



Polished stainless steel for food and pharmaceutical applications



Powder-coated steel for corrosive environments

Maximum availability of the point of measurement: Cleaning without interrupting the process, even when measuring directly in the pressure tank

Since the sensor is not removed for cleaning, the process can continue uninterrupted. This allows problem-free measurements in a pressure tank or in the main pipe. Elaborate and lockable bypasses are eliminated and accuracy increases.

Low maintenance

Fully automatic sensor calibration in user-defined intervals without interrupting the process. Two buffer solutions are automatically pumped into the calibration chamber. Only the buffer bottles need to be refilled.

Clean and safe construction

All features for smooth, safe, and low-maintenance operation are provided as standard: water pressure gauge and service switch with alert message and check-back signal of the actual probe position, air filter and water trap integrated, flooding sensor with alert message.

Universal adaptation to retractable fittings

The modular structure of the Unical allows any retractable fittings to be used. Optimum functionality is achieved with the Ceramat and SensoGate sensor lock-gates

Safe and easy measurement, even in strongly polluted media

Sensor cleaning and rinsing are performed at user-defined intervals. Cleaning solution and water are automatically pumped into the calibration chamber. Dismounting and manual cleaning of the sensor are not required.

Distinction between calibration and adjustment

This allows you to check the sensor data in the running process. An adjustment is only carried out when pre-set deviations of the calibration values are exceeded. Constant displacement of the measured values due to small calibration scatters is omitted.

Modern fieldbus integration

The interfaces to PROFIBUS PA or FOUNDATION Fieldbus allow the Unical system to be integrated directly in a fieldbus network. Naturally also in hazardous locations.

Long sensor life – also in critical processes

When measuring in aggressive media or at high process temperatures, the sensor rests in the calibration chamber and is only briefly moved into the process for measurement. This method decisively increases the sensor life.

Cost-efficient

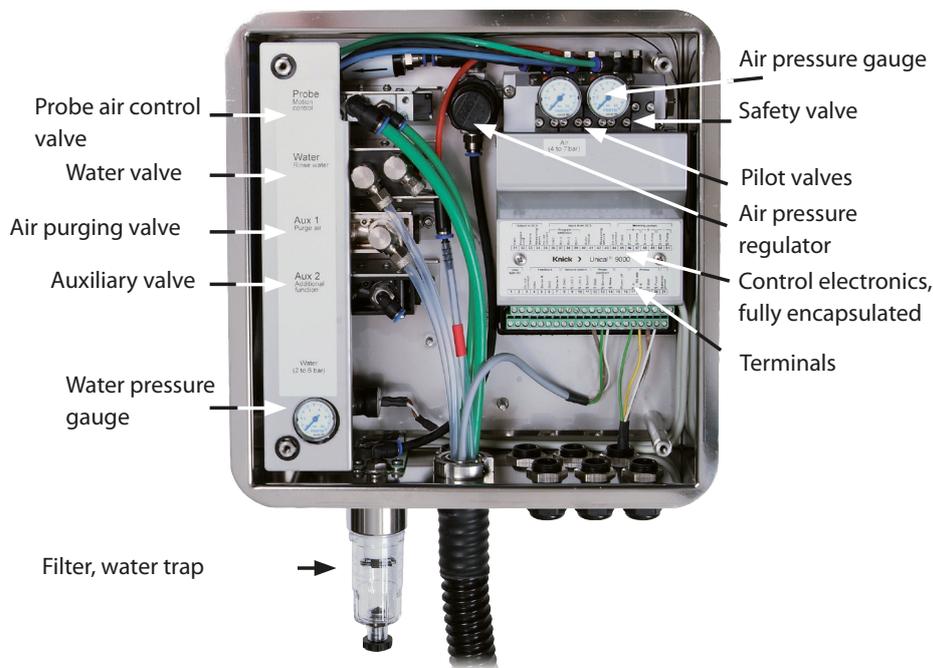
Low-wear and low-maintenance pump with extremely low consumption of buffer.

Unical 9000

The electro-pneumatic controller for fully automated pH measurement, cleaning and calibration

In combination with the Protos process analysis system and the SensoGate or Ceramat sensor lock-gates, Unical offers the ideal functionality of a complete system for automatic process control of a pH measurement. It allows highly accurate measurements to be taken, even with difficult process conditions such as high pressure, high temperatures, and high levels of impurities. The system can be installed next to the process, within the hazardous area.

