

The Art of Measuring.

**Knick** >

# Tough as They Come.

## Ceramat

Retractable fittings  
for extreme conditions.  
With ceramic sealing  
to the process.



- Minimum wear
- Low operating costs
- Maximum availability

# The Solution: Ceramat

Patented retractable fitting with ceramic sealing to the process. Harder than steel. Designed as a solution to difficult applications in which conventional fittings with O-ring seals fail.



## Unique Lock-Gate Principle

With Ceramat, the usual O-ring seal problems occurring in conventional retractable fittings are eliminated. Two planar ceramic disks that rotate toward each other to separate the calibration chamber from the process perform the sealing function. Ceramic sealing is extremely resistant to chemical, thermal and mechanical influences, guaranteeing maximum availability.



*Two planar ceramic elements rotate toward each other to separate the calibration chamber from the process.*

## Maximum Process Safety

Ceramat retractable fittings have been proven effective for extremely difficult processes. The process-wetted outer housing (PVDF, PEEK, steel, Hastelloy or titanium) always remains static and is therefore not subjected to mechanical stress.

## Maintenance without Process Interruption

Ceramat's well thought-out design enables what little maintenance work there is to be carried out on site easily. A unique feature is the easy removal of the entire drive unit under full process conditions. The process medium – whether it's corrosive, hot, toxic and/or under pressure – remains reliably isolated. If the sensor is broken, the calibration chamber can be cleaned under process conditions.





*The unit is driven by a compact pneumatic rotary-lift motor with positively controlled, integrated valves. It can be removed without process interruption.*

### For Tough Applications

- Highly corrosive processes (chlorine production, phosgenation)
- Processes with depositing, abrasive and incrusting solids: flue gas desulfurization, gas scrubber, sugar production (1st + 2nd carbonatation), dyes and pigment synthesis, special crust-forming industrial wastewater
- Pulpy, fibrous media (cellulose, cosmetics, food)
- Organic and sticky residues (refinery wash water, starch production)
- Processes with highly toxic substances, such as phosgene gas and hydrogen cyanide



### Facts and Features:

- Maximum availability
- No wear or maintenance
- Versatile process adaptations
- Plug & play for all process media thanks to central multiplug
- Cyclone rinsing for optimum cleaning effect
- Ceramic sealing to the process:
  - Extremely hard (Mohs scale 9)
  - High, constant tightness
  - High mechanical strength
  - High temperature resistance
  - Can be sterilized
  - Virtually universal chemical and mechanical resistance
- Drive easy to replace under process conditions

# Ceramat WA 150/153

Compact pneumatic retractable fittings with application-specific process adaptations.



Robust retractable fittings with superior sensor immersion depths. For operation with electrochemical sensors ( $\varnothing$  12 mm) or optical sensors ( $\varnothing$  12.7 mm).

## Ceramat WA 150

Choice of process-wetted materials:

- PVDF (carbon fiber-reinforced)
- PEEK (carbon fiber-reinforced)

## Ceramat WA 153

Choice of process-wetted materials:

- Stainless steel 1.4404
- Titanium
- Hastelloy C 22

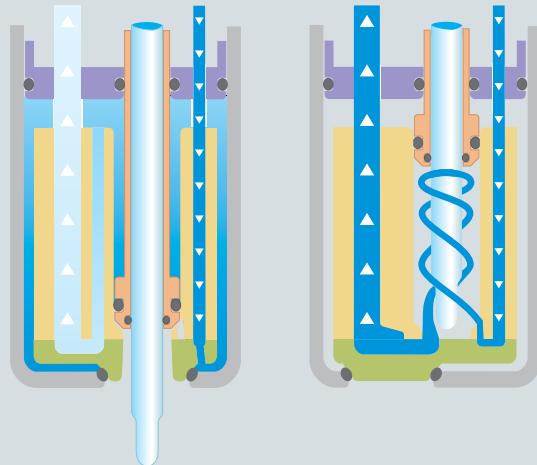


**For pressurizable sensors  
with liquid electrolyte:**

- Use in highly difficult processes with tendency toward sensor contamination and junction clogging
- Pressurizable housing for acceptance of liquid-filled sensors with electrolyte reservoir, length 250 mm
- Automatic pressure application via the Unical 9000 controller

**For low-maintenance sensors  
with solid electrolyte:**

- Virtually maintenance-free thanks to the use of sensors with gel, paste or polymer electrolyte (length 225 mm)
- Compact shape with greater immersion depth



*Cavity rinsing*



# Ceramat WA 154

Pneumatic retractable fitting with variable immersion depth up to 300 mm.



Flexible immersion fitting; customer-specific immersion depths from 150 mm to 275 mm. This retractable fitting is dimensioned for operation with electrochemical sensors ( $\varnothing$  12 mm) with a length of 425 mm or 450 mm for pressurizable sensors or optical sensors ( $\varnothing$  12.7 mm).

- Gaskets can be replaced when process is running
- ANSI flanges can be used from 50 DN and 2"
- Torsion protection for fiber-optic sensors
- Pressure resistance of 10 bar at 140 °C
- Safety pressure up to 40 bar at 140 °C

Choice of process-wetted materials:

- Stainless steel 1.4404
- Titanium
- Hastelloy C 22

## Ceramat WA 154 and WA 160

The Ceramat versions with particularly high immersion depths were specially developed for measurements in conduits, in thick-walled thermally insulated reactors and large containers in which the measurements are taken at a distance from the outer wall.

