Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

Liquiport 2000

Automatic sampler for liquid media

Application

Municipal and industrial sewage treatment plants:
- Self-monitoring
- Process monitoring
- Monitoring of indirect dischargers
- Manhole monitoring

Authorities and Water Conservancy Boards:
- Water protection and water quality
- Monitoring of indirect/direct dischargers
- Labs and hydrological institutes
- Sampling of liquid media

Your benefits

Simple and user-friendly:
- Menu-guided operation with "Quick-Setup" for rapid commissioning
- Parts conveying media can be mounted easily and without tools, for easy cleaning and maintenance
- Sampler compartment can be sealed and carried separately, for easy and safe sample transportation

Communicative:
- Integrated data logger for recording measured values and sample statistics
- RS232 interface for configuring and for data transmission
- Multi-parameter probes can be connected (optional)

Safe:
- Lockable sample base prevents sample manipulation
- ATEX II2G certification (optional) for safe operation in Ex areas, Zone 1

TI084R/09/en
No. 51002728

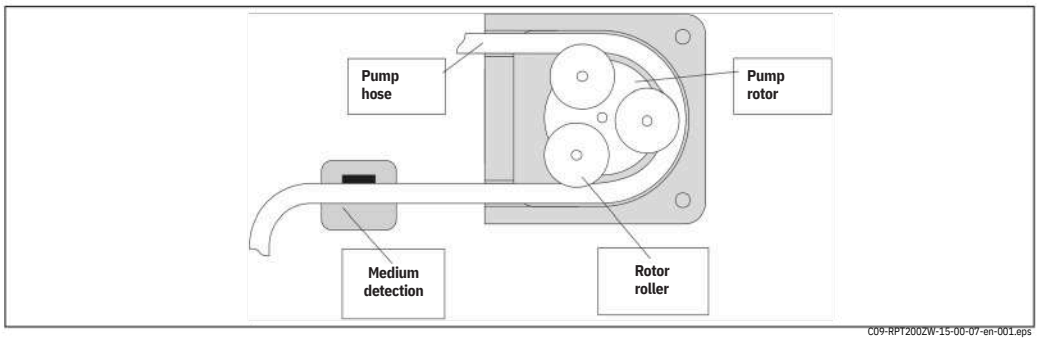
Endress+Hauser
People for Process Automation

Function and system design

Measuring principle

The Liquiport 2000 is a portable sampler for fully automated sampling and distribution of liquid media.

Sampling principle



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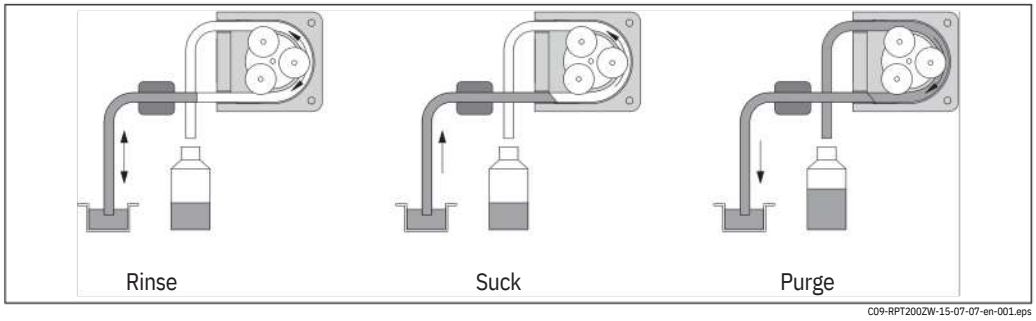
The functional principle of the peristaltic pump involves squeezing a flexible pump hose at one or several points and moving the squeezed point in the desired direction of fluid delivery. Moving the squeezed point is implemented by a pump rotor with rotor rollers on its circumference. The medium detection system controls the electronic volume calculation.
The medium detection system is a new system developed by Endress+Hauser. A pressure sensor is at the heart of the system. The pressure sensor detects the difference between a full and empty pump tube.