Inside View



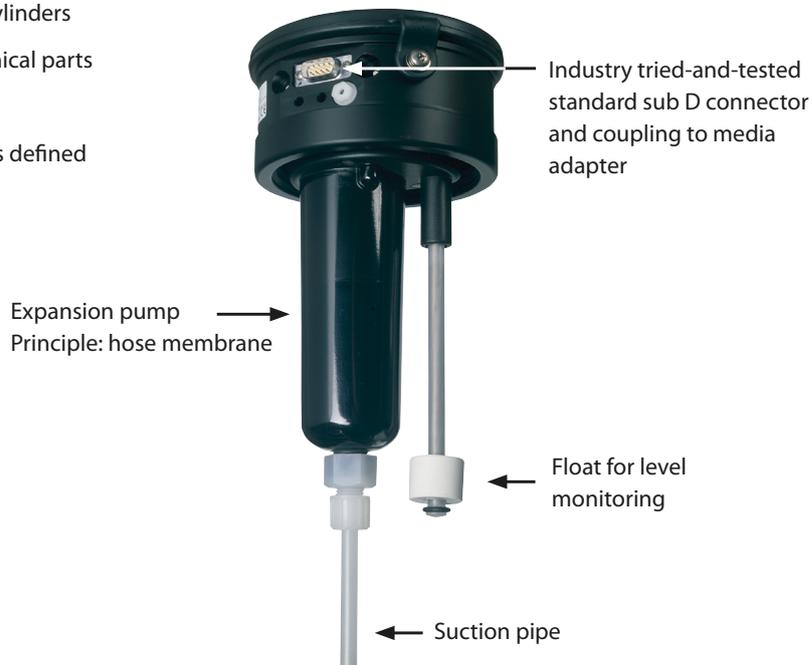
The valve units are expandable.

Facts

- consistent enclosure concept for all devices
- modular design, adaptable to virtually every measuring task
- easy assembly and retrofitting
- tidy hose guiding
- hygienic version (polished stainless steel) or corrosion-proof (powder-coated steel)
- no entrainment and backmixing due to separate routing of the media
- low maintenance effort due to innovative pump technology and extremely low consumption of media
- automatic 2-point calibration
- time-controlled cleaning and checking
- cleaning with water and additional cleaning solution
- reduced maintenance effort due to automatic calibration
- no interruptions in production for calibration
- operation in hazardous locations Zone 1 (all system components)
- longer sensor life due to short-time measurement and regular cleaning
- immediate readiness for measurement after production interruption since sensor is safely stored in liquid
- safety ensured by monitoring of the compressed air and water supply, the probe position and the buffer and cleaning solution level

New, Innovative Pump Design for Low Maintenance Costs

- no usual pistons/cylinders
- no moving mechanical parts
- no wear
- no stored energy as defined in ATEX 94/9/EC



Modular Flexibility for Very Simple Adaptation

- The buffer or cleaning solution bottles (3.5 l) are replaceable active, self-sustaining units with integrated pump: easy refilling of buffer or cleaning solution, without removing the pump.
- The pump units are automatically recognized by the system.
- The closure consists of a conveyor cap with funnel and buttoned lid.
- This innovative construction provides previously unknown flexibility and service friendliness.

