

Analyzer

On-line Measuring

Water and wastewater treatment still require analyzers for on-line measuring, justifying their presence next to commonly more reasonable in-situ sensor systems. Especially for utmost precise water analysis – with for i.e. effluent monitoring of wastewater plants requiring automatic calibrations and/or adaption as well as standard DIN procedures for analysis – analyzers are applied. Besides the measuring instruments also the sample preparation is of great importance. Sample preparation and measuring system should correspond to each other in order to guarantee failure-free reliable and accurate measurements. The WTW TresCon® analyzer and PurCon® sample preparation represent a perfectly matching complete system and guarantee best possible measuring results even under most difficult conditions.

Measuring parameters

The WTW analyzer cover a wide range of measuring parameters. Besides the nitrogen parameters ammonium, nitrate as well as nitrite also the phosphate parameters ortho-phosphate and total phosphate can be measured by the TresCon® analyzer family. Mainly photometric and potentiometric procedures are used.

Controlling

When the main focus is set on the control/regulation of processes, it is advisable to use in-situ sensors for fast, continuous monitoring of measuring values, whenever possible. In such cases it sometimes becomes acceptable, when measurings are less precise and do not comply with the DIN standard. Only a high process transparency enables to develop efficient controlling strategies. Reliable and

immediately accessible measuring data of all process relevant parameters are precondition for process transparency. This was well exemplarily processed during the last years regarding the optimization of nitrification and denitrification: Through ion-selective in-situ ammonium and nitrate measurements of WTW's VARION®, AmmoLyt®, and NitraLyt® and additionally the spectral in-situ nitrate measurement using NitraVis® sensor did not only improve the nitrogen elimination but also cut costs considerably.

Phosphate parameter

Both measuring parameters ortho-phosphate and total phosphor cannot be determined by ion-selective or spectral measurement. However, analyzer as the currently exclusive automatic measuring instruments enable the determination of both parameters.

For this reason analyzers are so far the only alternative for the total-phosphor measuring – i.e. for wastewater treatment discharge monitoring – and for ortho-phosphate elimination through controlled adding of precipitation solution.

Special applications

Also with special applications and process related difficult applications, analyzers can outperform in-situ measurements. Especially related to contamination problems such as for extremely grease contaminated wastewaters special cleaning liquids can be used for analyzers especially developed for this condition. In-situ measuring sensors the automatic cleaning with cleaning liquids is not given and also not

feasible unless further efforts are undertaken. Also the option to operate the analyzers with sea-water applications such as fishfarming or fishtanks enables the automatic measuring of some parameters, such as ammonium or nitrate, considering that ion-selective or spectral optical methods cannot be applied in those areas.

Sample dilution

Furthermore, analyzers offer the possibility to attenuate the sample using distilled or deionized water and therefore finally enable a measuring with high parameter concentrations.


 General Description
of Meters

Monitors

IQ_SENSOR NET

Analyzer

 Sample
Preparation

Samplers

Accessories

 Measuring
stations

TresCon® – Systematic On-line Analysis

For Continuous Monitoring and Process Control

As the need for higher quality measurements in water and wastewater plants increases so does the complexity and degree of automation. Practical and maintenance-free instruments to continuously monitor these processes requires that those instruments be also rugged and efficient. The TresCon® Multi-parameter System exceeds all requirements for accurate and precise continuous measurements.



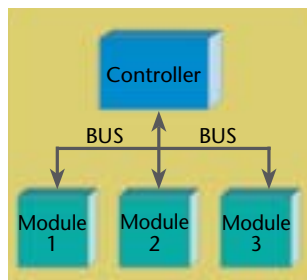
TresCon®

- Simultaneous analysis of up to three parameters
- Easily upgradeable
- Reliable & Accurate

A Progressive Design – Modular System

The TresCon® 's individual system components, the central control unit and the self-contained analyzer modules, have their own microprocessors which can perform specific tests independently.

The controller and the module communicate via high speed internal connections. Real-time control of the most difficult tests are easily accomplished with the TresCon® 's superior design. System can be custom designed to meet the operator's needs.



① System Controller Module

Equipped with a fast microprocessor, the controller includes a graphic display unit, a control panel and all the input/output interfaces. The controller inputs all application functions, calibration protocols, processing and storage of data and the display of measured results.

If modules are added or exchanged TresCon® will automatically recognize the new parameter and automatically updates the system. No operator servicing is required.

② Analysis Modules

The analyzer modules are microprocessor-based, self-contained system components which will operate completely independent of each other. Up to three modules, in any combination of parameters, can be integrated into a single TresCon® system. The modules can be for the same parameter from different sample sites, or for any combination of the available parameters.

- NH₄-Module (Ammonium-Nitrogen)
- NO₃-Module (Nitrate-Nitrogen)
- NO₃/SAC-Module (Nitrate-Nitrogen and SAC)
- NO₂-Module (Nitrite-Nitrogen)
- PO₄-Module (Orthophosphate)
- ΣP-Module (Total Phosphorus)

Retrofitting or exchanging a module can be carried out in a few minutes. The new module is automatically recognized by the TresCon® controller and is immediately ready to use.

③ System Mounting

The stainless steel mounting column is an integral part of the TresCon® system. It is used for simple wall mounting and also contains the wide-range power supply for TresCon®.

④ Supplies Tray

A tray holds all bottles and containers for reagent, standard and cleaning solutions. The containers are color-coded so that parameters and connections can be easily connected.



Ammonium-Nitrogen

Nitrate-Nitrogen/SAC



Nitrite-Nitrogen

Orthophosphate



Total Phosphorus

 General Description
of Meters

Monitors

IQ SENSOR NET

Analyzer

 Sample
Preparation

Samplers

Accessories

 Measuring
stations

User Interface

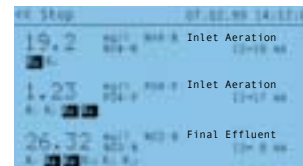
Simple Operation

- Uniform user interface for the complete system
- Uniform operation of all analysis parameters
- Clear and logically structured system program
- Rapid and safe input by 8 function and control keys
- Quick Start Guide/ Instruction Manual



Easy-to-read information and graphical presentation

- High-resolution backlit graphics display
- Up to 3 measuring parameters at a glance
- Clear presentation of measurement, units, individual text and assigned relays and current interfaces
- Daily or weekly trend curves for individual or several parameters in a single graph
- Status line for auxiliary information



Auto Functions of All Modules

AutoClean®	An innovative method for automatic self-cleaning whose high efficiency allows measurements in slightly polluted wastewater, e.g. in sewage treatment plant effluent, without sample preparation.
AutoCal	Automatic calibration and plausibility check at predefined time intervals – resulting in a higher degree of accuracy.
AutoKorr	A correction algorithm developed by WTW for compensating background color in the sample in photometric measuring methods.
AutoFlow	Function for continuously monitoring the container filling levels and the sample/reagent flow in the module and for producing useful maintenance messages.
AutoTherm	Automatic temperature control means that ambient temperature influences on the analytical results can be disregarded.
Intervall	Software function for regular measurements at selectable intervals.
Intervall-Program	Measuring program – for a period of one week the measuring intervals within two-hour sections can be defined. This allows extremely reagent-saving operation in periods where experience has shown that only slight variations in the measurements are to be expected.

System Inputs & Outputs

TresCon® standard features include a number of analog and digital outputs, which provide enhanced data management and control capabilities of the system. All inputs and outputs can be assigned at will to the installed analyzer modules and freely configured.

Serial Interfaces

Two serial input/output interfaces which can be operated independently are standard equipment in the analyzer. While the RS 232, for example, is linked to a local device for data recording – such as a printer –, the RS 485 interface allows for remote control of the unit.

If a telephone connection is available then TresCon® can be accessed and controlled by a remote computer via the RS 232 interface and a modem. The RS 485 interface also allows TresCon® to be coupled to PROFIBUS-DP by using a gateway.

PID Control

As an alternative to outputting the measured values, the analog outputs of TresCon® can also be used as PID controllers for control and feedback control purposes.

Proportional Control (PW/PF)

As well as being used for report or limit contacts, each relay can also be programmed as an impulse or frequency controller. Depending on the control function, in I/F control either the impulse length (I-control) or the impulse frequency (F-control) of the output signal is varied.

TC/PU 1 Two-Channel Permeate Switcher

By means of the TC/PU 1 Two-Channel Permeate Switcher TresCon® can analyze samples from two different sampling locations in sequence. As the two analyzer samples, e.g. the permeate flows from two PurCon® systems, are directly in contact with the switching valve, any alteration in concentration of either of the permeate flows can be registered within minutes. Up to three TresCon® modules can be con-

nected to the TC/ PU 1 Two-Channel Permeate Switcher. It is available as an accessory and can be mounted on the side of the TresCon® stand in a space-saving manner. Control is via the TresCon® terminal. The mA outputs and relays can be parametrized accordingly so that no additional external reporting units are necessary.

Technical Data TresCon®

Sample preparation	TresCon® analyzer modules require continuous sample input with a low solids content; typical sample preparation with PurCon® (see Sample Preparation Section).
Sample delivery	Sample presented for analysis in overflow vessels supplied; up to three analyzer modules can be connected to one overflow vessel. Operation with up to three overflow vessels is also possible (parallel analysis of different samples).
Interfaces	3 freely configurable galvanically separated 0/4-20 mA outputs, 12 potential-free relays, freely configurable, RS 232, RS 485.
Electrical connections	230 VAC ± 10%, 50 Hz / 115 VAC ± 10%, 50 – 60 Hz
Ambient conditions	Storage temperature – 77 ... 140 °F (25 ... 60 °C), operating temperature 32 ... 104 °F (0 ... 40 °C), climate class 4, VDI/VDE 3540 Bl. 2
Test marks	CE, DIN-GOST
Instrument protection	Safety class I according to IEC 1010-1/EN 61010-1
Weight	Empty housing: 59.5 lb (27 kg); each module: 22 lb (10 kg); mounting column: 55 lb (25 kg)
Guaranty	2 years for defects of quality

Ordering Information

Ein TresCon® basic instrument (without module) consisting of:	TresCon® terminal, mounting column, reagent tray, overflow vessels for max. three modules, terminal operating instructions (German) If operating instructions in English are required these must be ordered separately.	Order No.
--	--	------------------

		1 st Module	2 nd Module	3 rd Module
TresCon® basic instrument (with first analyzer module)				
TresCon® Ammonia, A111	Basic instrument with ON 110 module for Ammonium-Nitrogen	8A-1	<input type="checkbox"/>	<input type="checkbox"/>
TresCon® Nitrate, N211	Basic instrument with ON 210 module for Nitrite-Nitrogen	8A-2	<input type="checkbox"/>	<input type="checkbox"/>
TresCon® Nitrite, N511	Basic instrument with ON 510 module for Nitrite-Nitrogen	8A-3	<input type="checkbox"/>	<input type="checkbox"/>
TresCon® Orthophosphate, P211/MB 1	Basic instrument with OP 210/MB1 module for Orthophosphate (measuring range 1)	8A-4	<input type="checkbox"/>	<input type="checkbox"/>
TresCon® Orthophosphate, P211/MB 2	Basic instrument with OP 210/MB2 module for Orthophosphate (measuring range 2)	8A-5	<input type="checkbox"/>	<input type="checkbox"/>
TresCon® Orthophosphate, P211/MB 3	Basic instrument with OP 210/MB3 module for Orthophosphate (measuring range 3)	8A-6	<input type="checkbox"/>	<input type="checkbox"/>
TresCon® Nitrate/SAC, S211	Basic instrument with OS 210 module for Nitrate-Nitrogen and SAC	8A-7	<input type="checkbox"/>	<input type="checkbox"/>
TresCon® Total Phosphorus, P511	Basic instrument with OP 510 module for Total Phosphorus (requires two module places)	8A-8	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ordering options for additional analyzer modules (2nd/3rd modules)				
	Without additional analyzer module		<input type="checkbox"/>	<input type="checkbox"/>
	NH₄ analyzer module (Ammonia-Nitrogen), OA110		<input type="checkbox"/>	<input type="checkbox"/>
	NO₃ analyzer module (Nitrate-Nitrogen), ON210		<input type="checkbox"/>	<input type="checkbox"/>
	NO₂ analyzer module (Nitrite-Nitrogen), ON510		<input type="checkbox"/>	<input type="checkbox"/>
	PO₄ analyzer module (Orthophosphate), OP 210/MB1		<input type="checkbox"/>	<input type="checkbox"/>
	PO₄ analyzer module (Orthophosphate), OP 210/MB2		<input type="checkbox"/>	<input type="checkbox"/>
	PO₄ analyzer module (Orthophosphate), OP 210/MB3		<input type="checkbox"/>	<input type="checkbox"/>
	NO₃/SAC analyzer module (Nitrate-Nitrogen and SAC), OS 210		<input type="checkbox"/>	<input type="checkbox"/>
Other ordering options				
	Without feet (wall mounting with mounting stand)			<input type="checkbox"/>
	With feet (free-standing arrangement)			<input type="checkbox"/>
Please complete the ordering number by entering the required versions:		<input type="text"/>	<input type="text"/>	<input type="text"/>
Ordering example:	TresCon® Ammonium A111 with additional nitrate module, for wall mounting with mounting stand	8A-1	<input type="checkbox"/>	<input type="checkbox"/>



The technical data of the analyzer modules can be found on pages 48 to 57.



TresCon® Uno

- Compact dimensions
- Economical
- Easy to Use

Online-Analysis – reliable · compact · economical

The new TresCon® Uno uses a single channel version of our popular multi channel TresCon® Analyzer. The TresCon® Uno instruments are designed for control and monitoring at waste water treatment plants. The compact size of TresCon® Uno at a reasonable price offers to the user a good price-performance-ratio for the measurement of nutrient parameters.