The advantages of the Endress+Hauser system:

•Intelligent: the suction height is automatically detected and does not have to be configured
•Maintenance-free: ceramic membrane

Sampling takes place in three steps:



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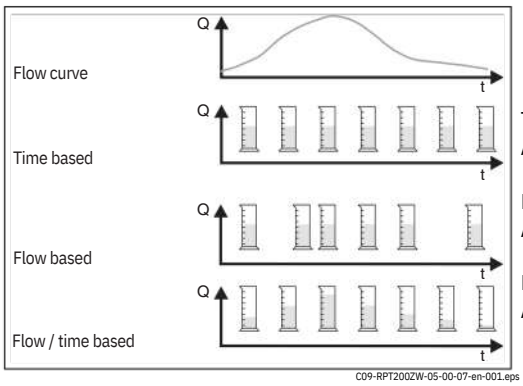
Rinsing the suction line: the sampling liquid is sucked in until the medium detection system is triggered. Then the pump runs backwards and pushes the liquid back to the sampling point. The rinsing process can be repeated up to three times.
Sucking the sampling liquid: the sampling liquid is sucked from the sampling point to the sampler and the sample volume is calculated electronically.
Emptying the suction line: after sampling, the liquid left over in the suction line is pumped back to the sampling point.

Sampling methods

The timer function in the control system makes sampling at defined times possible.

Depending on the measured flow, samples can be taken in proportion with the quantity or flow.
Sampling can also be triggered by an external signal, for event pacing at alarm values.



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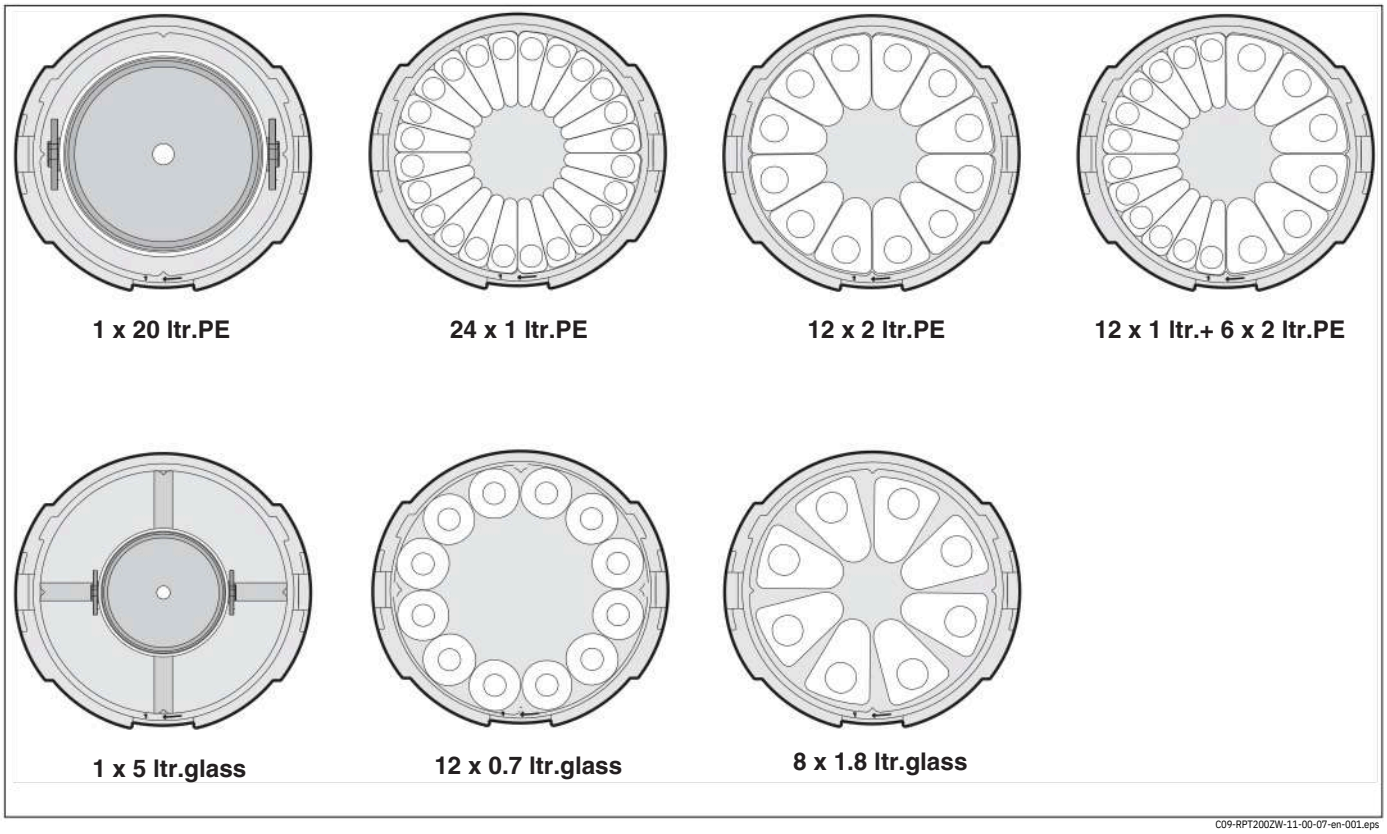
Time based:
A constant sample volume is taken at constant time intervals.