# Ceramat WA 160

Fully automatic retractable fitting with high immersion depth up to 2000 mm.



Long immersion fitting for use in tanks, basins and conduits. For operation with electrochemical sensors with diameters of 12 mm.

- Immersion depths of 600 to 2000 mm
- Immersion tube diameter only 65 mm
- Simple sensor replacement, even for 2000 mm immersion depth
- Sensors: 225 mm long with solid electrolyte (gel, paste, polymer, etc.)
- 2 independent barriers with cavity rinsing

Choice of process-wetted materials:

- Stainless steel 1.4571
- Corrosion proof: polypropylene (PP) or polyvinylidene fluoride (PVDF)
- Hygienic: polished stainless steel 1.4435



# Fully Automated, Systematic Process Analysis

**Ceramat Retractable Fitting  
Unical 9000 Controller  
Protos 3400 Process Analysis System**



Thanks to the consistent use of state-of-the-art technology, Knick has developed a fully automated measuring loop with a uniquely high level of safety and reliability. For the first time, immersion fittings can be automatically cleaned and calibrated without contamination of the process medium through cleaning or calibration fluids.

Calibrate

Adjust

Clean

Measure



**Unical 9000**  
controller

**Protos 3400**  
process analysis system



Metering pumps with cleaning and calibration solutions



Ceramat  
retractable fitting

pH sensor

### Protos 3400

The modular measuring system from Knick – also for hazardous areas. Optionally available in hygienic stainless steel enclosure or with corrosion-proof powder coating. For measurement with analog and digital sensors.

- 4-wire system with 2 explosion-protected active outputs
- Simple retrofit or conversion thanks to modular structure
- Measuring modules for pH value, conductivity and dissolved oxygen plus modules for additional outputs, controllers, the Unical control system, PROFIBUS PA and Foundation FIELDBUS.
- VariPower power supply unit for 20 to 253 V AC/DC

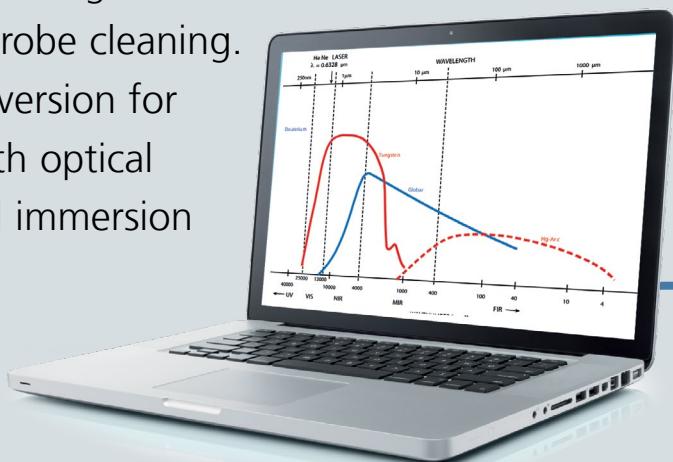
### Unical 9000

Electro-pneumatic controller for minimum maintenance effort with maximum reliability: Thanks to special metering pump technology with separated media routing, Unical 9000 delivers maximum reliability and precision.

- Simple system expansion thanks to modular concept
- Fully encapsulated electronic controller and valves in housing
- Auxiliary power supply from the Protos system
- External media connection for buffer and cleaner
- Extremely low buffer consumption
- Also available for explosion-protected areas

# Ceramat for Process Spectroscopy

Reliable process management with in-process probe cleaning. Special Ceramat version for measurement with optical fibers and optical immersion probes.



For the combination with conventional classical or compact spectrometers (IR, NIR, UV/VIS and Raman)



## Clear View of the Process

Ceramat is also suitable for the use of optical probes with modern process spectrometers (UV/VIS/NIR/IR/Raman) that are adapted directly to the pipeline or reactor. Optical probes require a completely clear sensor view into the process. Due to their design, this is impossible with conventional sliding bar fittings.



## Obstructive Contamination

Many media generate contamination effects that obstruct the optical window. If a probe was contaminated in the past, the measurement had to be aborted or it was necessary to wait for the production system's next cleaning interval to clean it.

## Effective Solutions

In partnership with Hellma and tec5, Knick developed a procedure for the automated cleaning of optical immersion probes. The spectrometer software detects optical window contamination via the measuring signal, and the probe is cleaned as required or automatically at specific intervals.

**Unical 9000**

for controlling the  
cleaning process



**Optical Falcata**  
immersion probe  
in combination  
with **Ceramat**  
retractable fitting

**The Technology of the Future**

The Ceramat retractable fitting with the Unical 9000 cleaning and calibration system was specifically modified to meet the requirements of spectroscopy with optical fibers and optical immersion probes:

- Sensor replacement without interrupting the process
- Probe cleaning outside the process
- Special ceramic process sealing
- Rinsing the probe with up to 4 cleaning/calibration fluids and drying with compressed air.

To optimize functional safety, Knick developed a special torsion protection feature for fiber-optic connection.

## Knick The Art of Measuring

Knick has been among the leading manufacturers of electronic measurement devices for process analysis for more than 70 years. Today, the company alignment is still focused on a high technical level and an intensely innovative orientation.

The current product range of Knick includes unique device series also for extremely difficult applications. As a system provider, Knick can guarantee expert analysis of your measurement requirements and provide qualified advice for complete measurement loops.

### **Process Analytics**

- Industrial transmitters
- Fittings
- Automatic cleaning and calibration systems
- Sensors
- Portables
- Laboratory meters

**Knick**  
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