

Gebrauchsanleitung

**Titrationen-Probenwechsler
*TW alpha plus***

Operating Instructions

**Titration Sample Changer
*TW alpha plus***

Mode d'emploi

**Changeur d'échantillons
*TW alpha plus***



SCHOTT

Gebrauchsanleitung Seite 2 13

Wichtige Hinweise: Die Gebrauchsanleitung vor der ersten Inbetriebnahme des Titrations-Probenwechslers TW *alpha plus* bitte sorgfältig lesen und beachten. Aus Sicherheitsgründen darf der Titrations-Probenwechsler TW *alpha plus* ausschließlich nur für die in dieser Gebrauchsanleitung beschriebenen Zwecke eingesetzt werden.

Bitte beachten Sie auch die Gebrauchsanleitungen für die anzuschließenden Geräte.

Alle in dieser Gebrauchsanleitung enthaltenen Angaben sind zum Zeitpunkt der Drucklegung gültige Daten. Es können jedoch von SCHOTT sowohl aus technischen und kaufmännischen Gründen, als auch aus der Notwendigkeit heraus, gesetzliche Bestimmungen der verschiedenen Länder zu berücksichtigen, Ergänzungen am Titrations-Probenwechsler TW *alpha plus* vorgenommen werden, ohne dass die beschriebenen Eigenschaften beeinflusst werden.

Operating Instructions Page 14 26

Important notes: Before initial operation of the Titration Sample Changer TW *alpha plus* please read and observe carefully the operating instructions. For safety reasons the Titration Sample Changer TW *alpha plus* may only be used for the purposes described in these present operating instructions.

Please also observe the operating instructions for the units to be connected.

All specifications in this instruction manual are guidance values which are valid at the time of printing. However, for technical or commercial reasons or in the necessity to comply with the statutory stipulations of various countries, SCHOTT may perform additions to the Titration Sample Changer TW *alpha plus* without changing the described properties.

Mode d'emploi Page 27 39

Instructions importantes: Prière de lire et d'observer attentivement le mode d'emploi avant la première mise en marche du Changeur déchantillons de titration TW *alpha plus*. Pour des raisons de sécurité, le Changeur déchantillons de titration TW *alpha plus* pourra être utilisé exclusivement pour les usages décrits dans ce présent mode d'emploi.

Nous vous prions de respecter également les modes d'emploi pour les appareils à connecter.

Toutes les indications comprises dans ce mode d'emploi sont données à titre indicatif au moment de l'impression. Pour des raisons techniques et/ou commerciales ainsi qu'en raison des dispositions légales existantes dans les différents pays, SCHOTT se réserve le droit d'effectuer des suppléments concernant le Changeur d'échantillons de titration TW *alpha plus* pour séries de dilution qui n'influencent pas les caractéristiques décrits.

SCHOTT

TABLE OF CONTENTS	PAGE
1 TW <i>alpha plus</i> Titration Sample Changer	15
2 Set-up and initial operation.....	15
2.1 Unpacking the device.....	15
2.2 Warning and safety information	15
2.3 Rear view of the TW <i>alpha plus</i> Titration Sample Changer.....	16
2.4 System preparation	17
3 Sample plates of the TW <i>alpha plus</i> Titration Sample Changer	17
4 Built-in magnetic stirrer.....	18
5 I/O port of the TW <i>alpha plus</i> Titration Sample Changer	18
5.1 General I/O description	18
5.2 Electrical properties of the I/O port.....	18
5.3 Inputs of the I/O port.....	18
5.4 Outputs of the I/O port.....	19
5.5 The "Pump-Unit" port.....	19
6 Connection to a computerized titration system	19
6.1 Interface connections	19
6.2 Integration in a daisy-chain	19
6.3 Data-transfer parameters	20
7 Command list of the TW <i>alpha plus</i> Titration Sample Changer	21
8 Switch positions	24
8.1 Baud rate	24
8.2 Plate size	25
8.3 Address	25
9 Technical data	26

1 TW *alpha plus* Titration Sample Changer

The TW *alpha plus* Titration Sample Changer enables serial titrations with automatic sample changing. It can be used with all kinds of sampling which is done using open beaker glasses. Using a suitable titration head, it is possible to carry out COD titrations directly in reaction containers standardized in accordance with DIN 38 409, Part 41. The TW *alpha plus* Titration Sample Changer is controlled by a computer or by titrators via the RS-232-C interface. It is equipped with a built-in magnetic stirrer.