Flow based:
A constant sample volume is taken at variable time intervals.

Flow / time based:
A variable sample volume is taken at the same time intervals.

Sample distribution	The sampling liquid is distributed into the individual bottles by using a rotating distributing arm. In addition to a 20 litre PE composite container, various bottle configurations are available: The distribution version can be changed easily without the need of tools. The Liquiport 2000 allows flexible configuration of the sample distribution. Individual bottles and bottle groups can be free defined for the main, switching and event programmes.
Sample preservation	The sample bottles are located in the lower compartment of the sampler. They can be cooled with crushed ice. The bottle base can be sealed with a cover and transported separately from the upper sampler section.



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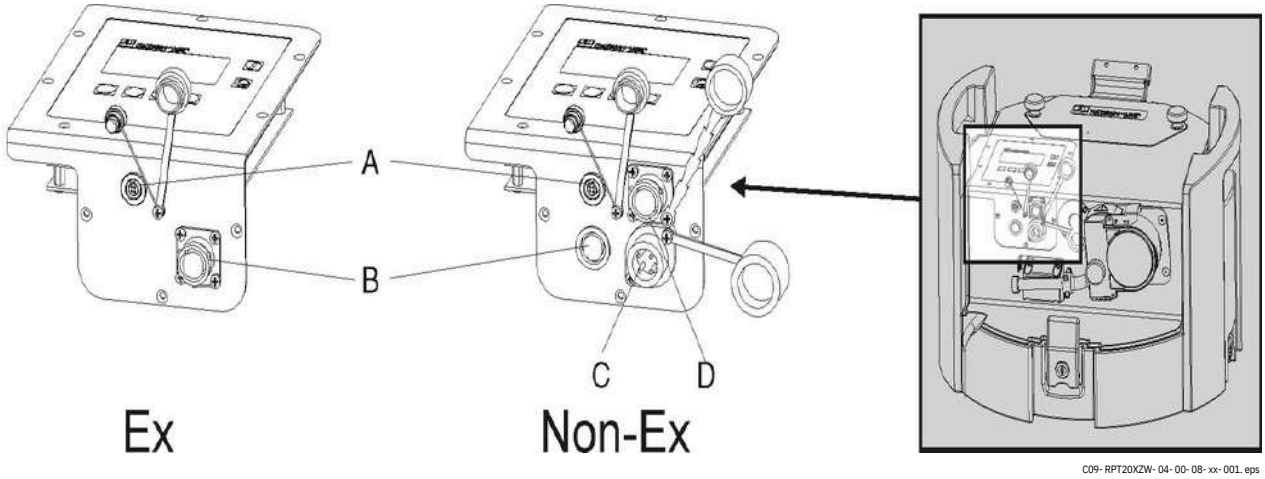
Dosing

Sample volume	20 to 9999 ml, programmable in ml increments
Dosing accuracy	± 5 ml or ± 5 % of the set volume
Intake velocity	> 0.5 m/s, to EN 25667