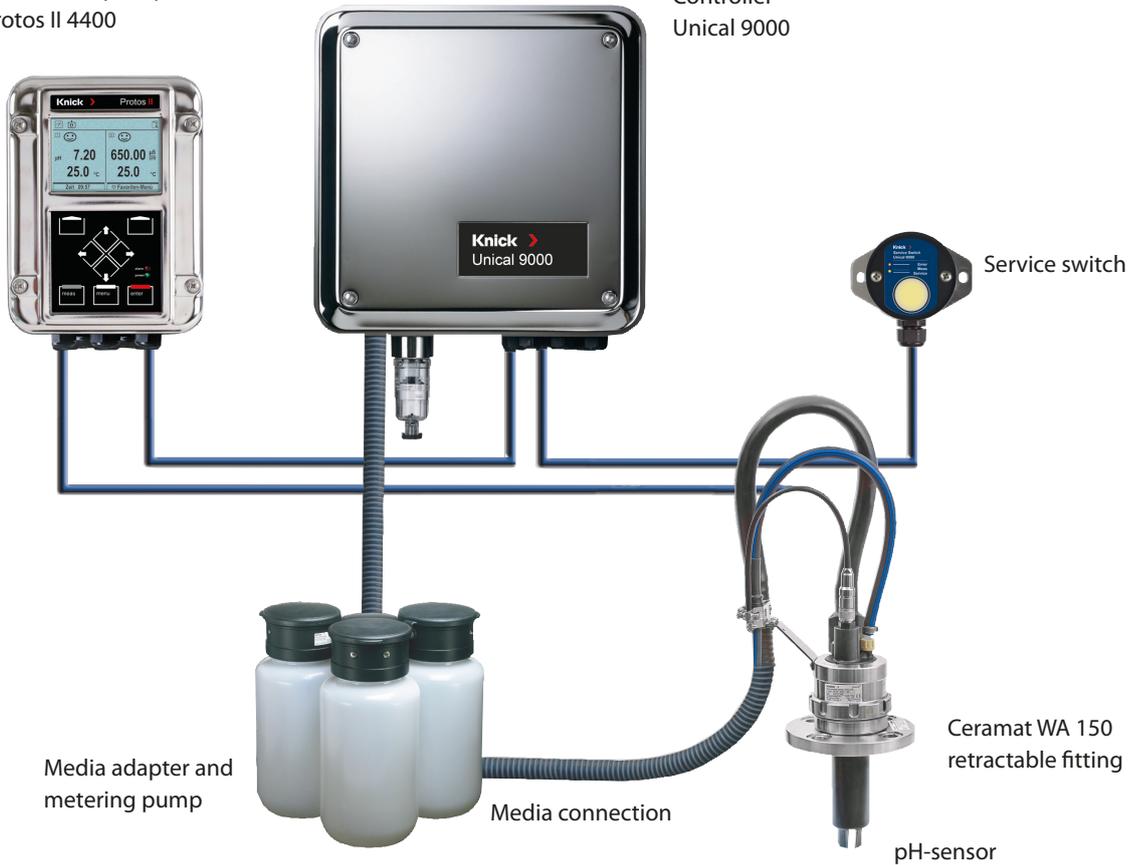


Unical 9000

Overview - The Complete System

Process analysis system
Protos II 4400

Controller
Unical 9000



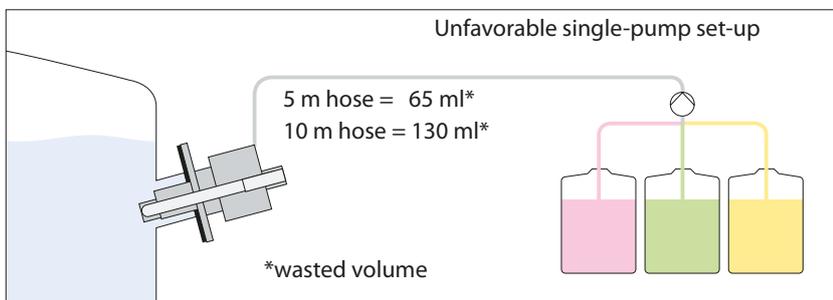
Media adapter and
metering pump

Media connection

Ceramat WA 150
retractable fitting

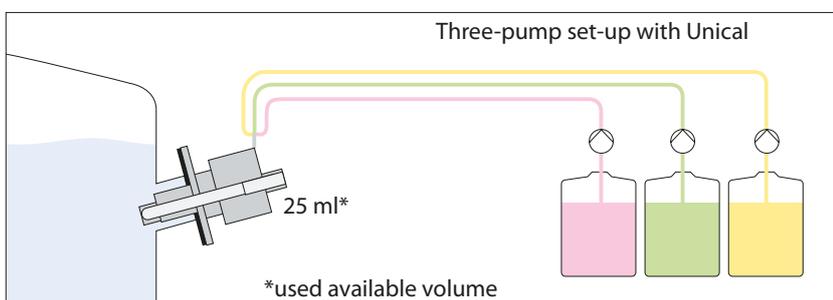
pH-sensor

Safe Pump System with Minimum Buffer Consumption and Minimum Entrainment



Entrainment
through 5–10 m hose

Waste of complete
hose volume



Separate hoses – no entrainment
= max. accuracy!

Minimum buffer consumption
(only 25 ml / cycle)

