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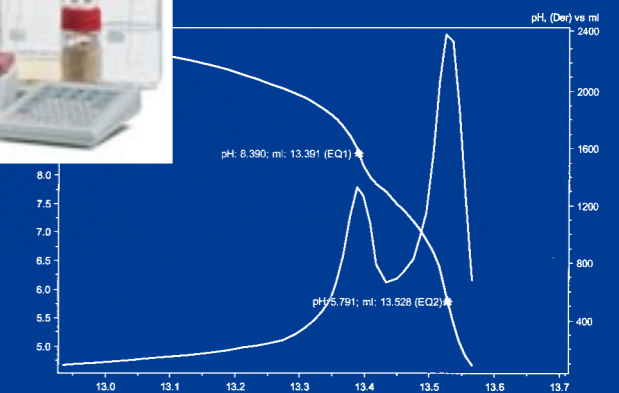
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EQ

TITRONIC® and TitroLine

From simple piston burettes
to fully automatic titration equipment



EP

ppm H₂O

ml

EQ

EP

ppm H₂O

ml

EQ

EP

ppm H₂O

ml

SCHOTT-GERÄTE GmbH

P.O. Box 2480

55014 Mainz

Hattenbergstrasse 10

55122 Mainz

Germany

Phone: +49 61 31 / 66 - 51 11

Fax: +49 61 31 / 66 - 50 01

E-mail: titration@schott.com

www.schott.com/labstruments

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SCHOTT
glass made of ideas

SCHOTT
glass made of ideas

Titration by Schott: simple, fast and flexible

Our know-how to your advantage.

In addition to laboratory glass SCHOTT has been developing and selling electrodes and electrochemical measuring instruments such as pH meters, conductometers and oxygen measuring instruments for more than 60 years.

SCHOTT is also one of the leading manufacturers of titration units such as piston burettes, automatic titrators and specialized Karl Fischer titrators.

Titration by SCHOTT means

- ▶ reliable and quick results
- ▶ product range in a good price/performance relationship
- ▶ service and support.

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TITRONIC® *basic* The burette that clicks

The TITRONIC® *basic* is a good alternative to all bottle top burettes and conventional glass burettes. All manual titrations can be performed in the laboratory, quickly, accurately and safely.

Easy to use

Simply press the 'mouse' to begin the titration process. Titrations can be performed at three different speeds.

Dosing Unit

The integrated 20 ml dosing unit with an ultraviolet protection sleeve, fills itself automatically.

Precise dosing technology

The high precision cylinder made of DURAN® borosilicate glass and automatic valve guarantees absolute accuracy.

Stirrer

The magnetic stirrer is connected directly to the burette for power.

Documentation of the results

An easy to read LCD with a large scale dialog display ensures that you can clearly read the results. Connection to a printer or PC through the RS-232-C interface is also possible.

Printer

We recommend using the RS-232-C printer (TZ 3460), although any printer with serial interface can be connected.

Chemically resistant materials

All parts that may come into contact with solvents are manufactured from chemically resistant materials.



Technical data

Keyboard	Miniature 4-pole round socket
RS-232-C	For connection of serial printer
Display	Four digit LCD display, 20 x 48 mm, height of digits: 12.7 mm
Volume display	00.00 ... 999.9 ml
Resolution	0.01 ml
Cylinder	20 ml borosilicate glass
Dosing accuracy	Systematic error 0.1 %, Random error 0.05 % Determined according to EN ISO 8655
Valve	3/2-port directional control valve made of PTFE/ECTFE
Hoses	FEP with UV protection
Housing material	Polypropylene and Polyflam RPP 371 NT, 20 % talcum
Front foil	Polyester
Dimensions	134 x 310 x 205 mm (WxHxD), without stirrer
Weight	approx. 2.1 kg
Temperature	+10 °C ... +40 °C
Power supply	230 V; 50/60 Hz or 115 V; 50/60 Hz
Consumption	18 VA
Safety	Protection Glass II in accordance with DIN EN 61 010, Part 1
CE Mark	Guideline 72/23/EEC

Motor-driven 3/2-port directional control valve

Unpressurized suction and dosing is possible with this automatic valve which is made of high-grade and high-resistant material. This means the production of gas during the filling of the cylinder is eliminated.

TITRONIC® *universal*

Everything dosing. Fast and precise.

The TITRONIC® *universal* not only allows you to perform dosing operations quickly and easily but also accomplishes manual titrating operations without difficulty. The burette can be used with all dosing liquids, solvents and titrants.

Dosing and titrating

The adjustment of any dosing volume and the dosing speed is done simply by pressing a button. For incremental dosing operations, the entry of the volume and the waiting time between the volume increments can be adjusted just as easily and quickly.

Manual titrating operations

are performed using the hand control element, whereby 0.01 increments and 7 different titrating speeds are available. In addition, you can also call up a pre-titrating volume prior to each titration in order to reduce the titrating time.

PC control system

All functions of the TITRONIC® *universal* unit can be controlled via a serial interface (e.g. PC). The address setting is made automatically or manually. For complex dosing and titration processes, the 'daisy chain' option can be used

to connect up to 16 burettes in series. The units are simply connected to one another via an additional RS-232-C interface. No additional data line is required as, each unit is separately addressable and provides feedback information.

Dosing units

The integrated 20 ml or 50 ml dosing unit with UV protective sleeve fills itself automatically.

Precise dosing technology

The high-precision glass cylinder made of DURAN® borosilicate glass and the motor-driven, chemical resistant compressed-air valve guarantees absolute accuracy.

Motor-driven 3/2-port directional control valve

Unpressurized suction and dosing is possible with this automatic valve which is made of high-grade and high-resistant material. This means the production of gas during the filling of the cylinder is eliminated.

Keyboard

Six keys on the unit are used to carry out the dosing operations and to adjust the pre-titrating volume, titrating speed and other parameters. The hand control element can be used to perform manual titrating operations and to start or stop the dosing operations.

Documentation of results

This is assured by the easy-to-read LCD with its large-scale dialog display, background illumination and contrast adjustment. A printer or PC can be connected using one of the two serial RS-232-C interfaces.

Chemically resistant materials

All parts that may come into contact with solvents are manufactured from chemically resistant materials.

Languages

Four languages are available (German, English, French, Spanish).

Technical data

Keyboard connection	Miniature 4-pole round socket, conforming to DIN standards, for the hand control element TZ 3680
Stirrer connection	Plug-and-socket connection with integrated low-voltage power supply (15 V DC) for the TM 96 magnetic stirrer
RS-232-C interface no. 1	For connecting a printer with a serial interface or a PC to document the consumption in ml or for data backup
RS-232-C interface no. 2	Connection of additional piston burettes, TITRONIC® <i>universal</i> ('Daisy Chain'), miniature 4-pol round socket
Configuration of the RS-232-C interface	Adjustable: baud rate: 1200, 2400, 4800 or 9600 baud, word length: 7 or 8, parity: no, even or odd, Present: 2 stop bits
Display	8-line LCD display, 39 x 69 mm, 128 x 64 pixel, background illumination and contrast adjustment
Volume display	00.00 ... 999.9 ml
Display resolution	0.01 ml (at volume <100 ml), 0.1 ml (at volume >100 and <1000 ml), 1.0 ml (at volume >1000 ml)
Dosing volume	0.01... 999.99 ml
Dosing speed	0.1... 40 ml/min (with 20 ml dosing unit) 0.1... 100 ml/min (with 50 ml dosing unit)
Filling time	30s to 999s adjustable (100 % in relation to the cylinder volume)
Pre-titrating volume	0.1... 99.99 ml
Increment volume	0.01... 999.99 ml
Waiting time between the increments	0.1... 999.9 s
Cylinder	20 or 50 ml DURAN® borosilicate glass cylinder with UV protection sleeve
Dosing accuracy	Systematic error 0.1 %, Random error 0.05 % Determined according to EN ISO 8655
Valves	3/2-port directional control valve made of PTFE/ECTFE
Hoses	with UV protection
Housing material	Polypropylene and Polyflamm RPP371 NT, 20 % talcum
Front foil	Polyester
Dimensions	134 x 310 x 205 mm (W x H x D), including dosing unit, without stirrer
Weight	approx. 2.1 kg
Ambient temperature	+10 °C ... +40 °C (for operation and storage)
Power supply	230 V~; 50/60 Hz or 115 V~; 50/60 Hz
Power consumption	18 VA
Appliance safety	Correspsds. to Protection Class II in accordance with DIN EN 61010, Part 1
Conformity	EN ISO 8665, Part 3



TitroLine *easy*

The automatic pH/mV titrator for everyday routine.

Now you can take advantage of Schott's many years of titration experience simply by pressing the button on this small Titrator. TitroLine *easy* for precise and quick pH and mV titrations.

Three types of titration

For fast and optimal titrations with no additional parameterization, you can carry out titration measurements with a self-selecting end point, with preset end point or manually with the mouse.

Dosing unit

This integrated 20 ml dosing unit with an ultraviolet protection sleeve fills itself automatically.

Precise dosing technology

The high-precision glass cylinder made of DURAN® borosilicate glass and the motor-driven, chemical resistant compressed-air valve guarantees absolute accuracy.

Sensors

We recommend using combination electrodes from Schott.

Although pH-combination electrodes with integrated temperature sensor (Pt 1000) or indication and reference electrodes can be utilized.

Buffer solutions

Schott buffers 2.00/4.00/4.01/6.87/7.00/9.18/10.00/12.45, along with their temperature functions, are stored in the TitroLine *easy*.

Documentation of the results of measurement

This is assured by the easy-to-read LCD with its large-scale dialog display, background illumination and contrast adjustment.

A printer or a PC can be connected at the serial RS-232-C interface.

Printer

We recommend the printer TZ 3460.

Chemically resistant materials

All parts that may come into contact with solvents are manufactured from chemically resistant materials.

Languages

Four languages are available (German, English, French, Spanish).

Examples of applications for TitroLine *easy*

Salt content in food stuffs (cheese, soya sauce, ketchup)

Total acidity in wine and beverages

Nitrogen according to Kjeldahl

Iodometric and other redox titrations

Alkalinity

Chlorid in drinking water



Technical data

Measuring amplifier	Measuring input pH/mV electrode: pH-input with 12-bit converter for highly accurate resolution of the measuring signal during titration Measuring range pH: 0.00 ... 14.00 Measuring range mV: -1900 ... +1900 Electrode socket according to DIN 19 262 or BNC socket and reference electrode 1 x 4 mm Measuring input temperature sensor Pt 1000 Measuring range: -30 °C ... +115 °C Connection sockets 2 x 4 mm and 1 x 2 mm
Keyboard connection	Miniature 4-pole round socket, conforming to DIN standards for the hand control element TZ 3680
Stirrer connection	Plug-and-socket connection with integrated low-voltage power supply (15 VDC) for the magnetic stirrer TM 96
RS-232-C interface	For connecting a printer with a serial interface or a PC for documentation or for data backup, Miniature 4-pole round socket
Configuration of the RS-232-C interface	Preset: 4800 baud, 7-bit word length, 2 stop bits, no parity
Display	Matrix LCD-Display with 64 x 128 pixels, background illumination and contrast adjustment
Volume display	00.00 ... 999.9 ml
Display resolution	0.01 ml
Cylinder	20 ml DURAN® borosilicate glass cylinder with UV protection sleeve
Burette resolution	1/8.000
Dosing accuracy	Systematic error 0.1 % Random error 0.05 % Determined according to EN ISO 8655
Calibration	Two-point calibration, selection of eight stored buffer solutions in conformity with DIN 19266 and NBS
Valves	3/2-port directional control valve made of PTFE/ECTFE
Hoses	FEP with UV-protection
Housing material	Polypropylene and Polyflam RPP 371 NT, 20 % talcum
Front foil	Polyester
Dimensions	134 x 310 x 205 mm (W x H x D), including dosing unit, without stirrer
Weight	approx. 2.4 kg
Ambient temperature	+10 ... +40 °C (for operation and storage)
Power supply	230 V~; 50/60 Hz or 115 V~; 50/60 Hz
Power consumption	24 VA
Appliance safety	corresponds to Protection Class II in accordance with DIN EN 61 010, Part 1
Conformity	EN ISO 8665, part 3
CE mark	in accordance with Council Guideline 89/336/EEC (EMV = electromagnetic compatibility)