Suction lift	6 metres; 8 metres (optional)
Intake lenght	30 metres

Inputs and outputs



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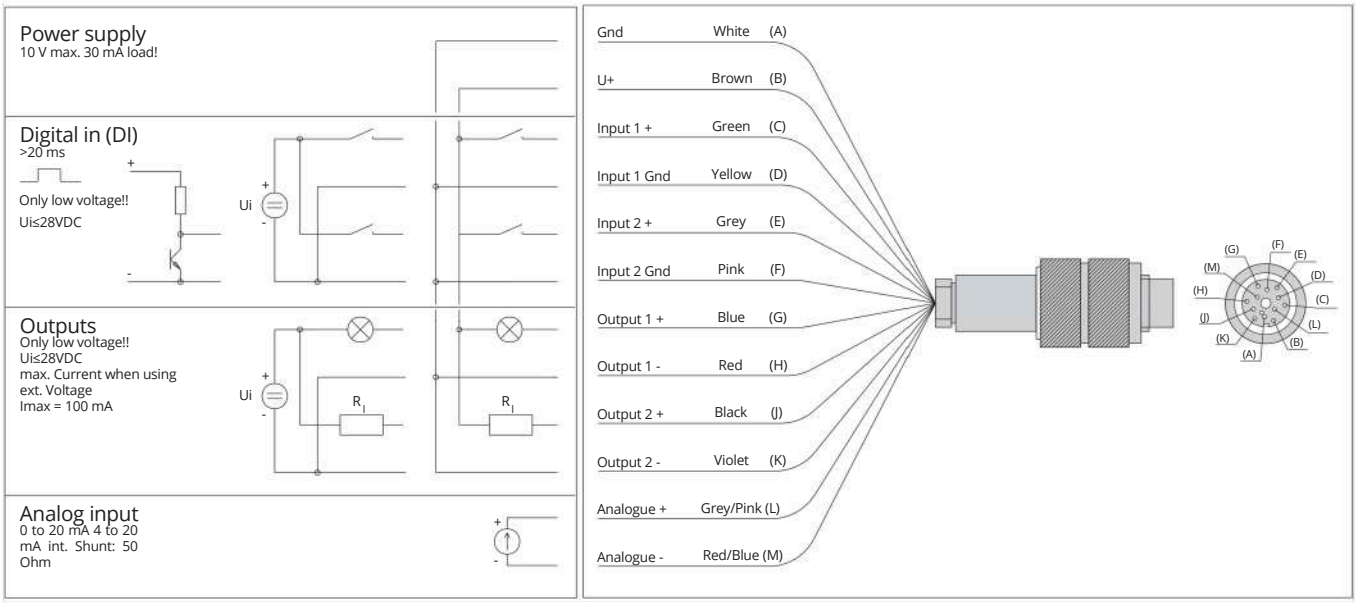
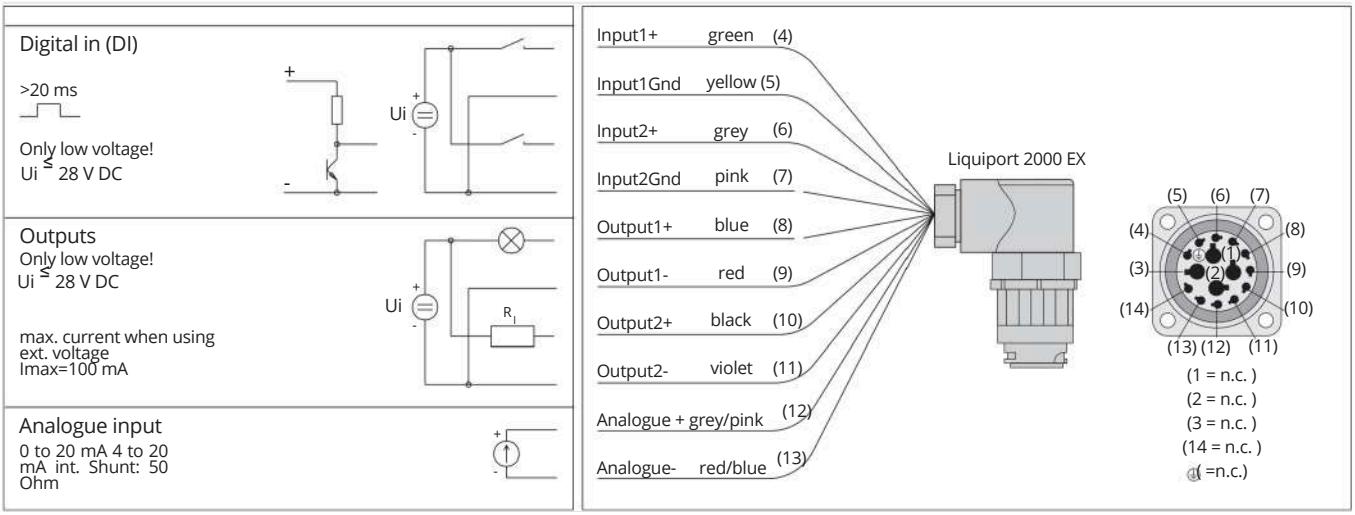
Electrical connections of the device
–A = Connection socket for the digital interface RS232
–B = Connection socket for the signal cable
–C = Connection socket for the charger (not on Liquiport 2000 Ex)
–D = Optional: Connection socket for the multi-parameter probe (not on Liquiport 2000 Ex)