System Description:

TresCon® Uno consists of a basic unit ①, an analyzer-module ②, and a reagent tray ③. System can be wall mounted.

Operation safe and Service friendly:

Many automatic diagnosis functions help the user with operation and maintenance. The modular design allows for the quick and easy exchange or replacement of modules.

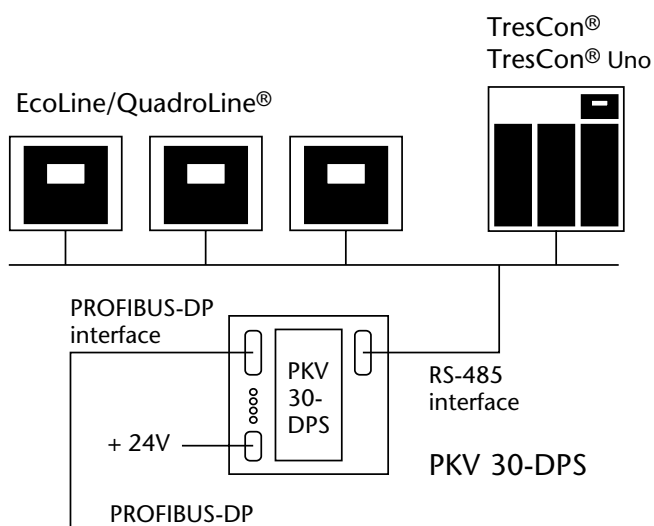


Maintenance and Service

TresCon® systems are service-friendly requiring little or no maintenance. The numerous useful system functions are easily accessed and changed. The operator is also prompted as to service intervals automatically. It has also been designed for easy access and maintenance.

The Instruments include:

- big graphical display
- three 0/4-20 mA outputs
- 12 relay interfaces
- RS 232 interfaces
- RS 485 interfaces
- different controller functions (PID, pulse-width, frequency)



Connection to PROFIBUS-DP via Protocol Converter

Technical Data TresCon® Uno

TresCon® Uno			
Measuring ranges <i>Detailed technical data: see TresCon® modules in parameter section*</i>	Ammonium:	0.05 ... 1000 mg/l NH ₄ -N	*See also OA 110, page 48
	Nitrate:	0.10 ... 60 mg/l NO ₃ -N	*See also ON 210, page 52
	Nitrite:	0.05 ... 1,200 mg/l NO ₂ -N	*See also ON 510, page 53
	Orthophosphate Range 1:	0.05 ... 3,00 mg/l PO ₄ -P	*See also OP 210, page 56
	Orthophosphate Range 2:	0.10 ... 10,0 mg/l PO ₄ -P	*See also OP 210, page 56
	Orthophosphate Range 3:	0.10 ... 25,0 mg/l PO ₄ -P	*See also OP 210, page 56
	Nitrate/SAC:	0.10 ... 60 mg/l NO ₃ -N / 0.10 ... 200 m ⁻¹	*See also OS 210, page 52
Calibration	Automatic 2-point-calibration (works calibration for N211 and S211)		
Measurement intervals	Cont., 5, 10, 15, 20, 25, 30 min to be set depending on the parameter		
Sample preparation	Depending on the application: none, PurCon® or PurCon® IS		
Mains	230 VAC ± 10%; 50 Hz / 115 VAC ± 10%; 50/60 Hz		
Operation temperature	32 ... 104 °F (0 ... 40 °C)		
Dimensions, Weight (W x H x D, lb/kg)	Analyzer:	24.1 x 30.5 x 13 in. (612 x 775 x 329 mm), approx. 77.2 lb/35 kg	
	Reagent tray:	23.2 x 2 x 14.2 in. (590 x 50 x 360 mm), approx. 37.5 lb/17 kg	
Guaranty	2 years for defects of quality		

Ordering Information

TresCon® Uno			Order No.
TCU/A111	TresCon® Uno – Ammonium	NH ₄ -N	820 101
TCU/N211	TresCon® Uno – Nitrate	NO ₃ -N	820 102
TCU/N511	TresCon® Uno – Nitrite	NO ₂ -N	820 103
TCU/P211-MB1	TresCon® Uno – Orthophosphate Range 1	PO ₄ -P/MB1	820 104
TCU/P211-MB2	TresCon® Uno – Orthophosphate Range 2	PO ₄ -P/MB2	820 105
TCU/P211-MB3	TresCon® Uno – Orthophosphate Range 3	PO ₄ -P/MB3	820 106
TCU/S211	TresCon® Uno – Nitrate/SAC	NO ₃ -N / SAC	820 107