2 Set-up and initial operation

2.1 Unpacking the device

The TW *alpha plus* Titration Sample Changer was carefully tested and packed in the factory.

For the scope of delivery, please refer to the enclosed part list.

Please make sure to take out all parts from the packing.

The TW *alpha plus* Titration Sample Changer may be set up on any flat surface. Please plug the mains connection cable coming with the device to the cold-device plug (Europe-type integrated plug) at the back panel. Before switching on, please ensure that the device's operating voltage as set on the voltage-selector switch at the bottom of the device matches the mains voltage. The possible operating voltage range is shown on the type plate (please refer to the base plate). If the set operating voltage does not match the mains voltage, please contact your competent service department.

The TW *alpha plus* Titration Sample Changer is switched on using the mains switch located at the back panel, a green light at the front panel will indicate the "On" operating status.

Please do observe the warning and safety information.

2.2 Warning and safety information

For reasons of safety and functionality, the TW *alpha plus* Titration Sample Changer must only be opened by authorized persons; this means, e.g., that work on electrical features must only be performed by qualified staff. In the case of unauthorized intervention in the TW *alpha plus* Titration Sample Changer as well as in the case of negligent or deliberate damage, the warranty will become void.

The TW *alpha plus* Titration Sample Changer corresponds to Protection Class I. It was manufactured and tested according to DIN 57 411, Part 1/VDE 0411, Part 1, Protective Measures Applicable to Electronic Measurement Devices, and has left the factory in an impeccable condition as concerns safety technology. In order to maintain this condition and to ensure safe operation, the user should observe the notes and warnings contained in the present operating instructions.

Prior to switching the device on it has to be ensured that the operating voltage matches the mains voltage. The operating voltage is indicated on the type plate. The mains plug is to be plugged to a socket equipped with a protective contact. The protective effect must not be eliminated by an extension cord without protective contact. Any interruption of the protective lead inside or outside the device, or any loosening of the protective-lead connector may render the device hazardous. Intentional interruptions are inadmissible.

It has to be ensured that no fuses other than those of the specified type and with the nominal current strength are used. The use of mended fuses, or any short-circuiting of the fuse carrier is inadmissible.

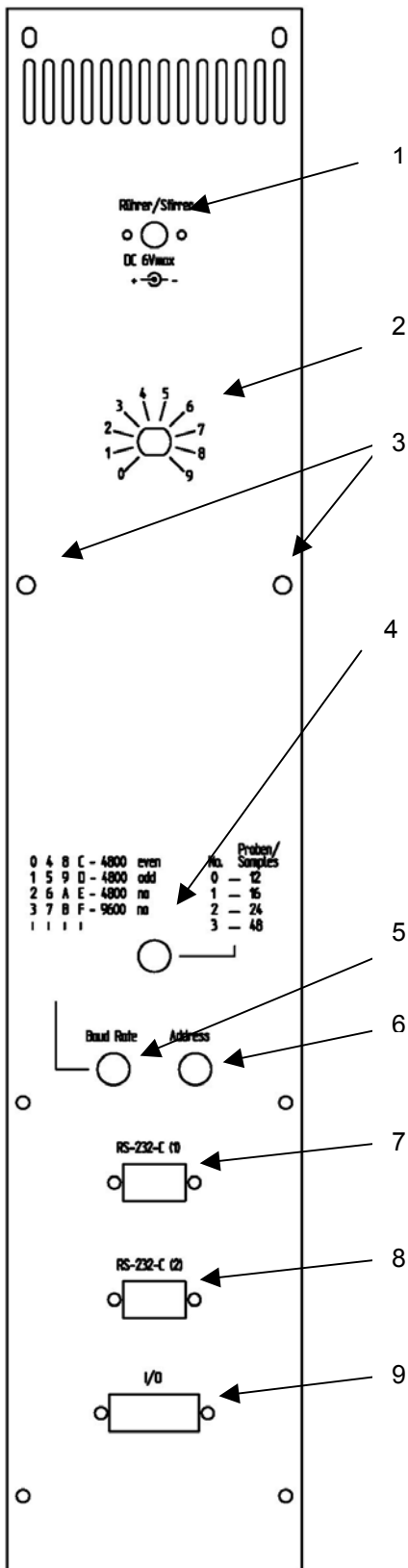
The built-in safety features must never be put out of operation.

