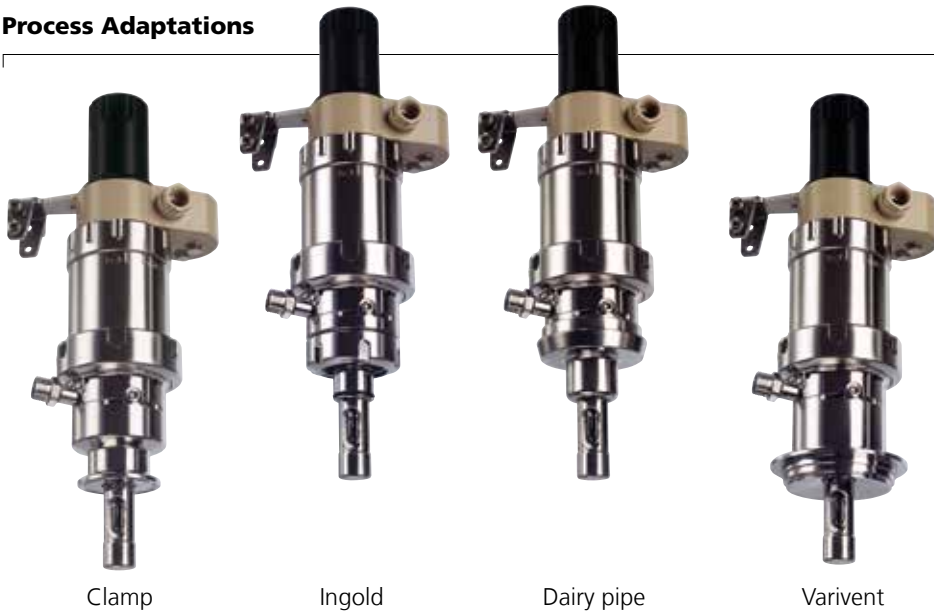
Bucking the trend to outsource production, the fittings are manufactured, assembled, and tested at Knick's own Berlin headquarters. This reflects our belief in keeping our core competences in-house and in creating highly specialized areas of production which cannot be expected of suppliers on contract

with such a consistent level of quality and flexibility. These production conductions also enable Knick to respond to orders without delay. Each component is engraved with its own number directly at the machine. This documents precisely and in detail which customer gets which components. This unique traceability

permits, for example, a test certificate to be supplied for each individual fitting on request, even years later.



**Process Adaptations**





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## SensoGate® Sensor Lock-Gate

### System Overview

#### SensoGate® for process applications

##### WA 130

Pneumatic; also for use with fully automatic control units

For use in chemical industry processes, energy generation, and water/waste water.

- modular design
- central multiplug for all rinsing, cleaning, and calibration media
- effective rinsing

- easy maintenance
- high availability
- ATEX approval II 1GD c II for the complete fitting
- almost all typical process connections
- large selection of materials in contact with the process



##### WA 131

Pneumatic; for simple commercially available control units

For use in chemical industry processes, energy generation, and water/waste water.

- modular design
- effective rinsing
- easy maintenance

- high availability
- ATEX approval II 1GD c II for the complete fitting
- almost all typical process connections
- large selection of materials in contact with the process



##### WA 131 M



Manual; with new, safe-to-operate rotary drive

For use in chemical industry processes, energy generation, and water/waste water.

- modular design
- effective rinsing
- easy maintenance
- high availability

- ATEX approval II 1GD c II for the complete fitting
- almost all typical process connections
- large selection of materials in contact with the process
- safe handling of rotary drive unit up to 10 bar process pressure



## System Overview

### SensoGate® for hygienic applications

#### WA 130 H

Pneumatic; for use with fully automatic control units in hygienic applications

For use in hygienic processes in the pharmaceutical and food industries.

- modular design
- central multiplug for all rinsing, cleaning, and calibration media
- additional connection for superheated steam or chemical applications
- effective rinsing

- easy maintenance
- high availability
- wide range of hygienic process connections
- steam-sterilizability is validated for all process-wetted parts incl. rinsing/calibration chamber
- SIP and CIP capable



#### WA 131 H

Pneumatic; for simple commercially available control units in hygienic applications


For use in hygienic processes in the pharmaceutical and food industries.

- modular design
- effective rinsing
- easy maintenance

- high availability
- wide range of hygienic process connections
- steam-sterilizability is validated for all process-wetted parts incl. rinsing/calibration chamber
- SIP and CIP capable



#### WA 131 MH

 Manual/hygienic; with new, safe to operate rotary drive

For use in hygienic processes in the pharmaceutical and food industries.

- modular design
- effective rinsing
- easy maintenance
- high availability

- wide range of hygienic process connections
- steam-sterilizability is validated for all process-wetted parts incl. rinsing/calibration chamber
- SIP and CIP capable
- safe handling of rotary drive unit up to 10 bar process pressure