Specifications

| | | | |
|---------------------|---|--|--|
| Compressed air | Compressed air quality to ISO 8573-1:2001 | Quality class 5.3.3 | |
| | Solid contaminants | Class 5 (max. 40 µm, max. 10 mg/m ³) | |
| | Water content | for temperatures ≥ 15 °C | Class 4 With operating temperatures > 15 °C a pressure dew point of max 3 °C is permitted |
| | | for temperatures 5 ... 15 °C | Class 3 Pressure dew point –20 °C (or below) |
| | Oil content | Class 3 (max. 1 mg/m ³) | |
| | Permitted pressure range | 4 ... 10 bar | |
| | Operating pressure for retractable fittings | 4 ... 7 bar | |
| | Pressure monitoring | Automatic monitoring, message | |
| | Connection | G ¼" female thread | |
| | Air consumption | Max. 300 L/min during probe movement | |
| | Min. air temperature | 5 °C | |
| | Rinse water | Filtered 100 µm | |
| | | Permitted pressure range | 2 ... 6 bar |
| | | Temperature range | 5 ... 65 °C |
| Pressure monitoring | | Automatic monitoring, message | |
| Connection | | G ¼" female thread / G ¾" male thread | |
| Media adapter | Three ports for metering pump | | |
| | Port I and II | Calibration buffer | |
| | Port III | Cleaning agent | |
| | Material | PP, PE, EPDM, (optional FKM) | |
| | Ingress protection | IP 65 | |
| | Mounting | Wall or pipe mounting (Option) | |
| | Weight | approx. 2 kg | |
| Metering pump | For buffer solution or cleaner | | |
| | Bottle | 3.5 L | |
| | Max. lifting height | 10 m | |
| | Displaced volume | Approx. 25 cm ³ /stroke | |
| | Level monitoring | Unical network diagram as well as NAMUR messages: Maintenance request and failure | |
| | Material | PP, PE, EPDM (opt. FKM), check valves: glass, HC4 | |
| | Ingress protection | IP 65 | |
| | Dimensions | 150 x 150 x 340 mm with 3.5-L bottle | |
| | Weight | approx. 1.5 kg (with empty 3.5-L bottle) | |

Unical 9000

Specifications

| | | |
|--|---|---|
| Service switch | Safety switch for service work on Unical or retractable fitting, in two variants: stainless steel and plastic | |
| | Signaling | Yellow LED "flashes" Retractable fitting in process |
| | | Yellow LED on "Service" position reached |
| | | Red LED on "Service" position not reached |
| | Material | Stainless steel A4, polished or POM |
| | Ingress protection | IP 65 |
| | Mounting | Wall or pipe mounting |
| Dimensions | 90 x 65 x 43 mm | |
| Power | Supplied via Protos module PHU 3400(X)-110 or external power supply source | 6.8 V (± 10 %) / 15 mA 15 ... 30 V / 20 mA |
| | Connection | Terminals, conductor cross section max 2.5 mm ² (preassembled connecting cable to Protos, length 10 m) |
| | RS 485 | communication with Protos module PHU 3400(X)-110 or external host computer (e.g. DCS) |
| RS 485 | Transmission | 1200 bauds / 8 data bits / 1 stop bit / parity odd |
| | Protocol | HART Rev. 5 |
| | Connection | Terminals, conductor cross section max 2.5 mm ² (preassembled connecting cable to Protos, length 10 m) |
| DCS input (passive) Measuring / Service | Measuring / Service | |
| | Switching voltage | 0 ... 2 V AC/DC inactive (measuring) |
| | | 10 ... 30 V AC/DC active (service) |
| Connection | terminals, conductor cross section max. 2.5 mm ² | |
| DCS input (passive) Auto / Manual | Automatic function blocked | |
| | Switching voltage | 0 ... 2 V AC/DC inactive (automatic intervals enabled) |
| | | 10 ... 30 V AC/DC active (automatic intervals blocked) |
| Connection | terminals, conductor cross section max. 2.5 mm ² | |
| DCS inputs (passive) Bin1 ... 3 | Program start 1 ... 6 | |
| | Switching voltage | 0 ... 2 V AC/DC inactive |
| | | 10 ... 30 V AC/DC active |
| Connection | terminals, conductor cross section max. 2.5 mm ² | |

Specifications

DCS outputs (passive)
(Program runs, Service,
Measuring/Alarm)

check-back signals Service, measuring, program electronic relay contacts,
floating, inter-connected

Voltage drop < 1,2 V

Connection terminals, conductor cross section max. 2.5 mm²

Explosion protection

See EU Type Examination Certificate and EU Declaration of Conformity
or www.knick.de

EMC

EN 61326

Lightning protection

EN 61000-4-5 Installation Class 2

Protection against electric shock

according to EN 61010

Ambient conditions

Ambient temperature +2 ... +55 °C (Ex: +2 ... +50 °C)
(different temperature range on request)

Transport/Storage
temperature -20 ... +70 °C

Relative humidity 10 ... 95 %, not condensing

Housing Unical 9000 S Stainless steel A2, polished
Unical 9000 C Stainless steel A2, coated

Mounting Wall mounting Pipe mounting (Option)