For safety reasons the device must not be used for any purpose other than the one described in the present operating instructions.

The device must not be operated or stored in humid rooms.

Please observe also the operating instructions of any device to be connected.

2.3 Rear view of the TW *alpha plus* Titration Sample Changer



1 Stirrer port (low-voltage integrated plug, inner contact \varnothing 2.1 mm).

2 Setting of the stirring speed of the built-in magnetic stirrer

3 Fastening points for hose and cable carriers

4 Setting of sample plate size being used (please refer to chapter 8.2)

5 Multi-purpose switch for setting the baud rate, the mains frequency being applied, and the “normal” or “COD” sample containers being used (please refer to chapter 8.1)

6 Setting of the device address (please refer to chapter 8.3)

7 Connector for communication with computer and data communication with titrators, RS-232-C interface (1) 9-channel D sub miniature socket (please refer to chapter 6)

8 Connector for data communication with other peripherals within a daisy chain, RS-232-C interface (2) 9-channel D sub miniature socket (please refer to chapter 6)

9 Connector for pump and valve modules, 15-channel D sub miniature socket (please refer to chapter 5)

Moreover, the following operating elements are accessible from the back panel:

Type plate

Mains connector with fuse

Pump connector: Rinsing device

Mains switch

Fig. 1: Rear view of the TW *alpha plus* Titration Sample Changer

2.4 System preparation

Fitting of a hose carrier

Please use the enclosed knurled screws to attach the hose carrier to the bore holes provided for this purpose on the back panel.

When fastening the hoses and electrode cables afterwards, please avoid any kinking of the hoses and cables during this process.

Changing the stroke height

The ex-factory setting of the stroke height is approx. 130 mm (half of the travel). It is possible to mechanically change the stroke height using an internal switch. If very high containers are to be used, for instance, COD containers, the connection of the middle switch is to be interrupted.

If the stroke height is to be modified, the casing has to be opened in any case. To do so, please pull off the titration-head carrier, then remove the four screws along the front guidance key as well as the two upper and the two lateral ones at the bottom. After removing the entire enclosure, the middle switch can be found to the left of the guidance body.

Please note!! Do not change the setting of the upper limit switch since it is used to limit the travel.

Connection of a titration system

A data cable of the no. TZ 3084 type is used to connect the TW *alpha plus* Titration Sample Changer to a titration system, or with TZ 3088 directly to a computer. This is done using the upper of the 9-channel sockets on the back panel, i.e. the (1) RS-232-C data communication interface. For further information, please refer to chapter 6, "Connection to a computerized titration system".

Electrodes, titration tips, stirrer

The required electrodes and titration tips are to be inserted into the corresponding bore holes (NS 14,5) of the titration head, e.g. of the no. TZ 1463 type. If a stirrer is used, it should also be connected to one of the bore holes. The power supply of the stirrer is established via a cable which is to be attached to the titration head and leads to the "Rührer/Stirrer" socket at the back panel of the TW *alpha plus* Titration Sample Changer.

The stirring speed can be adjusted by software commands. The max. rps of the built-in magnetic stirrer can be limited using the potentiometer on the back panel. If you wish that the max. stirring speed be adjustable through an RS command, the potentiometer is to be set to stage 9.