Signal cable connection, Liquiport 2000 (item B):



Signal cable connection, Liquiport 2000 Ex (item B):



Multi-parameter probe connection (optional for standard sampler; item D):
As an added option, the Liquiport 2000 has an additional connection socket for a multi-parameter probe. The following multi-parameter probes can be connected to this connection socket:
•Multi-parameter probe "MultiSens C600" from Endress+Hauser
•YSI 600R, YSI 600 XL, YSI 600 XLM, YSI 6920, YSI 6820, YSI 6600

! Note!
All explosion protection data are given in a separate documentation which is available upon request (see "Documentation").

Power supply

Supply voltage

Sampler: internal 12 VDC, 12 Ah lead gel battery

! Note!
The sampler cannot be operated without the battery. The battery must be installed before operation.

Charger for Liquiport 2000:

Standard IP20	230 V_{AC}; charge current 2.7 A; only suitable for charging operation
Field-suitable IP65	230 V_{AC}; charge current 3.0 A; also suitable for buffer charging operation
Wide range IP30	110 V_{AC} to 230 V AC; charge current 2.0 A; also suitable for buffer charging operation

! Note!
Buffer charging operation means that the sampler is in operation during the charging process.

Charger for Liquiport 2000 Ex:

Standard IP20	230 V_{AC}; charge current 2.7 A
Wide range IP30	110 V_{AC} to 230 V AC; charge current 2.0 A

! Note!
The unit can only be charged outside Ex-areas. In the case of Liquiport 2000 Ex, you must remove the battery for connecting to the charger.

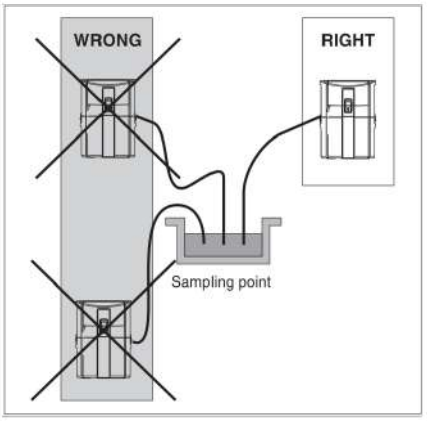
Power consumption

Max. 29 W

Capacity of battery	94 hours (at a sampling interval of 15 minutes, a sampling volume of 100 ml and a suction height of 4 metres) i 376 samples.

Installation conditions

Installation instructions	The suction line must be routed downhill continuously to the sampling source, this helps to drain the line during purges and avoids siphoning!



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Environment

Ambient temperature range	0 °C to +40 °C Do not install the sampler in areas with high temperature and direct sunlight!
Storage temperature	-20 °C to +60 °C
Degree of protection	Sampler: Standard: IP65 Charger: Option: IP20
Electromagnetic compatibility (EMC)	To EN 61 326

Process

Medium temperature range	0 °C to +50 °C
Operating pressure range	No pressure
Sampling media	The sampling media must be free of abrasive substances. Pay particular attention to the material resistances of the device parts conveying media!

Mechanical construction

Design, dimensions

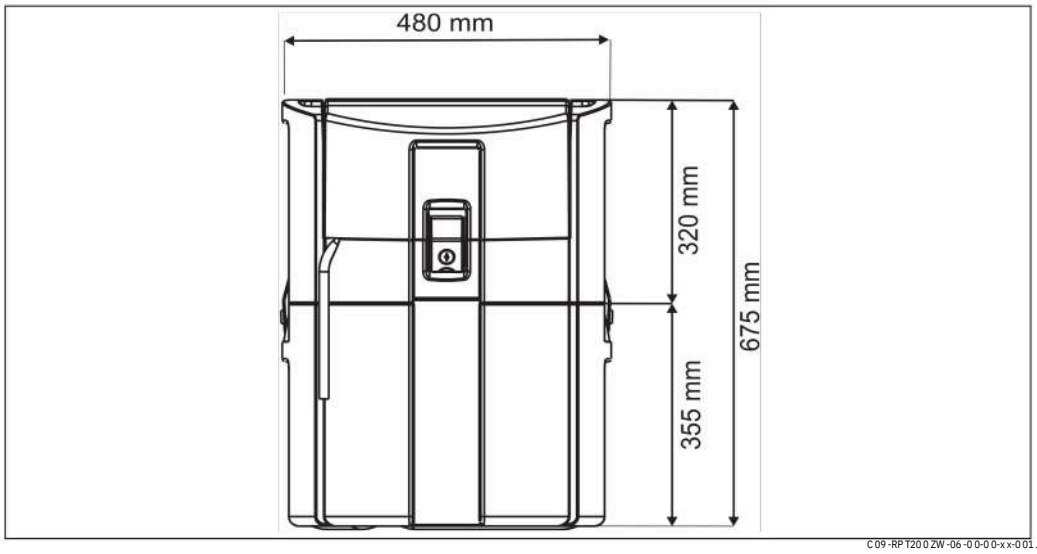


Fig.: Liquiport 2000, Liquiport 2000 Ex

Weight

	Liquiport 2000	Liquiport 2000 ATEX II2G
Empty weight	15 kg	21.5 kg
Overall weight incl. battery, with 24 x 1 l bottles	19 kg	25.5 kg
Upper compartment with battery	10 kg	16.5 kg
Lower compartment with 8 x 1.8 l glass bottles	15.2 kg	15.2 kg
Lower compartment with 24 x 1 l bottles	9 kg	9 kg

Materials

	Liquiport 2000	Liquiport 2000 ATEX II2G
Housing	PE (polyethylene)	PE (polyethylene) with graphite mixture
Housing parts	PE (polyethylene)	PE (polyethylene) with graphite mixture; stainless steel 1.4301 (AISI 304)
Bottles	PE (polyethylene) glass (optional)	PE (polyethylene) glass (optional)
Distributor arm	PE (polyethylene)	PE (polyethylene)
Sensor housing	PP (polypropylene)	PP (polypropylene)
Pump tubing	Silicone	Silicone

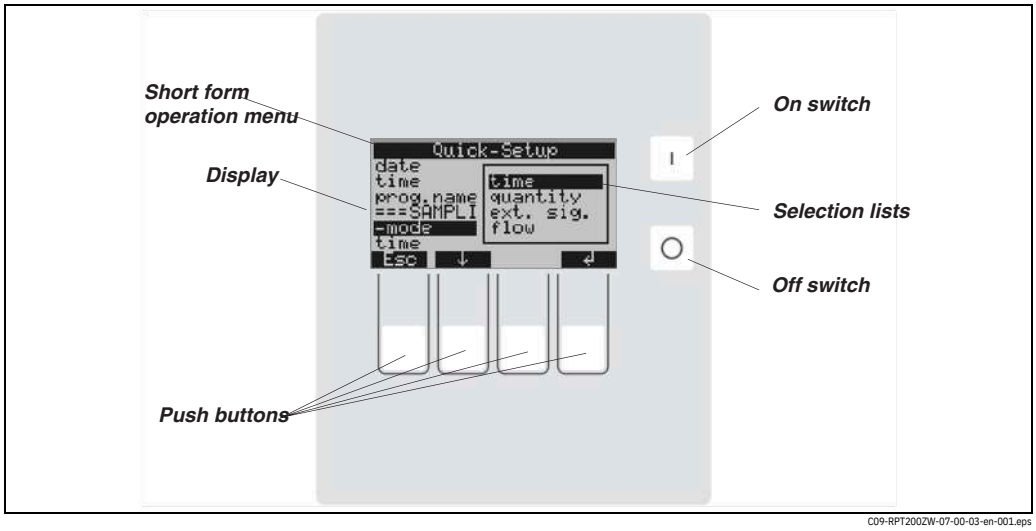
Human interface

Display elements

Liquid crystal display: illuminated (only for Liquiport 2000 Standard), 128X64 dot; 32 characters, 8 lines.