Dimensions W x H x D approx.
320 x 400 x 120 mm

Ingress protection IP 65/NEMA 4X

Cable glands 6 cable glands M20 x 1.5
knockouts for NPT 1/2" or Rigid Metallic Conduit

Weight approx. 8.5 kg

Unical 9000

Product Range

| Basic Unit | Unical | 9000 | - | | | | | | | | | | | | | | | | | |
|---|--|------|---|---|---|---|--|--|--|--|--|--|---|---|---|---|---|--|--|--|
| Approvals | ATEX/IECEX/CSA Zone 1/ FM CI 1 Div 1 | X | | | | | | | | | | | | | | | | | | |
| | Without | N | | | | | | | | | | | | | | | | | | |
| Housing | Steel, coated | C | | | | | | | | | | | | | | | | | | |
| | Stainless steel, polished | S | | | | | | | | | | | | | | | | | | |
| Media connection (rinse function only) | 5 m (gasket material: FKM) | 1 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| | 10 m (gasket material: FKM) | 2 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| | 15 m (gasket material: FKM) | 5 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| | 5 m (gasket material: EPDM) | A | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| | 10 m (gasket material: EPDM) | B | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| | 15 m (gasket material: EPDM) | E | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| Media connection (calibration and rinse function) | 5 m (gasket material: FKM) | 3 | | | | | | | | | | | | | | | | | | |
| | 10 m (gasket material: FKM) | 4 | | | | | | | | | | | | | | | | | | |
| | 14 m (gasket material: FKM) | 7 | | | | | | | | | | | | | | | | | | |
| | 17 m (gasket material: FKM) | 6 | | | | | | | | | | | | | | | | | | |
| | 5 m (gasket material: EPDM) | C | | | | | | | | | | | | | | | | | | |
| | 10 m (gasket material: EPDM) | D | | | | | | | | | | | | | | | | | | |
| | 14 m (gasket material: EPDM) | G | | | | | | | | | | | | | | | | | | |
| | 17 m (gasket material: EPDM) | F | | | | | | | | | | | | | | | | | | |
| Media interface | With (for standard probes) | 1 | | | | | | | | | | | | | | | | | | |
| | Without (for WA 130, 150, 154, 160) | 0 | | | | | | | | | | | | | | | | | | |
| Media adapter with port I - III | With (gasket material: FKM) | 1 | | | | | | | | | | | | | | | | | | |
| | With (gasket material: EPDM) | A | | | | | | | | | | | | | | | | | | |
| | Without | 0 | | | | | | | | | | | | | | | | | | |
| Port I | Metering pump with empty 3.5-L bottle (EPDM) | 2 | | | | | | | | | | | | | | | | | | |
| | Without | 0 | | | | | | | | | | | | | | | | | | |
| Port II | Metering pump with empty 3.5-L bottle (EPDM) | 2 | | | | | | | | | | | | | | | | | | |
| | Without | 0 | | | | | | | | | | | | | | | | | | |
| Port III | Metering pump with empty 3.5-L bottle (EPDM) | 2 | | | | | | | | | | | | | | | | | | |
| | Metering pump with empty 3.5-L bottle (FKM) | B | | | | | | | | | | | | | | | | | | |
| | Without | 0 | | | | | | | | | | | | | | | | | | |
| Supplementary air purging kit | With | | | | | | | | | | | | C | | | | | | | |
| | Without | | | | | | | | | | | | N | | | | | | | |
| Supplementary ext. valve kit | With | | | | | | | | | | | | | E | | | | | | |
| | Without | | | | | | | | | | | | | N | | | | | | |
| Special variant | Without | | | | | | | | | | | | | | 0 | 0 | 0 | | | |
| | With protective cabinet, non-Ex | | | | | | | | | | | | | | 1 | 0 | 0 | | | |
| | With protective cabinet and heater, non-Ex | | | | | | | | | | | | | | 2 | 0 | 0 | | | |
| | With protective cabinet, Ex | | | | | | | | | | | | | | 3 | 0 | 0 | | | |
| | With protective cabinet and heater, Ex | | | | | | | | | | | | | | 4 | 0 | 0 | | | |

Accessories**Accessories**

| | Order No. |
|---|-----------|
| Pipe mount kit for Unical 9000 | ZU 0601 |
| Pipe-mount kit for media adapter | ZU 0606 |
| Connection kit for Unical 9000 (water and air) | ZU 0656 |
| Commissioning Unical 9000 | ZU 0649 |
| Chemical pump (Aux 2 / ZU 0588 ext. valve kit required) | ZU 0741 |