TitroLine KF

The titrator that finds the water in your sample.

Everything included

The TitroLine KF includes everything you need to determine the water content according to the Karl Fischer method. The measuring set-up consists of titrator, reagent bottle, titration stand, titration vessel, electrode, and a starter kit (6 syringes with hollow needles, molecular sieve, and three ampoules with water). Everything that you need is included.

We'll always tell you what comes next. The large display of the TitroLine KF is ideal. The illuminated LCD display allows permanent dialogue with the user. This dialogue of course includes a user interface always telling you which button to press next on every level.

Titration stand

With the titration stand, titrated samples are removed simply with the press of a button. Another press of the button and fresh solvent is supplied. A magnetic stirrer evenly mixes solvent and sample. The titration vessel is leakproof, so permeation of moisture is totally prevented (-> low "drift"). The detachable glass vessel is easy to clean and available in two sizes.

Methods

The TitroLine KF provides the following methods for you: sample titration, titre water, titre liquid standard, titre tartratedihydrate, blank value oven, and blank value solvent.

Titration parameters

The methods provided with the TitroLine KF are pre-set with widely used parameters. Any parameter can be changed if required. Pre-titration volumes can be programmed for anticipated high volumes. For slow dissolving samples an extraction time is available. Either drift or time can be used for end criteria. Any KF solvent can be used effectively by varying the current or pole voltage. Titration time can be varied in the event that a drying oven is being used. Minimum titration times can be programmed for samples that release moisture slowly.

Documentation

In addition to the indication on the display you can document the results by means of a printer in short, standard or GLP format. GLP documentation includes consumption, result, statistics, originally weighed-in quantity/feed, date, time, sample ID, titre, blank value, drift, titration time, method used, titration parameters, calculation formula with the values used and an additional input field for the user name.

Statistics

To assess the constant quality of the analyses mean value, standard deviation, and relative standard deviation can be determined. The mean value of the titre and the blank value are automatically used for the calculation of the sampling results.

Calculation of the results

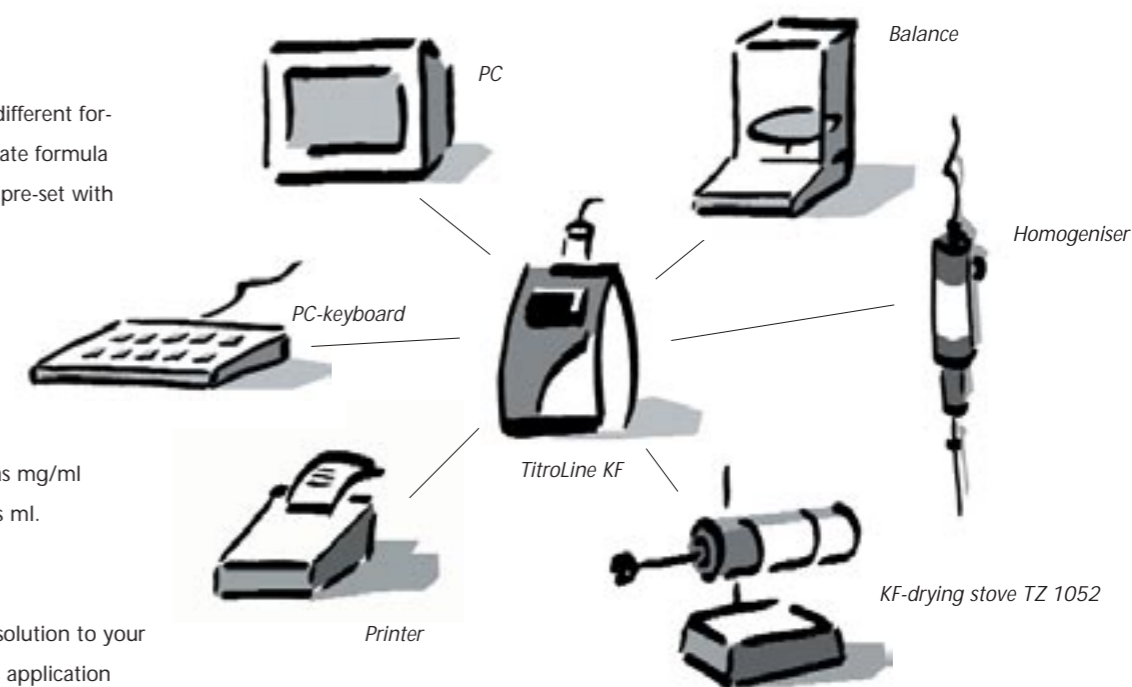
To calculate the results, two different formulas are used. The appropriate formula is automatically selected and pre-set with the correct values when the method is selected. The units in which the results are indicated can be selected: %, ppm, mg, mg/l, mg/pc (pc= piece), and ml. The titre is always indicated as mg/ml and the blank value always as ml.

Application support

We support you in finding a solution to your application problem. Schott's application laboratory has many years of experience with KF titration procedures. This practical know-how has been incorporated in the application manual "KF titration in practice", which is included with the TitroLine KF. Schott has developed an application database. This application database can be ordered separately.

Appliance qualification made easy

The traceability of analysis results plays an important part within the context of quality management systems. We support the user with forms for DQ (Design Qualification), IQ (Installation Qualification), OQ (Operational Qualification), PQ (Performance Qualification).



This provides effective help in planning, commissioning, routine works, and verification of the KF titrator, especially in the pharmaceutical industry. We also make no secret of the test equipment control for our KF titrator. Even the method validation is included in the application manual in a step-by-step instruction.

Titration stand TM KF

With the titration stand TM KF, titrated samples are sucked off simply with the press of a button. Another press of the button and fresh solvent is supplied. A magnetic stirrer built into the TM KF evenly mixes solvent and sample. The titration vessel is very leakproof, so permeation of moisture is almost totally prevented (-> low "drift"). The detachable glass vessel is easy to clean and available in two sizes.

Alphanumeric keyboard

The external keyboard TZ 2825 (optional) allows you to enter an alphanumeric sample name. Any PC keyboard with DIN plug can be connected instead of the splash-proof mini keyboard.

Interfaces and PC control

The TitroLine KF is equipped with two RS-232C interfaces. This allows of simultaneous connection of a balance for automatic taking over of the weighing data and a printer. Of course, a PC can also be connected instead of the printer to receive and process the data of the TitroLine KF. The TitroLine KF can also be completely controlled using PC software.



If you need sometimes more than a Karl-Fischer titrator

It is possible to convert this titrator from a volumetric Karl-Fischer titrator into a standard TitroLine *alpha* for other titrations in a few simple steps by hand.

Titration stand

The TitroLine *alpha* KF is using the same titration stand as the TitroLine *KF*. (see also page 9 and 10).

Standard methods

The methods memory contains 3 *KF* methods that can be called up immediately from the working memories. Up to 8 individual methods can also be set without difficulty and optimally adapted to each sample.

Reagents

All commercially available pyridine-free or pyridine-containing reagents can be used.

Documentation

Following the titration process, the calculated result with the proper unit of measure selected then appears in the display. In addition, proper documentation of the results is then also available using a printer or PC.

You will be given the print-out of the titration graphs in clearly structured DIN A4 format. At the same time, you will also have many different graph types at your disposal.

PC connection

Schott TitriSoft 2.0 titration software can also be used for proper storage of test results and titration graphs or for the purpose of any subsequent recalculations.



Technical data for TitroLine *KF*

Conformity	EN ISO 8655-3
Cylinder	20 ml made of DURAN® (borosilicate glass 3.3)
Valve	motor-driven 3/2-way valve made of PTFE / ECTFE
Hoses	FEP with UV protection
Dosing accuracy	Systematic error 0.1 %; Random error 0.05 %; Determined according to EN ISO 8655-6
Display	matrix LCD 69 x 39 mm, 64 x 128 pixels with background illumination, contrast adjustable
Electrode	connection for double platinum electrode; output voltage 100 mV, adjustable between 5 ... 200 mV by means of software; connection: 2 x 4 mm sockets
Keyboard	5-pole DIN socket for TZ 2825 and PC keyboards with DIN plug
RS-232-C interfaces	two bidirectional RS-232-C interfaces for PC/printer and balance/appliances
Power supply	mains: 230 V~, 50/60 Hz; or 115 V~; 50/60 Hz, power consumption: 30 VA
Housing	Polypropylene
Front foil	Polyester
Dimensions	310 x 265 x 205 mm (H x W x D) with titration stand TM KF and titration vessel 310 x 135 x 205 mm (H x W x D), height inclusive of dosing unit (without titration stand)
Weight	approx. 3.2 kg for complete appliance with titration stand; approx. 2.1 kg for basic appliance
Climate	ambient temperature: +10 ... +40 °C for operation and storage

Subject to technical changes.

DURAN is a registered trademark of the SCHOTT group, Mainz, Germany.

Technical data for TitroLine *alpha* KF

please refer to page 13

TitroLine *alpha*

The fully-equipped titrator.

Compact, flexible and professional.

Compact, space-saving titrator

TitroLine *alpha* is a fully-equipped titrator with an integrated burette module.

Working memories

The titration parameters for numerous applications have been preset. 8 individual applications can be selected from a range of more than one hundred. In this way the TitroLine *alpha* offers operators at all training levels the possibility of carrying out titrations using optimal parameters and without wasting time. Alternatively operators can also enter their own individual methods into the working memories.

Titration at all levels of difficulty

The TitroLine *alpha* is a routine titrator for pH, mV, redox, argentometric, Karl Fischer and pH-stat titrations. The powerful input amplifier can even perform critical applications, such as the determination of the acid or base numbers in oils (TAN, TBN) or other titrations in non-aqueous solvents.

Adaptation to every application

The pre-selected methods contain an optimal adaptation to each particular application. Reagent addition is drift-controlled, either in linear steps or with dynamic adaptation.

Equivalence point titrations

Up to 5 equivalence points can be detected automatically.

End point titrations

Up to 2 pre-selected end points can be titrated.

Documentation

The evaluation of the titration and documentation of the titration curves and results according to GLP practice are adapted to practical requirements and guarantee exact and dependable results.

Calculation of results

Eight equations are available for each of the eight methods in the working memory, from which one can be selected to calculate the results. Blank values and several factors as well as subtraction of end or equivalence points can be taken into account. In this way calculation of back-titrations, titre determinations, etc. is possible.