3 Sample plates of the TW *alpha plus* Titration Sample Changer

Four sample plates are available for the TW *alpha plus* Titration Sample Changer:

TZ 1452 sample plate:	12 samples	250 ml low shape, 400 ml high shape
TZ 1459 sample plate:	16 samples	100 ml to 150 ml, high and low shape, 250 mm high shape
TZ 1454 sample plate:	24 samples	50 ml, high shape
TZ 1444 sample plate:	24 samples	COD reaction vessel according to DIN 38 409, Part 41
Sample plate	: 48 samples	Available as a special version upon request.

On the back panel of the TW *alpha plus* Titration Sample Changer there is a stage switch inscribed "Proben/Samples" (please refer to fig. 1, item 4). This switch is used to communicate the sample plates used to the TW *alpha plus* Titration Sample Changer. Using a small screw driver, this switch can be set to the corresponding size.

Here is:

- 0 = 12 samples
- 1 = 16 samples
- 2 = 24 samples
- 4 = 48 samples

This setting can also be made via software using the appropriate commands from a connected computer or titration device; please refer to chapter 7, "Command list of the TW *alpha plus* Titration Sample Changer".

The sample plates are set on clock-wise according to the mark engraved on the sample changer. The connection with the TW *alpha plus* Titration Sample Changer is made by simply placement on the corresponding driv-

ing cone. In this process, the sample plate is to be rotated until it latches. To remove the sample plate, just lift it a little bit up.

4 Built-in magnetic stirrer

The TW *alpha plus* Titration Sample Changer is equipped with a built-in magnetic stirrer.

If the TitroLine *alpha plus* Titrator or a PC Software is used, for instance, this stirrer can be switched on and off via the RS-232-C interface 1.

At the start of titration, the speed set in the method will be transferred. The stirrer will start running at that speed. When setting the stirring speed, please do not select any setting below 10 seconds.

If the stirring speed is to be controlled by the titrator, please make sure that the setting knob is set to full stirring speed, otherwise the max. possible stirring speed will be limited in accordance with the stage set on the setting knob. The desired stirring speed can then be fine-adjusted using the rotary knob on the back panel of the sample changer.

5 I/O port of the TW *alpha plus* Titration Sample Changer

5.1 General I/O description

The TW *alpha plus* Titration Sample Changer is equipped with a 15-channel plug connector for connecting pump and valve modules. This I/O port can be used to connect the available devices via a cable (fig. 1, item 9). This I/O port is controlled by the computer software. A total of 4 outputs and 5 inputs is available. For the required commands, please refer to the command list.

5.2 Electrical properties of the I/O port

The in- and outputs of the I/O port are galvanically isolated from the electronics of the titration sample changer by optocouplers of the HCPL-0700 type. No direct circuiting of power consumers is possible. The pump and valve modules available from SCHOTT-INSTRUMENTS can be connected directly to the I/O unit using a cable.

5.3 Inputs of the I/O port

A maximum current of 20 mA may be applied to the 4 inputs of the I/O port. An optocoupler of the HCPL-0700 type is being used. Circuiting has to be such that + 5V are applied to the common anode and the inputs can be activated by contact to ground. The pin configuration is shown in the list below:

Input	Pin number
1	1
2	2
3	3
4	4

Common anode (+ 5 V connection) 13

The statuses of the inputs can be inquired using the "aalP" command.

The answer is: "aal=10110000". The order of the zeroes and ones reflects the logic state of the inputs. The first digit is assigned to the first input. Only the four first bit are of any relevance; for system reasons, the last 4 bits are always 0.

5.4 Outputs of the I/O port

The outputs of the I/O port are configured as follows:

Output	Pin number
1	9
2	10
3	11
4	12
Common emitter	14 and 15
Common power supply	13

The supply voltage for the optocoupler outputs has to be made from an external source and amounts to between 1 and + 18 V. Max. output current of the HCPL-0700 optocoupler module: 60 mA.