Spare Parts**Spare Parts + Retrofit Parts for Uniclean 900**

| | Order No. |
|--|-------------|
| Media connection, rinse, 5 m (FKM gaskets) | ZU 0572/1 |
| Media connection, rinse 5 m (EPDM gaskets) | ZU 0572/2 |
| Media connection, rinse, 10 m (FKM gaskets) | ZU 0573/1 |
| Media connection, rinse 10 m (EPDM gaskets) | ZU 0573/2 |
| Media connection, rinse, 15 m (FKM gaskets) | ZU 0652/1 |
| Media connection, rinse 15 m (EPDM gaskets) | ZU 0652/2 |
| Media connection, rinse + clean, 5 m (FKM gaskets) | ZU 0574/1 |
| Media connection, rinse + clean, 5 m (EPDM gaskets) | ZU 0574/2 |
| Media connection, rinse + clean, 10 m (FKM gaskets) | ZU 0575/1 |
| Media connection, rinse + clean, 10 m (EPDM gaskets) | ZU 0575/2 |
| Media connection, rinse + clean, 14 m (FKM gaskets) | ZU 0932/1 |
| Media connection, rinse + clean, 14 m (EPDM gaskets) | ZU 0932/2 |
| Media connection, rinse + clean, 17 m (FKM gaskets) | ZU 0653/1 |
| Media connection, rinse + clean, 17 m (EPDM gaskets) | ZU 0653/2 |
| Media interface for standard probes | ZU 0576 |
| Metering pump (PP, FKM) with empty 3.5 L bottle | ZU 0580/1 |
| Metering pump (PP, EPDM) with empty 3.5 L bottle | ZU 0580/2 |
| Metering pump (PP, FKM) with empty 3.5 L bottle, Ex | ZU 0580 X/1 |
| Metering pump (PP, EPDM) with empty 3.5 L bottle, Ex | ZU 0580 X/2 |
| Supplementary air purging kit | ZU 0587 |
| Supplementary Aux2 kit | ZU 0588 |
| Media adapter (FKM gaskets) | ZU 0715/1 |
| Media adapter (EPDM gaskets) | ZU 0715/2 |
| Media adapter, Ex (FKM gaskets) | ZU 0715 X/1 |
| Media adapter, Ex (EPDM gaskets) | ZU 0715 X/2 |
| Pressure gauge replacement kit (water pressure indication) | ZU 0984 |