Operating elements

Menu-guided operation using 4 keys on the device. Picklists and short operating menu (“Quick-Setup”) for easy commissioning.



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Remote operation

Interface/PC software ReadWin® 2000

It is especially easy to configure the Liquiport 2000 (and other E+H instruments) with the PC software ReadWin® 2000. Programmes can be created on the PC and transmitted by means of the RS232 interface.

Benefits for the user:

- Uniform user interface at the PC under Windows
- Device settings saved in a database
- Instantaneous value display
- Device settings read out
- Internal memory read out with measured flow rate, sample quantity taken, etc.

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Certificates and approvals

CE-Mark

The sampler system fulfils the requirements demanded by the EU regulations. Endress+Hauser acknowledges successful unit testing by adding the CE mark.

Ex approval

Liquiport 2000 is optionally available with the ATEX II2G EEx dem[ib] IIC T4 certificate for operation in Ex-areas, Zone 1.

Ordering information

Liquiport 2000 portable sampler
Portable, battery-powered sampler with time, flow or event-controlled sampling of liquid media from 20..9999 ml using peristaltic pump. Menu-guided operation with "Quick-Setup", 2 digital inputs/outputs, 1 analog input. External diameter/height 480 mm x 700 mm; empty weight: approx. 19 kg; sampling height: 6 m, max. 8 m, length: max. 30 m, line connection ID 10 mm, supplied accessories: 6 m / 8 m suction line, ID 10 mm

Pos. 010	Control unit
A	1x user mode 7x user mode 7x user mode,
B	Interface Multisens C600R/XL
C	Power supply

Pos. 020	
1	Accumulator 12 V, 12 Ah + charger 230 VAC, IP20, NC=Not for buffer charging operation
2	Accumulator 12 V, 12 Ah, w/o charger
3	Accumulator by customer supplied
4	Accumulator 12 V, 12 Ah + charger 230 VAC, IP65 (adapted for buffer charging operation)
5	Accumulator 12 V, 12 Ah + charger 100...230 VAC, IP30 (adapted for buffer charging operation)

Pos. 030	Operation language
A	German
B	English
C	French
D	Italian
E	Spanish
F	Dutch
G	Danish
K	Czech
P	Polish

Pos. 040	Sample distribution
A	1 x 20 litre composite container, PE
B	12 x 2 litre bottle, PE 24 x 1 litre
C	bottle, PE 12 x 1 litre + 6 x 2 litre
D	bottle, PE 8 x 1.8 litre bottle, glass 12
E	x 0.7 litre bottle, glass 1 x 5 litre
F	composite container, glass
G	Electrical version

Pos. 050	
1	Basic version
2	Basic version + RS232 cable + ReadWin® 2000

Pos. 060	Peristaltic Pump
A	6 m suction height
B	8 m suction height

RPT20-	⇐ Order code

Liquiport 2000 Ex portable sampler
Portable, battery-powered sampler for use in Ex areas with time, flow or event-controlled sampling of liquid media from 20 to 9999 ml using peristaltic pump. Menu-guided operation with "Quick-Setup", 2 digital inputs/outputs, 1 analog input, standard outer diameter/height 480 x 700 mm, standard empty weight: approx. 25.5 kg, sampling height: 6 m, max. 8 m, length: max. 30 m, line connection ID 10 mm, supplied accessories: 6 m / 8 m suction line, ID 10 mm

Pos. 010	Approval										
	A	ATEX II2G EEx dem[ib] IIC T4									
Pos. 020		Control unit									
		A	1x user mode 7x								
		B	user mode								
Pos. 030			Power supply								
			1	Ex-accumulator 12 V, 12 Ah + charger							
			2	Ex-accumulator 12 V, 12 Ah							
			3	Ex-accumulator 12 V, 12 Ah + charger 100...240 VAC							
Pos. 040				Operation language							
				A	German						
				B	English						
				C	French						
				D	Italian						
				E	Spanish						
				F	Dutch						
				G	Danish						
				K	Czech						
				P	Polish						
Pos. 050					Sample distribution						
					1 x 20 litre composite container, PE						
				A	12 x 2 litre bottle, PE						
				B	24 x 1 litre bottle, PE						
				C	12 x 1 litre + 6 x 2 litre bottle, PE						
				D	8 x 1.8 litre bottle, glass						
				E	12 x 0.7 litre bottle, glass						
				F	1 x 5 litre composite container, glass						
				G							
Pos. 060						Peristaltic pump					
						1	6 m suction height				
						2	8 m suction height				
Pos. 070							Housing				
							1	Lower part PE, antistatic			
Pos. 080								Electrical version			
								1	Basic version		
								2	Basic version + RS232 cable + ReadWin 2000		
Pos. 090									Mechanical version		
									A	Basic version	
										⇐	
RPT22-	A						1		A		Order code