5.5 The “Pump-Unit” port

This port, located on the back panel the device, is used to control a connected pump (e.g. of the no. TP 20 type) or valve. The built in relay is able to control a voltage of 220 V and a current of 2 A. The <aaCE> command will switch the port on, the <aaCA> will switch it off again. The <aaCS1..9> command will switch the port on for the specified time, with the number indicating the time in terms of seconds.

6 Connection to a computerized titration system

6.1 Interface connections

The TW *alpha plus* Titration Sample Changer is equipped with two serial interfaces (RS-232-C) for data communication with other devices. The plug connectors for these interfaces are located on the back panel of the device (fig. 1, items 7 and 8). The upper socket establishes the connection towards a computer, whereas the lower socket connects to other devices.

The transfer parameters can be set using the “Baud Rate” switch (fig. 1, item 5).

6.2 Integration in a daisy-chain

Using a device address will enable you to operate more than one titration devices in the form of a daisy-chain. To do so, use an RS-232-C cable to connect the computer with the first device in the chain (e.g. with a TITRONIC ® 110 plus Piston Burette). Using another cable, connect the second RS-232-C interface of the burette to the upper RS-232-C interface (1) of the TW *alpha plus* Titration Sample Changer. From the second (lower) RS-232-C interface (2) of the TW *alpha plus* Titration Sample Changer, it is possible to connect additional devices (fig. 1, items 7 and 8).

Please make sure that the devices in the chain have different addresses assigned. The device address of the TW *alpha plus* Titration Sample Changer can be set on the back panel of the device. The address range is from 00 to 15, depending on the 0 to F switch position.

Please note: When using the device with a TitroLine alpha plus Titrator, the sample changer must always be connected directly downstream of the titrator.

In this case the RS interface 2 of the TitroLine alpha plus Titrator is to be set to the 8; 1; no parameter record.

6.3 Data-transfer parameters

The transfer speed of the interfaces can be set using the "Baud Rate" switch (fig. 1, item 5). Except for the transfer speed, the following parameters are defaulted:

Number of data bits	= 7
Number of stop bits	= 2
parity check	= even, odd, no

The "Baud Rate" switch can be used to set a total of 2 different speeds:
4800 baud, 9600 baud.

The ex-factory setting of the baud rate is 4800.

In addition to the baud rate, this switch can be used to adapt the device to the mains frequency (50 Hz or 60 Hz) and to specify the use of a COD sample plate. The list below shows the details of the switch positions:

Switch Position	Meaning
0	4800 Baud / even Parity / 50 Hz / normal beaker glasses
1	4800 Baud / odd Parity / 50 Hz / normal beaker glasses
2	4800 Baud / no Parity / 50 Hz / normal beaker glasses
3	9600 Baud / no Parity / 50 Hz / normal beaker glasses
4	4800 Baud / even Parity / 60 Hz / normal beaker glasses
5	4800 Baud / odd Parity / 60 Hz / normal beaker glasses
6	4800 Baud / no Parity / 60 Hz / normal beaker glasses
7	9600 Baud / no Parity / 60 Hz / normal beaker glasses
8	4800 Baud / even Parity / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
9	4800 Baud / odd Parity / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
A	4800 Baud / no Parity / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
B	9600 Baud / no Parity / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
C	4800 Baud / even Parity / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41
D	4800 Baud / odd Parity / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41
E	4800 Baud / no Parity / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41
F	9600 Baud / no Parity / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41

When using the TW *alpha plus* Titration Sample Changer in combination with devices from SCHOTT Instruments, the baud rate is to be set to 4800 including the appropriate options (50 / 60 Hz, normal beaker glasses/COD reaction vessels).

Extract from the table:

Switch position	Meaning
2	4800 Baud / no Parity / 50 Hz / normal beaker glasses
6	4800 Baud / no Parity / 60 Hz / normal beaker glasses
A	4800 Baud / no Parity / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
E	4800 Baud / no Parity / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41

7 Command list of the TW *alpha plus* Titration Sample Changer

The TW *alpha plus* Titration Sample Changer features a set of commands which can be used to control it from connected devices. These commands are generated automatically by titrators from SCHOTT Instruments and the various titration systems. If you wish to create application programs of your own, please use the commands listed below.

All commands are present in the following form: Address (2 digits) command CR LF.

The address is used to address the proper device, since it is possible that more than one device having an addressable RS-232-C interface are connected to a computer. The addresses may be selected from 00 through 15. In the list below the addresses are indicated by the generalised "aa" form.

Command	Response	Reply from the TW <i>alpha plus</i>
aaGT	Query of the set plate size zz means any digits	aaPlatezz
aaKH	Lift titration head up to upper limit switch	aaY
aaKR	Lower titration head, if no beaker glass is present:	aaY aaERROR:KEIN BECHER (NO BEAKER)
aaKGzzz	Lower titration head by the specified percentage of the total travel (zzz = 1 to 100)	aaY
aaKUzzz	Raise titration head by the specified percentage of the total travel (zzz = 1 to 100)	aaY
aaDV	Rotate plate forwards by one position	aaY
aaDR	Rotate plate backwards by one position	aaY
aaDT	Move plate to next titration position (used following the "DCzz" command)	aaY
aaDPzz	Move plate to the indicated position (zz = 1 up to max plate position)	aaY
aaDCzz	Rotate plate to specified position. The initial position will be stored and serves as information for the next titration position (-> "aaDT" command) (zz = 1 to max. plate position)	aaY
aaPTNzz	Switch plate size to size specified in zz.. Stroke height for normal beaker height. (zz = 12; 16; 24; 48)	aaY
aaPTCzz	Switch plate size to size specified in zz.. Stroke height COD glasses.	aaY
aaPO	Output of current plate position	aaPOSITION= zz

Command	Response	Reply from the TW <i>alpha plus</i>
aaQE	The built-in stirrer port and the built-in stirrer will be switched on	aaY
aaQA	The built-in stirrer port and the built-in stirrer will be switched off	aaY
aaQSz	Setting the stirring speed (z = 0 bis 9)	aaY
aaRH	Device identification	aalident: TW280
aaON	witch all 4 outputs on	aaY
aaOJ	witch all 4 outputs off	aaY
aaOE1..4	Switch specified outputs on (1 to 4) Separate digits by ';', example: aaOE1;3;4	aaY
aaOA1..4	Switch specified outputs off (1 to 4) Separate digits by ';', example: aaOA1;2;3	aaY
aaOM1..4	The specified outputs will be monitored by the inputs specified in the "aaOI" command Separate digits by ';', example: aaOM2;4	
aaOI1..4	The selected outputs will switch off the inputs specified in the "aaOM" command if "low" status is present Separate digits by ';', example: aaOI3;4	aaY
aaOT	Monitoring of the inputs is switched on.	aaY
aaIP	Query of all inputs of the I/O port, only the 4 first digits are relevant	aal=10110000
aaWA	This command has no effect, but is continued for compatibility reasons	aakeine Daten
aaWO	This command has no effect, but is continued for compatibility reasons	aaY
aaVE	Query of the built-on software version number	aaVersion: MMM TT JJ
aaCA	The built-in Pump-Unit port is switched off	aaY
aaCE	The built-in pump unit is switched on	aaY
aaCS1..9	The built-in Pump-Unit port is switched on for the specified period of time (in s)	aaY

Command	Response	Reply from the TW <i>alpha plus</i>
aaRB	Check for presence of a beaker glass if no beaker glass is present:	aaY aaERROR:KEIN BECHER
aaRC	Repeat last command; however, the last command will not be executed again	„last command “
aaDQ	Rotate plate by one position, irrespective of the head position	aaY
aaSH	Immediate stop of all processes and movements	aaY
aaSC	Continue all processes and movements which were stopped with the aaSH command	aaY
aaSR	Immediate stop of all processes and movements; all processes and movements are reset to basic state	aaY
99AAzz	Serial numbering of all devices within the daisy-chain The first device in the chain will be assigned the zz address. The next following device will get the zz+1 address. If zz=15, the next device will be assigned the zz=1 address All devices respond with their new address	zzY
99AB..	Send any command to all devices all devices will respond to the command specified after <99AB> Example: 99ABVE will return the version numbers of all connected devices.	

8 Switch positions

8.1 Baud rate

The "Baud Rate" switch (fig. 1, item 5) is used to set the transfer speed, the mains frequency, and the beaker glasses being used. The switch position must only be changed if the TW *alpha plus* Titration Sample Changer is switched off. The mains frequency has an effect on the motional speed of the titration head. To ensure the proper control of the movements of the titration head by the software, the mains frequency has to be set correctly. The indication of "normal beaker glass", "COD reaction vessel" has an influence on the "Lower head" command: Since the COD reaction vessels are considerably higher than normal beaker glasses, the movement of the titration head has to stop earlier.

Switch position	Meaning
0	4800 Baud / even Parity / 50 Hz / normal beaker glasses
1	4800 Baud / odd Parity / 50 Hz / normal beaker glasses
2	4800 Baud / no Parity / 50 Hz / normal beaker glasses
3	9600 Baud / no Parity / 50 Hz / normal beaker glasses
4	4800 Baud / even Parity / 60 Hz / normal beaker glasses
5	4800 Baud / odd Parity / 60 Hz / normal beaker glasses
6	4800 Baud / no Parity / 60 Hz / normal beaker glasses
7	9600 Baud / no Parity / 60 Hz / normal beaker glasses
8	4800 Baud / even Parity / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
9	4800 Baud / odd Parity / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
A	4800 Baud / no Parity / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
B	9600 Baud / no Parity / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
C	4800 Baud / even Parity / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41
D	4800 Baud / odd Parity / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41
E	4800 Baud / no Parity / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41
F	9600 Baud / no Parity / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41

When using the TW *alpha plus* Titration Sample Changer in combination with the TitroLine *alpha plus* Titrator, the baud rate should normally be set to 4800. The list below gives the possible parameters of the mains frequency and the COD plates:

Switch position	Meaning
2	4800 Baud / 50 Hz / normal beaker glasses
6	4800 Baud / 60 Hz / normal beaker glasses
A	4800 Baud / 50 Hz / COD reaction vessels according to DIN 38 409, Part 41
E	4800 Baud / 60 Hz / COD reaction vessels according to DIN 38 409, Part 41

PLEASE NOTE: Considering that the position of this switch is only read in during power-up of the device, the sample changer is to be switched off prior to any change of the switch position, and to be switched on again after the position of the switch has been changed.

If the TitroLine *alpha plus* Titrator is connected upstream of the TW *alpha plus* Titration Sample Changer, please make sure that the parameter record 8,1,no is set on the RS 2 of the TitroLine *alpha plus*.

TitroLine <i>alpha plus</i>	TW <i>alpha plus</i>
8,1,no, 4800 baud	4800, no
7,1,even, 4800 baud	4800, even
8,1,no, 9600 baud	9600, no

8.2 Plate size

The plate size being used is set using the “Proben/Samples” switch (fig. 1, item 4) on the back panel of the TW *alpha plus* Titration Sample Changer. The switch has 16 positions, of which only the first 4 are in use. The switch positions have the following meaning:

Position	Number of samples
0	12
1	16
2	24
3	48

PLEASE NOTE: Considering that the position of this switch is only read in during power-up of the device, the sample changer is to be switched off prior to any change of the switch position, and to be switched on again after the position of the switch has been changed.

8.3 Address

The TW *alpha plus* Titration Sample Changer is equipped with an addressable serial interface. To make a clear distinction between all the connected devices, an address is preceding each command. This address is always made up of 2 digits and stretches in the range from 00 to 15. The address set using a correspondingly marked switch (fig. 1, item 6). The switch position correspond to the following addresses:

Position	Address
0	00
1	01
2	02
3	03
4	04
5	05
6	06
7	07
8	08
9	09
A	10
B	11
C	12
D	13
E	14
F	15

The “3” address is usually defaulted for operation with the TitroLine *alpha plus* Titrator.

PLEASE NOTE: Considering that the position of this switch is only read in during power-up of the device, the sample changer is to be switched off prior to any change of the switch position, and to be switched on again after the position of the switch has been changed.

9 Technical data

CE sign: **CE** EMC - Compatibility according to the directive 89/336/EEC of the Council;
 Interference emission according to the EN 61 326 standard, Part 1
 Jamming resistance according to the EN 61 326 standard, Part 2
 Low-voltage directive according to the Directive 73/23/EEC of the Council, in the version as
 last amended by the Directive 93/68/EEC of the Council
 Testing basis: EN 61 010, Part 1

Country of origin: Made in Germany

Automatic TW *alpha plus* Titration Sample Changer with interchangeable sample plates. Sample plates for 12, 24 beaker glasses or 24 COD reaction vessels according to DIN 38 409, Part 41. 48-type plates available as special make.

Stroke height: 270 mm, at delivery ex-factory limited to 130 mm

Beaker glasses for sample plates with 12 samples (* = preferred shape):	Order number of SCHOTT GLAS, MAINZ
250 ml with muzzle, low shape	21 106 36*
400 ml with muzzle, high shape	21 116 41
400 ml with muzzle, high shape	21 117 41

Beaker glasses for sample plates with 16 samples (* = preferred shape):	Order number of SCHOTT GLAS, MAINZ
100 ml with muzzle, low shape	21 106 24
150 ml with muzzle, low shape	21 106 29*
250 ml with muzzle, high shape	21 116 36
250 ml without muzzle, high shape	21 117 36

Beaker glasses for sample plates with 24 samples (* = preferred shape):	Order number of SCHOTT GLAS, MAINZ
50 ml with muzzle, high shape	21 116 17*
50 ml without muzzle, high shape	21 117 17

Materials:

Device: Casing made of two-component- coated ALU, steel sheet, and epoxy resin
 Sample plates: Stainless steel and ABS

Dimensions:

Device: 143 x 620 x 475 mm (W x H x D)
 Sample plates: Diameter 450 mm, H = 65 mm (for beaker glasses)
 H = 110 mm (for COD reaction vessels according to DIN 38 409, Part 41)

Connection values: 220 V, 30 VA
 110 V, 30 VA

Weight

Device: approx. 10,3 kg
 Sample plate with 12 beaker glasses 250 ml: approx. 2,7 kg
 Sample plate with 16 beaker glasses 150 ml: approx. 2,6 kg
 Sample plate with 24 beaker glasses 50 ml: approx. 2,4 kg
 Sample plate with 24 reaction vessels: approx. 6,3 kg

Typ / Type / Type / Tipo: TW alpha plus

Bescheinigung des Herstellers

Wir bestätigen, dass das oben genannte Gerät gemäß DIN EN ISO 9001, Absatz 8.2.4 "Überwachung und Messung des Produkts" geprüft wurde und dass die festgelegten Qualitätsanforderungen an das Produkt erfüllt werden.

Supplier's Certificate

We certify that the equipment was verified according DIN EN ISO 9001, part 8.2.4 "Monitoring and measurement of product" and that the specified requirements for the product are met.

Certificat du fournisseur

Nous certifions que le produit a été vérifié selon DIN EN ISO 9001, partie 8.2.4 "Surveillance et mesure du produit" et que les exigences spécifiées pour le produit sont respectées.

SCHOTT Instruments GmbH
Postfach 2443
D-55014 Mainz
Hattenbergstraße 10
D-55122 Mainz

Telefon +49 (0) 6131 66-5111
Telefax +49 (0) 6131 66-5001
E-Mail: titration@schottinstruments.com
www.schott-instruments.com

SCHOTT