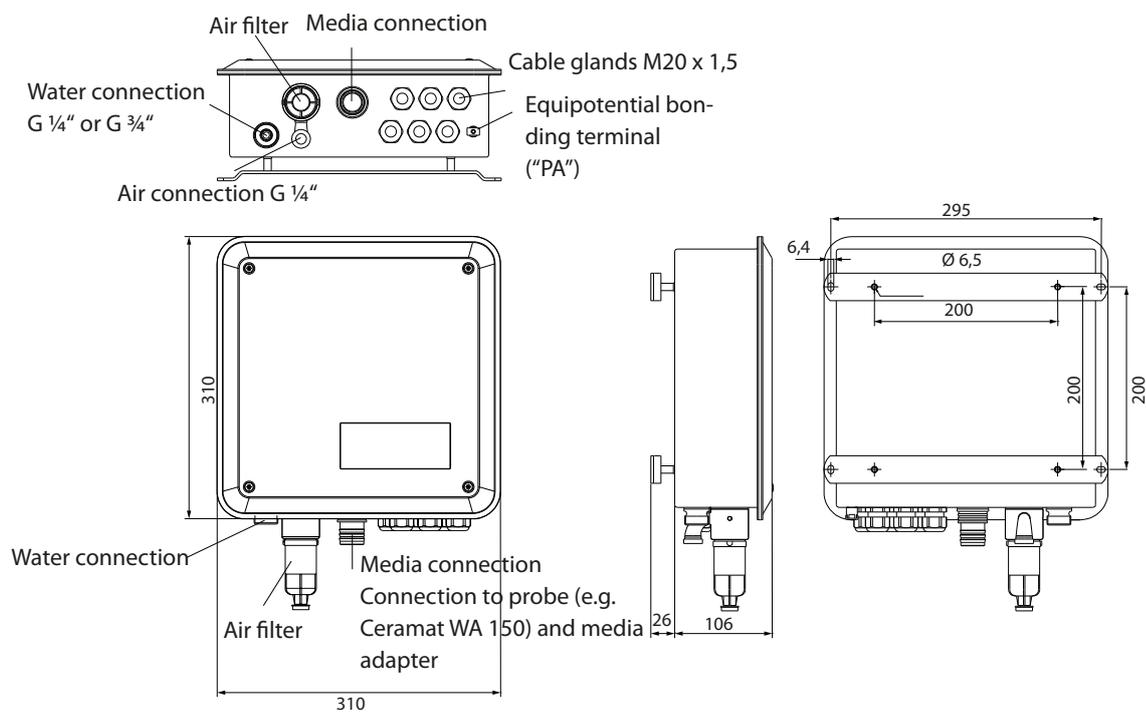
Unical 9000

Service Parts

| Service Parts for Unical 9000 | Order No. |
|---|------------------|
| Air pressure switch | ZU 0632 |
| Water pressure switch | ZU 0633 |
| Probe valve, complete | ZU 0634 |
| Water valve | ZU 0714 |
| Sensor dismount guard, complete | ZU 0644 |
| Air purge valve, complete | ZU 0636 |
| Aux 2 valve, complete | ZU 0637 |
| Piezo valve for valve block | ZU 0638 |
| Gasket for port at media adapter (EPDM) | ZU 0639 |
| Filter insert (5 ... 10 µm) | ZU 0640 |
| Replacement filter housing | ZU 0641 |
| Electronics module, tested, encapsulated | ZU 0642 |
| Electronics module, tested, encapsulated, Ex | ZU 0642 X |
| Small parts kit | ZU 0643 |
| Multiplug service set, FKM gaskets | ZU 0812/A |
| Multiplug service set, EPDM gaskets | ZU 0812/B |
| Reed switch, short (service part for multiplug) | ZU 0813/1 |

Dimension Drawings

Wall Mounting

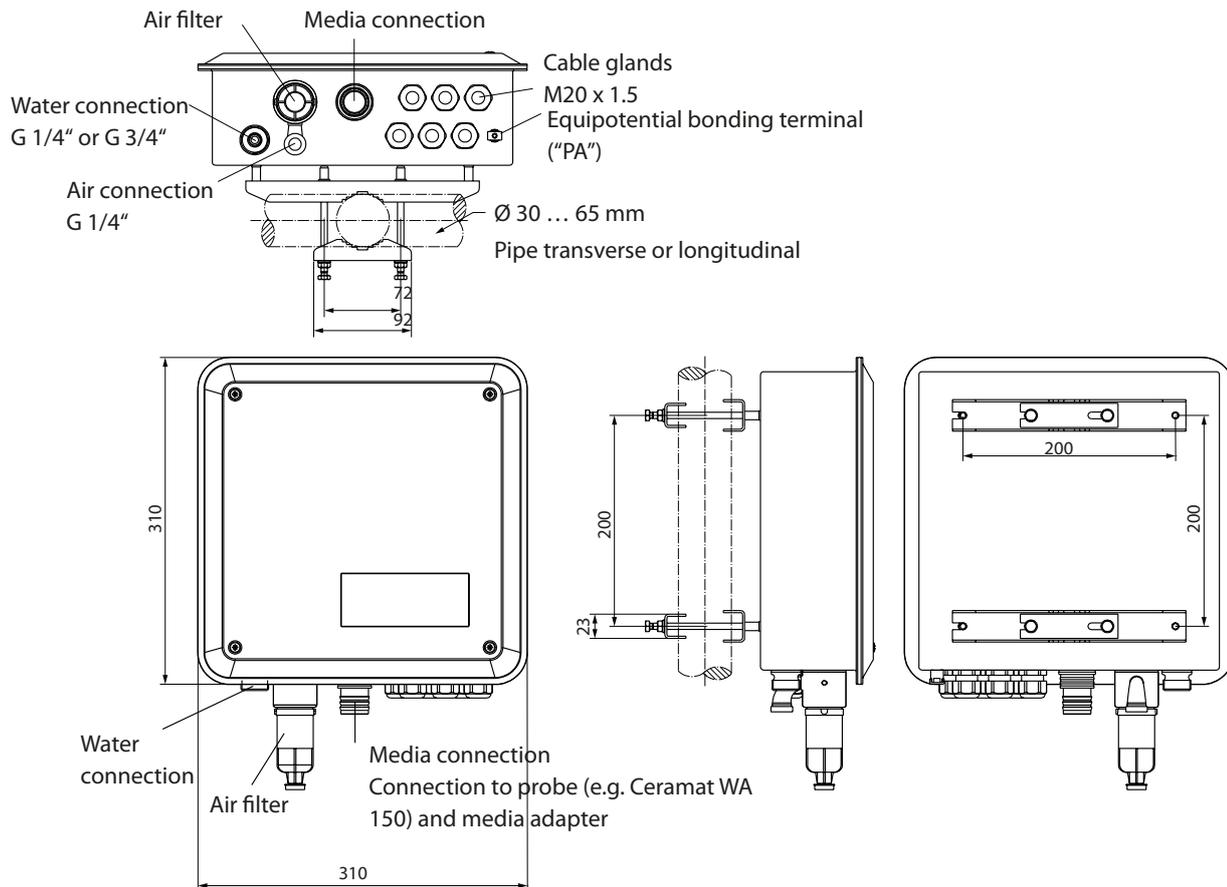


All dimensions in mm.