Accessories

Liquiport 2000 and Liquiport 2000 Ex accessories

Order code	Accessory
51004744	2 x Spare pump hose ZP6M 2 x Spare pump
51004745	hose ZP8M Suction filter cpl., for use with 10
51002425	mm line Suction line, PVC meshed, clear, ID
50053928	10 mm Suction line, NBR, black, ID 10 mm
50070341	Line connection nipple kit Suction strainer
51003971	V2A, 500 mm Distributer arm with locking
51003198	screws Composite container conversion kit
51003193	20 l, PE Composite container 20 l with cap
RPT20A-RA	
51003410	

Liquiport 2000 accessories

Order code	Accessory
51003199	Battery 12 V 12 Ah Suspension harness kit Bottles PE 12 x 2 l with cap Bottles PE 24 x 1 l with
51003191	cap Bottles glass 8 x 1.8 l with cap Bottle PE 2 l with cap Bottle PE 1 l with cap Bottle glass 1.8 l
RPT20A-FA	with cap Bottle glass 0.7 l with cap Composite container 5.0 l, glass with cap Charger 230V,
RPT20A-FB	12V/2.7A, IP20 (not adapted for buffer charging operation Charger 230V, 12V/3A, IP65
RPT20A-FC	(adapted for buffer charging operation) Charger (wide range) 100 to 240 V, 12 V/2.0 A, IP30
RPT20A-FD	(adapted for buffer charging operation) Cable adapter charger-accumulator Spare accumulator
RPT20A-FE	with charger adapter cable 12 bottles PE conversion kit 24 bottles PE conversion kit 8 bottles
RPT20A-FF	glass conversion kit (from software V3.03) 12 bottles glass conversion kit Composite container
RPT20A-FG	conversion kit 5 l, glass
RPT20A-FH	
RPT20A-LA	
RPT20A-LB	
RPT20A-LC	
RPT20A-LL	
RPT20A-LK	
RPT20A-RB	
RPT20A-RC	
RPT20A-RD	
RPT20A-RE	
RPT20A-RF	

Liquiport 2000 Ex accessories

Order code	Accessory
RPT22A-LA	Charger 12 V/ 2.7 A IP20 for Ex battery Charger (wide range) 100 to
RPT22A-LC	240 V, 12 V/2.0 A, IP30, for Ex battery Ex battery 12 V 12 Ah lead gel Ex
RPT22A-LK	battery cable adapter - standard charger RPT20 Bottles PE 12 x 2 l with
RPT22A-LL	cap Bottles PE 24 x 1 l with cap
RPT22A-FA	
RPT22A-FB	

Order code	Accessory
RPT22A-FC	Bottles glass 8 x 1.8 l with cap Bottle PE 2 l with cap
RPT22A-FD	Bottle PE 1 l with cap Bottle glass 1.8 l with cap
RPT22A-FE	Bottle glass 0.7 l with cap Composite container 5.0 l,
RPT22A-FF	glass with cap 12 bottles PE conversion kit 24 bottles
RPT22A-FG	PE conversion kit 8 bottles glass conversion kit (from
RPT22A-FH	software V3.03) 12 bottles glass conversion kit
RPT22A-RB	Composite container conversion kit 5 l, glass
RPT22A-RC	
RPT22A-RD	
RPT22A-RE	
RPT22A-RF	

Documentation

Sampler brochure (FA013C/09/en)
"Liquiport 2000" Operating Instructions (BA116R/09)
"Liquiport 2000 Ex" Operating Instructions (BA165R/09)
Technical Information "MultiSens C600" multi-parameter probe (TI371C/07/en)
ATEX safety instructions (XA037R/09/a3)