Method documentation

By specification of

- ▶ alphanumerical method name
 - ▶ alphanumerical sample description
 - ▶ username
 - ▶ time and date
 - ▶ calibration conditions
 - ▶ automatic or manual weighed-in
 - ▶ special conditions for Karl-Fischer-titrations, conditioning, control data, end point criteria
- the important criteria for GLP performance have been fulfilled.

Exchangeable Dosing Units

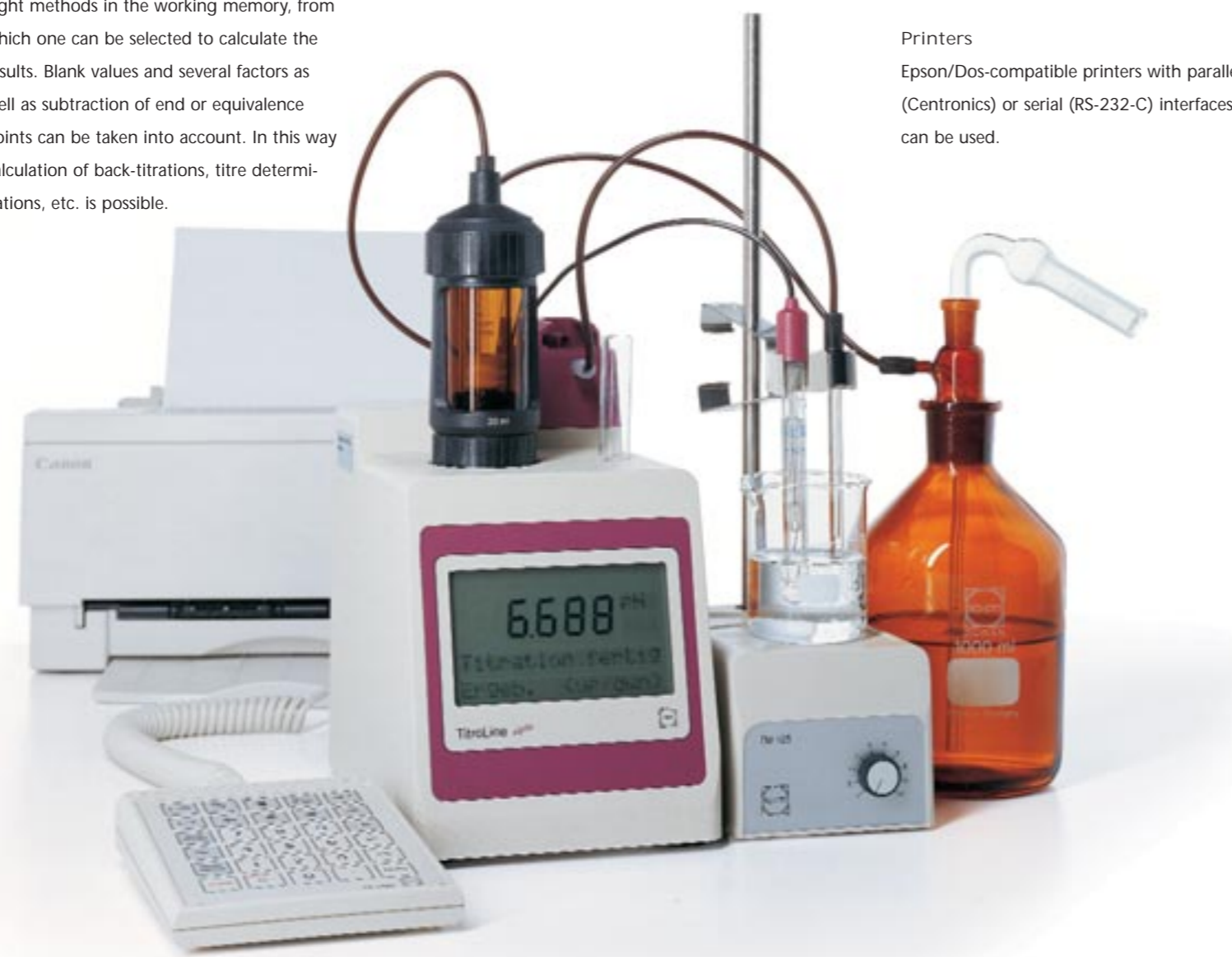
TitroLine *alpha* is being delivered with either a 10, 20 or 50 ml dosing unit. If titrations with different titration agents shall be performed, the dosing units can be changed easily.

Analytical balances

Direct transfer of weighed-in data is possible by connecting an analytical balance. Up to 30 weighing data can be temporarily stored in the buffer memory of the TitroLine *alpha*.

Printers

Epson/Dos-compatible printers with parallel (Centronics) or serial (RS-232-C) interfaces can be used.



Technical data

Measuring amplifier	Electrode input (pH/mV) pH/mV input with 16 bit converter for highly accurate measurement resolution during the titration, Software-controllable signal input delay, Measuring range pH: 0.00... 14.00; Measuring range mV: -1900... +1900
	Electrode socket according to DIN 19 262
	Karl Fischer input Karl Fischer (dead-stop) connection for double platinum electrode; Output voltage: 100 mV, Internally variable (60... 220 mV), Measuring range: 0... 100 µA; Connection: 2 x 4 mm sockets
	Pt-1000 input Temperature sensor connection for Pt 1000 Resistance thermometer, Measuring range: -75 °C... +175 °C; Connections: 2 x 4 mm sockets
Interface RS-232-C, No.1	Connection to PC or serial printer for documentation, data protection and external control, 25-pole socket
Interface RS-232-C, No.2	For TW <i>alpha</i> sample changer, analytical balance connection or dosing burettes TITRONIC universal, T 110, T 200 25-pole socket
RS-232-C interface configuration	Baudrate: 1200, 2400, 4800, 9600 Baud, word length 7 or 8 bit, stop bits: 1 or 2, Parity: even or odd (pre-set in 4 combinations)
Printer connection	Centronics interface for connection of a printer with parallel interface, 25-pole socket
Stirrer connection	For magnetic stirrer TM 125 with connection cable TZ 1581 and mains power supply TZ 1848 or rod stirrer TM 128, 2-pole socket
Keyboard connection	For mini-PC keyboard TZ 2825 or MF 2 in XT model, 5-pole DIN socket
Display	LCD multifunction display, 4-line LC-display, approx. 65 x 110 mm, Measuring value display 4 place, 18 mm high, 4 alphanumeric lines, each 8 mm high, Contrast control and background illumination
Burette module	Selectable from 10 ml, 20 ml and 50 ml dosing modules
Incremental steps	1/5000
Cylinder	DURAN® borosilicate glass with UV protection sleeve
Housing material	Stainless steel/polypropylene, reinforced with glass beadlets; inside metallized for screening purposes
Front foil	Polyester
Housing dimensions	148 x 310 x 210 mm (W x H x D) with cylinder
Weight	3.5 kg
Ambient temperature	+5... +40 °C (for operation and storage)
Power supply	100... 240 V ± 10 % (47... 63 Hz)
Power consumption	35 VA

TW *alpha* sample changer Automatic titration in series

Now that GLP and ISO 900X have been adopted, the number of samples obtained is constantly rising. The new TW *alpha* from Schott will help you to meet these additional requirements. Our sample changer enables you to titrate in series with automatic sample changing.



If you need further details:

Control

The sample changer has a number of commands to help you control it with our TitroLine *alpha* titrator by way of the TZ 1594 connection cable, which is directly connected to the two devices.

Flexibility as a result of a removable sample divider

In order to increase flexibility, you have four sample dividers and various titration heads for different beakers or titrator vessels at your disposal. A mere flick of the wrist is sufficient to change the sample dividers at any time.

The size of the divider is set in the method on the TitroLine *alpha*.

Stirring from 'above' or 'below'

The basic sample changing unit has a magnetic stirrer installed as a standard feature, enabling stirring from 'below'. Depending on the application, the stirring speed can also be changed. Alternatively, you can use a rod stirrer (with two different lower lengths) which enables stirring from 'above'.

Washing the electrode and the titration tip

In order to be sure of obtaining accurate results, it is necessary to clean the electrodes and the titration tip after each titration. This can be accomplished by immersing the electrode and the titration tip in a washing solution, for instance.

The number of washing positions to be used (up to a maximum of three) is set in the method. After titration, the sample changer runs automatically into the position(s) intended for this purpose. Connecting a TP 20 washing unit can speed up the washing of the electrode and titration tip and make it more direct. Then the titration vessel will be cleaned immediately after titration.

TitriSoft 2.0

The optimum solution for your titration tasks

Endless configurations

The titration software, TitriSoft 2.0, is the optimum solution for your titration tasks. Using the software, which operates under WINDOWS 95 and WINDOWS NT, you can connect various Schott equipment units (hardware configurations) to the PC in your laboratory in order to support and simplify your daily work procedure during sample preparations, titrations and evaluation of results. The structure of the software was selected so that it is clear and logical to users of all training levels.

During the installation step, TitriSoft 2.0 automatically recognises whether you are working with a German or with an English WINDOWS version and will then install the correct language version on its own. For all other languages, the English is automatically installed.

Connection Options

TitriSoft 2.0 allows you to control the following equipment:

- ▶ titrators (TitroLine *alpha*)
- ▶ sample changers (TW *alpha*)



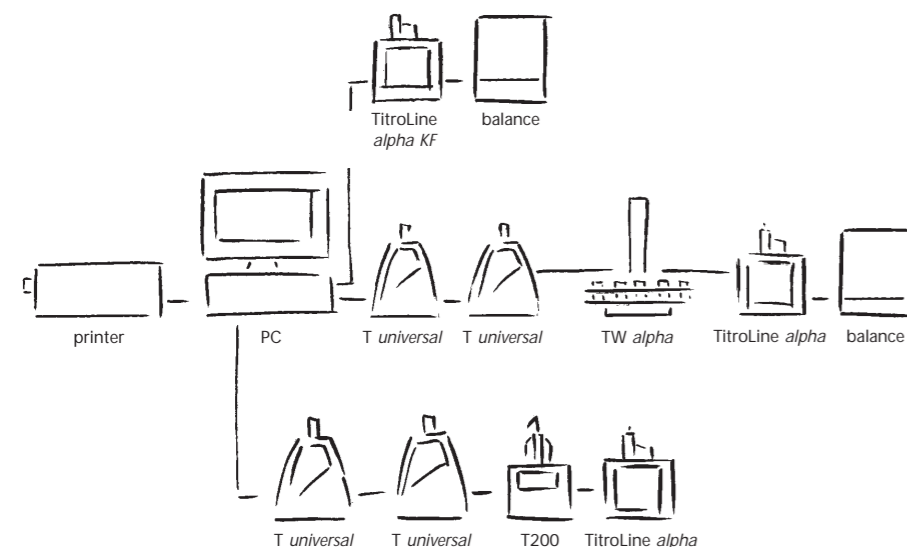
- ▶ burettes (TITRONIC® *universal*, TITRONIC® T 110 and TITRONIC® T 200)
- ▶ additional Schott equipment units (TW 280, TR 250)
- ▶ balances

The titration software can be connected to any serial port that is not being used on your PC. Each of these serial interfaces can be used for various equipment combinations (configurations). For proper automation of titrations, the TitroLine *alpha* with our

sample changer TW *alpha*, for example, is controlled by the software. For more complex titration tasks including sample preparation, the connected burettes take over the required dosing tasks first and then the titration is carried out with the TitroLine *alpha*. It is, of course, also possible to use the software exclusively for dosing operations. The following diagram shows you examples of possible equipment combinations.

- #### Software Structure
- The many different software tasks are sub-divided in four different centers
- ▶ the Titration Center,
 - ▶ the Revision Center,
 - ▶ the Analysis Center and
 - ▶ the Maintenance Center.

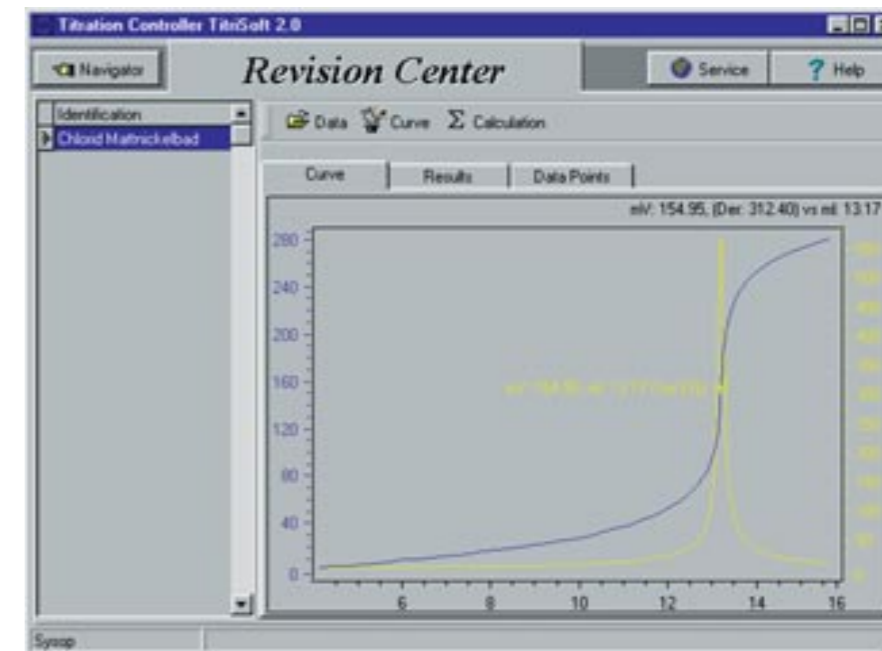
In the main menu, the Navigator, the user is provided with an overview of these centers. In the Navigator menu, service information and using the help button, the software description can also be requested. This on-line help function can be requested anywhere in the program.



Revision Center, import and export Analysis Center

Revision Center

Titration curves, results and measured values of all completed titrations are saved in the Revision Center. On the basis of the sample identification, date, user, method or status, these data can then be selected and requested. The information on the completed titrations can be displayed as a graphical representation, results list or measured value list. Optimisation according to user requirements can be carried out for each saved titration. This means for instance that subsequent or additional calculations can be added and saved or that titration curves can be analysed. Import (TPC 2000 curves, ASCII) or export (ASCII or Excel) options are also available.



Analysis Center

This is where all titration methods are set up and saved. The eight methods of the TitroLine *alpha* can be read into program and then be increased by adding additional methods. Your own methods, which have been adapted to your specific titration problem, can also be prepared and saved in

unlimited numbers using the PC. Titrations are then controlled with the PC or started by the PC and carried out with the TitroLine *alpha*. The reagents being used, the calibration data of the sensors being employed, precise sample data, average values and global values (e.g. blank values) can be saved for all these methods. Accordingly, you will then have the sample or

method characteristics at your disposal for all methods and can call them up anytime. If the methods saved in the TitroLine *alpha* are integrated in the configuration, these methods can be expanded with various functions in order to adapt the methods to your requirements in the best possible manner. This usually involves additional

calculations or reagent dosing operations but detailed method descriptions, for example, can also be added. Additional important method elements are dosing operations performed with one or several burettes, repetition of individual elements and if-instructions, e.g. the use of many different formulas depending on specific consumption rates in each instance.

The method preparation procedure is supported by tips and instructions in order to prevent errors.

Titration Center Technical Data

Titration Center

This center is your actual workplace. This is where you perform your daily jobs, i.e. where you select the methods, enter the sample identifications and weights and can see the results of the completely titrated samples. For proper configuration of the work lists, you have many different options at your disposal that provide you with a great deal of organisational scope as well. The details of the work list show the individual methods with the corresponding samples and their characteristics (sample identification, number, sample changer position, status, date, time, results, titration curve graphics and sensor characteristics). During the titration you can observe the titration process by means of an on-line curve. You can, however, simply allow the samples to be processed in the background and use your PC for other tasks or start an additional titration of another configuration on a parallel basis. When working with the sample changer TW *alpha*, you can adjust



various settings such as skipping over blank items, rinsing or waiting options. For the type and form of the documentation, which is in accordance with GLP and ISO 9000 directives, you have the possibility of printouts as

a table or list form with curves and in addition of preparing output files (ASCII) or integrating external documentation programs or LIMS export.

Technical data

The follow specifications are required to let you work quickly with TitrSoft 2.0 and achieve the best possible results

Interface	1 free serial RS-232-C interface per configuration mouse connection absolutely required
Computer	as from Pentium 133 MHz or higher
Operation system	WINDOWS 95, Windows NT (as from 4.0 or higher)
RAM	at least 32 MB
Fixed disk	at least 20 MB available memory capacity
Graphics card	resolution 800 x 600, at least 16 K colors
Printer	all types supported by Windows 95 and Windows NT

Ordering Information

TITRONIC® basic and TITRONIC® universal		TitroLine KF		TZ 2081, exchange unit 20 ml, complete (TitroLine <i>alpha</i>)	28 522 1828
TITRONIC <i>basic</i> , Module 1, 230 V	28 521 2572	TitroLine <i>KF</i> complete, 230 V	28 521 2248	TZ 2085, exchange unit 50 ml, complete (TitroLine <i>alpha</i>)	28 522 1852
TITRONIC <i>basic</i> , Module 1, 115 V	28 521 2564	TitroLine <i>KF</i> complete, 115 V	28 521 2231	TM 135,	
TITRONIC <i>basic</i> , Module 2, 230V, same as Modul 1, with magnetic stirrer TM 96	28 521 2823	TitroLine alpha		magnetic stirrer, 230 V (TitroLine <i>alpha</i>)	28 521 1013
TITRONIC <i>basic</i> , Module 2, 115 V	28 521 2572	TL 10, TitroLine <i>alpha</i> , 10 ml dosing unit	28 521 1716	TM 135,	
TITRONIC <i>universal</i> , 20 ml Module 1, 230 V	28 521 2429	10 ml dosing unit and BNC-plug	28 521 1765	magnetic stirrer, 115 V (TitroLine <i>alpha</i>)	28 521 1005
TITRONIC <i>universal</i> , 20 ml Module 1, 115 V	28 521 1921	TL 20, TitroLine <i>alpha</i> ,			
TITRONIC <i>universal</i> , 20 ml Module 2, 230 V, same as Module 1, with magnetic stirrer TM 96	28 521 2437	20 ml dosing unit	28 521 1724	TW alpha	
TITRONIC <i>universal</i> , 20 ml Module 2, 115 V	28 521 1962	TL 20-BNC, TL 20 with BNC-plug	28 521 1773	TW <i>alpha</i> ,	
TITRONIC <i>universal</i> , 50 ml Module 1, 230 V	28 521 2445	TL 50, TitroLine <i>alpha</i> , 50 ml dosing unit	28 521 1732	sample changer TW <i>alpha</i> basic unit, 230 V	28 521 5989
TITRONIC <i>universal</i> , 50 ml Module 1, 115 V	28 521 1979	TL 50-BNC, TL 50 with BNC-plug	28 521 1781	TW <i>alpha</i> ,	
TITRONIC <i>universal</i> , 50 ml Module 2, 230 V, same as Module 1, with magnetic stirrer TM 96	28 521 2494	TL KF 10, TitroLine <i>alpha</i> Karl Fischer Module, 10 ml dosing unit	28 521 1827	sample changer TW <i>alpha</i> basic unit, 115 V	28 521 5907
TITRONIC <i>universal</i> , 50 ml Module 2, 115 V	28 521 1987	TL KF 10-BNC, TLKF-10 with BNC plug	28 521 1868	TW <i>alpha</i> -16, sample changer TW <i>alpha</i> with turntable for 16 samples incl. titration head, connecting cable and 20 beakers, 150 ml 230V	28 521 6003
		Accessoires for TITRONIC® basic ,		TW <i>alpha</i> -16, 115 V	28 521 5923
		TITRONIC® universal , TitroLine easy , TitroLine KF and TitroLine alpha		TW <i>alpha</i> -24, sample changer TW <i>alpha</i> with turntable for 24 samples incl. titration head, connecting cable and 30 beakers, 50 ml, 230V	28 521 6011
TitroLine easy		TZ 2005, bottle top adapter, GL 45	28 522 1055	TW <i>alpha</i> -24, 115 V	28 521 5931
TitroLine <i>easy</i> Module 1 without Electrode, 230 V	28 521 2597	TZ 2008, bottle top adapter, S 40	28 522 1088	TW <i>alpha</i> -COD, sample changer TW <i>alpha</i> with turntable for COD samples incl. titration head, connecting cable , top stirrer,	
TitroLine <i>easy</i> Module 1 without Electrode, 115 V	28 521 2589	TZ 2007, bottle top adapter GL 45 + 1 L reagent bottle, clear	28 522 1071	Redoxelectrode, titration tip, 230V	28 521 6028
TitroLine <i>easy</i> Module 2 for pH-titration, 230 V, same as Modul 1, with a pH- electrode, puffer set	28 521 2848	TZ 2004, bottle top adapter GL 45 + 1 L reagent bottle, brown	28 522 1047	TW <i>alpha</i> -TP, sample changer TW <i>alpha</i> with turntable for 16 samples incl. peristaltic pump TP 20, titration head, connecting cable and 20 beakers, 150 ml, 230V	28 521 6036
TitroLine <i>easy</i> Module 2 for pH-titration, 115 V	28 521 2831	TZ 3460,		TW <i>alpha</i> -TP, 115 V	28 521 5956
TitroLine <i>easy</i> Module 3 for halogenide-titration, 230 V, same as Modul 1, with a silver combination electrode	28 521 2864	RS 232-printer including data cable, 230 V	28 522 5608	Accessoires for TW alpha	
TitroLine <i>easy</i> Module 3 for halogenide-titration, 115 V	28 521 2856	TZ 3465,		TZ 1847, top stirrer for 12, 16 and 24 turntables	28 521 5134
		RS 232-printer including data cable, 115 V	28 522 5657	TP 20, pump unit 230/ 115 V	28 521 2334
TitriSoft		TZ 2825,			
TZ 2071	28 522 1717	mini PC keyboard (only TitroLine <i>KF</i>)	28 521 2753		
		TZ 1052, KF drying oven, 230 V	28 521 4721		
		TZ 1055, KF drying oven, 115 V	28 521 5183		
		TZ 1050, accessoires for KF drying oven	28 521 8107		
		TZ 2080,			
		exchange unit holder (TitroLine <i>alpha</i>)	28 522 1803		
		TZ 2081, exchange unit 10 ml, complete (TitroLine <i>alpha</i>)	28 522 1811		