Unical 9000

Dimension Drawings

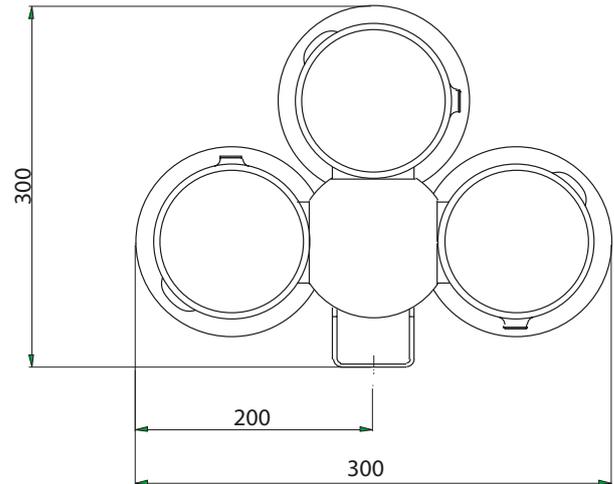
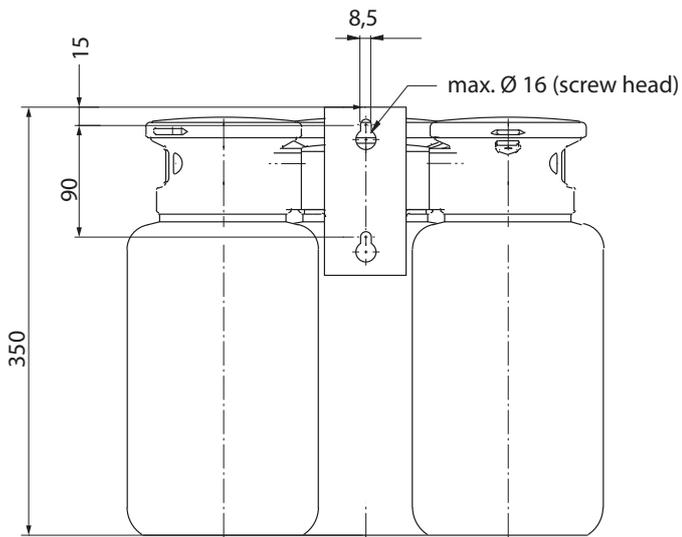
Pipe mounting



All dimensions in mm.

Dimension Drawings

Media adapter



All dimensions in mm.

Unical 9000

Terminal Assignments

| | | | | | | | | | | | | | | | | | | | | | |
|--------|---------|-----|-------------|-----|-------------|-----|-------|-----|-------|-----|--------|------------|----------------------|---------------|-----|-------------|-----|-----------------|-----|------------------|--|
| Valves | | | | | | | | | | | | Monitoring | | | | | | | | | |
| GND | Reserve | GND | Auxiliary 2 | GND | Auxiliary 1 | GND | Water | GND | Probe | GND | Safety | GND | Sense pressure (air) | Sense reserve | GND | Sense water | GND | Sense electrode | GND | Sense water stop | |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | |

| | | | | | | | | | | | | | | | | | | | | |
|--|----------------|----------|-----------|----------------|----------------|-------------------|-------|----------------|-------------|-------------------|----------------|----------------|-----------|----------|----------|--------|-------|----------------|-------|------|
| Output to DCS | | | | Input from DCS | | | | | | | | Metering pumps | | | | | | | | |
| GND | Program runs | Service | Measuring | Do not connect | GND | Program selection | | | Auto/manual | Measuring/service | Do not connect | GND | I Level | III Pump | II Level | I Pump | Level | Pump | Level | Pump |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
|  Knick > Unical® 9000  | | | | | | | | | | | | | | | | | | | | |
| User specific | | Feedback | | | Service switch | | | Probe position | | Power off | | Protos/M700 | | | | | | | | |
| | Do not connect | GND | Sense B | GND | Sense A | GND | LED 1 | LED 2 | Switch | GND | Service | Meas | Power off | RS 485 A | RS 485 B | GND | Power | External power | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |