



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

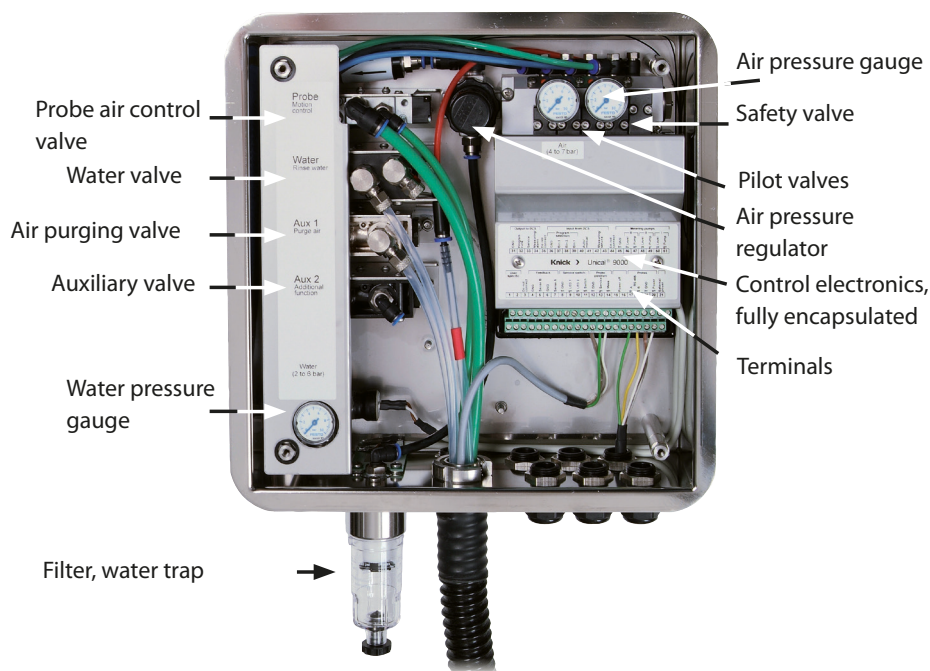
Low-wear and low-maintenance pump with extremely low consumption of buffer.

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



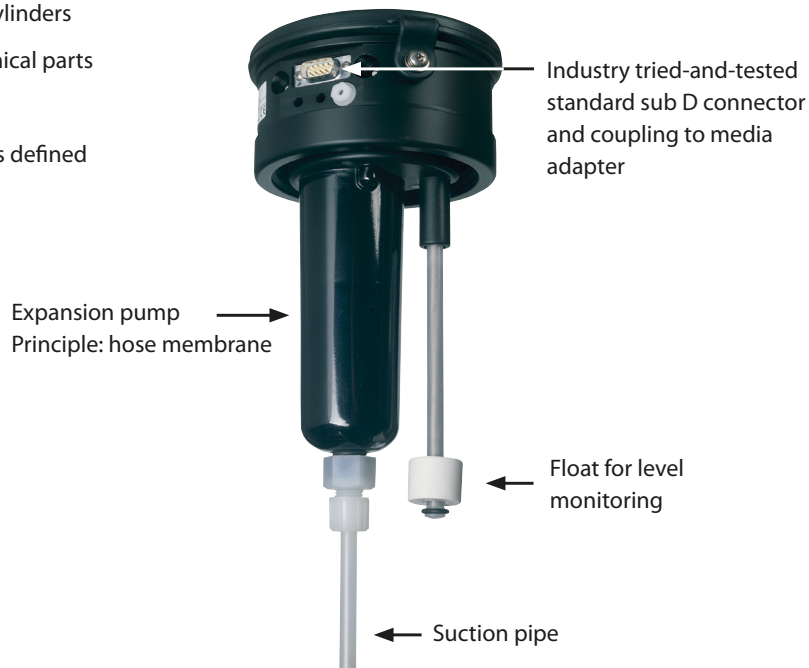
The valve units are expandable.

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

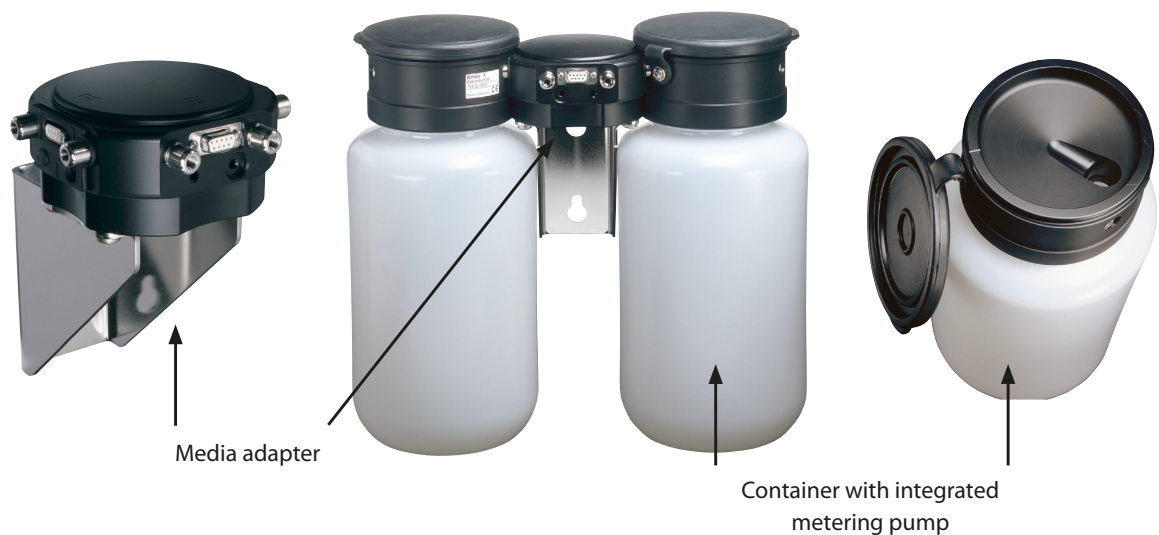
New, Innovative Pump Design for Low Maintenance Costs

- 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.

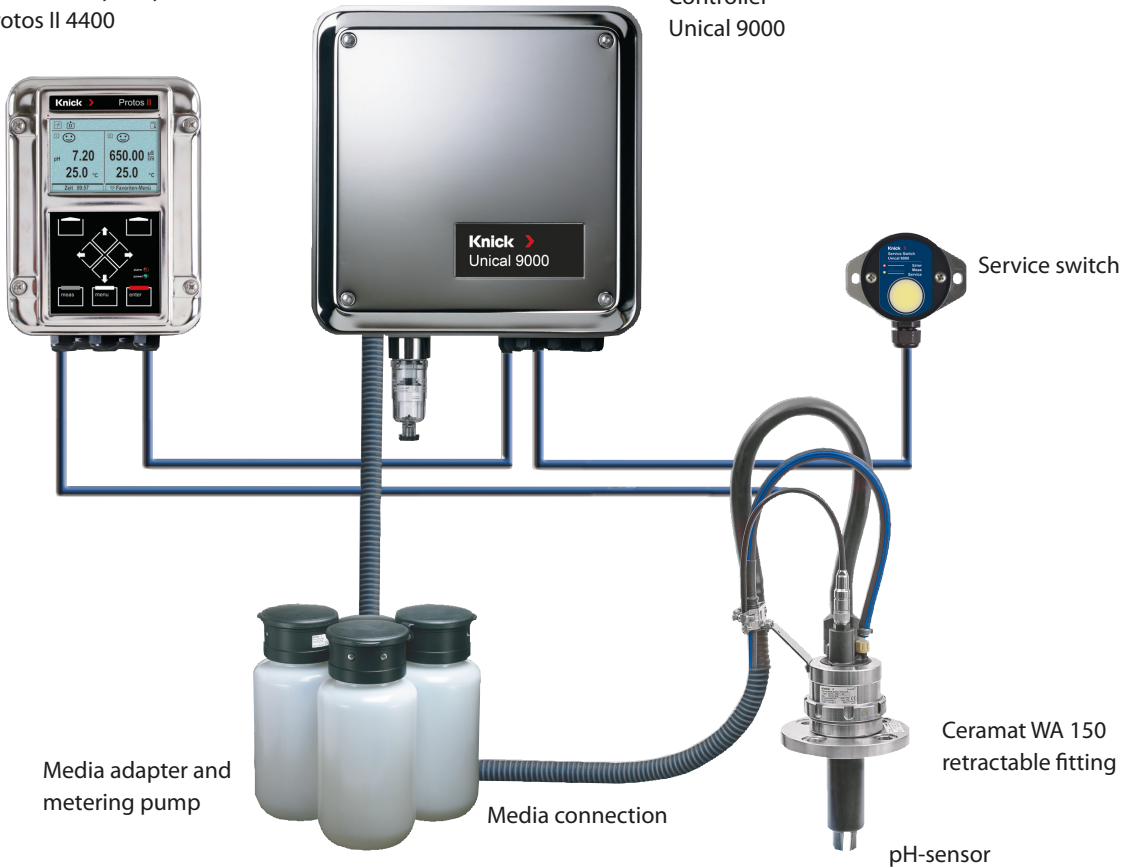


Unical 9000

Overview - The Complete System

Process analysis system
Protos II 4400

Controller
Unical 9000



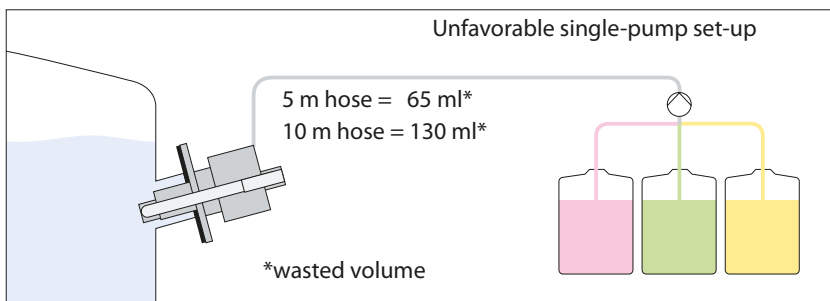
Media adapter and
metering pump

Media connection

Ceramat WA 150
retractable fitting

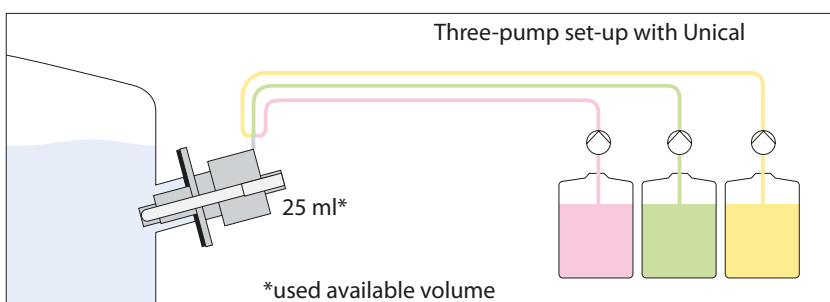
pH-sensor

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	6.8 V (± 10 %) / 15 mA
	or external power supply source	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)	
	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

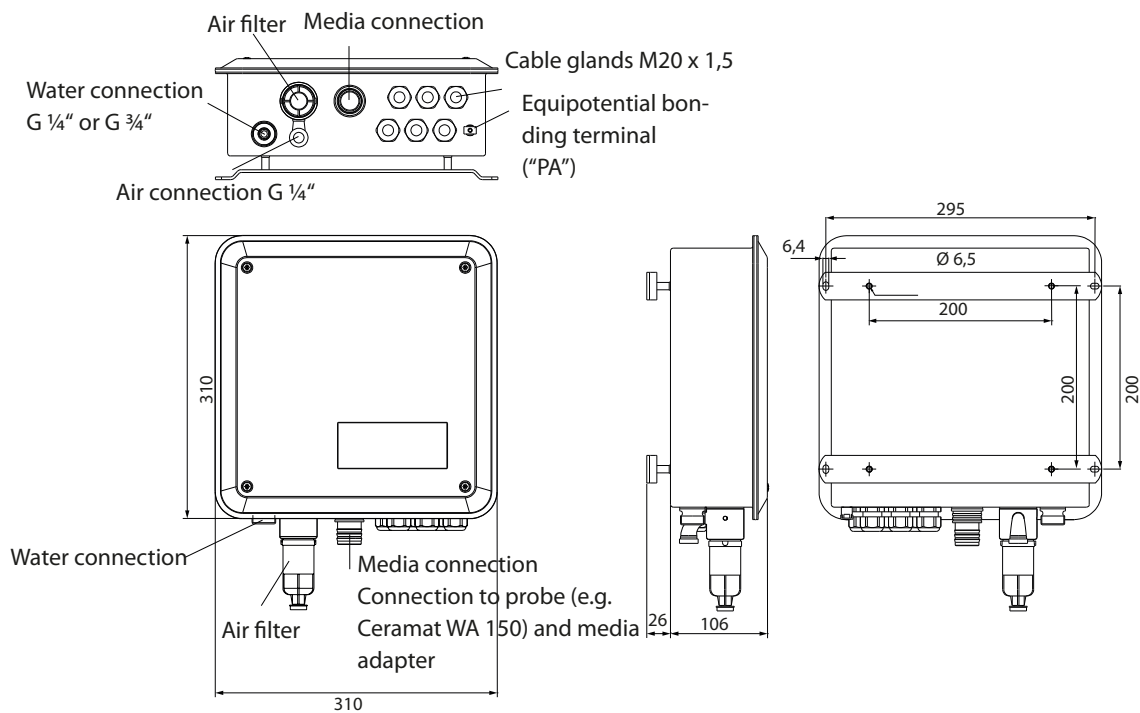
Unical 9000

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

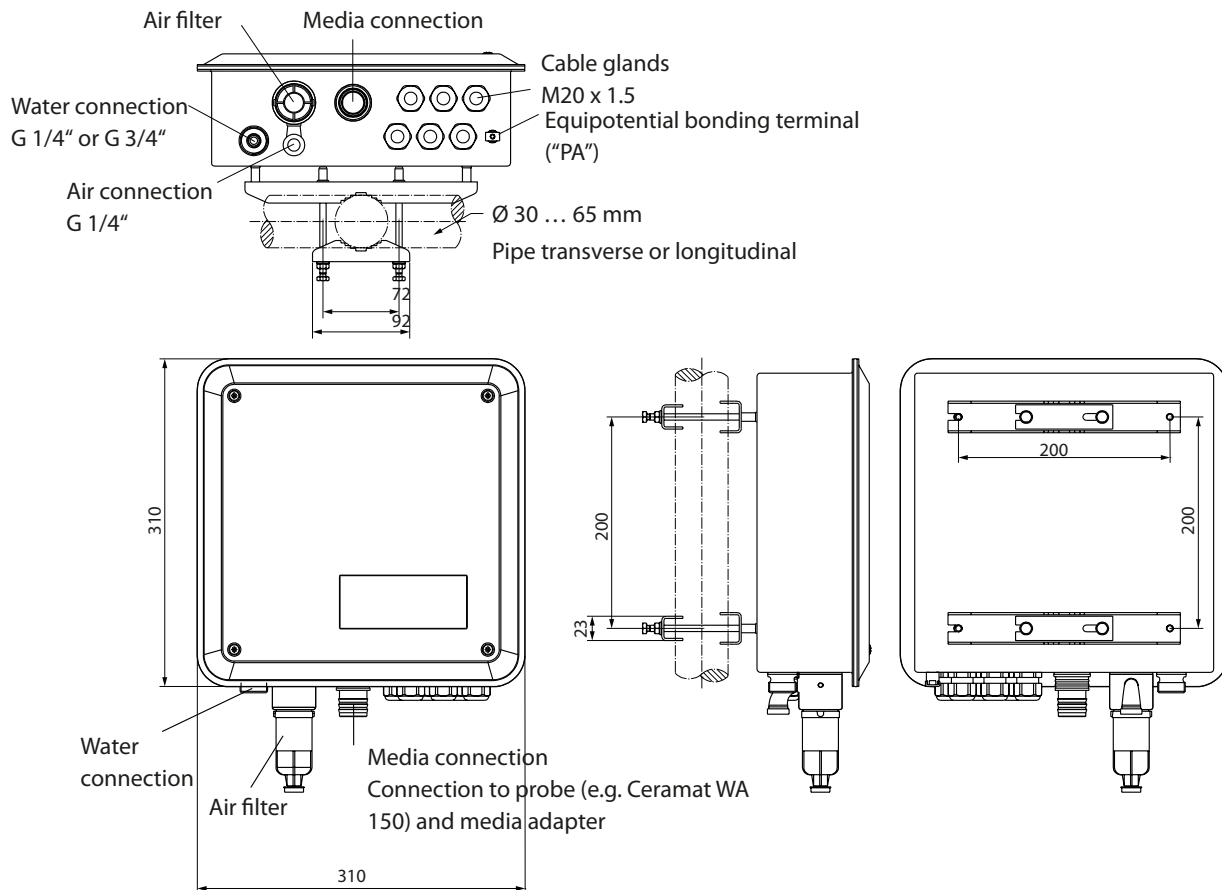


All dimensions in mm.

Unical 9000

Dimension Drawings

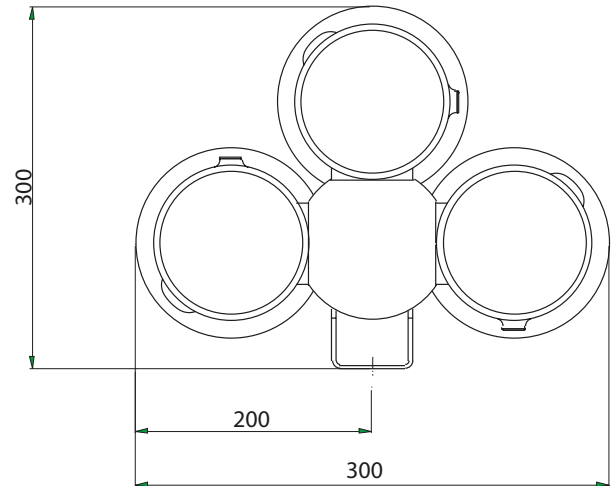
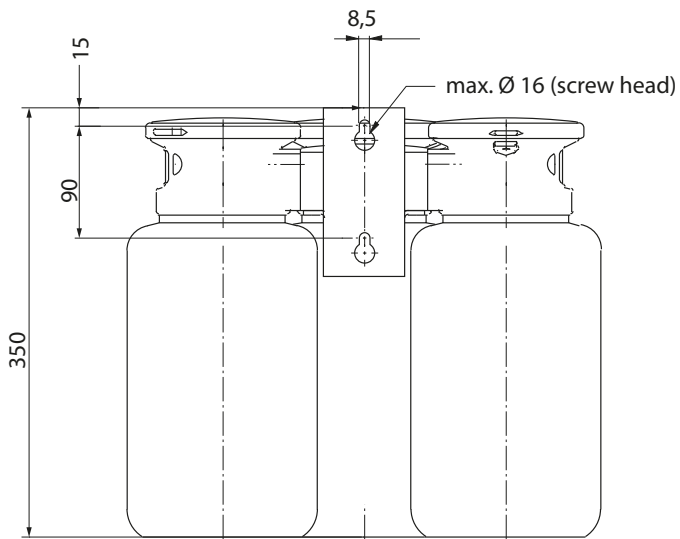
Pipe mounting



All dimensions in mm.

Dimension Drawings

Media adapter





All dimensions in mm.

Unical 9000

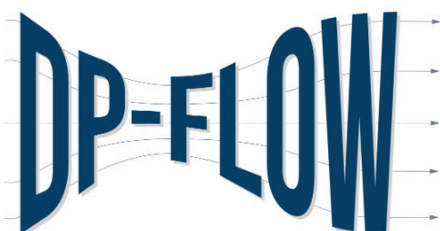
Terminal Assignments

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	Level III	Pump whpk	Level II	Pump gpk	Level I	Pump ypk	Level	Pump gpk
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



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