

4.6 TitroLine® 7800 - The universal titrator with IDS technology

The TitroLine® 7800 enhanced the universal features of the TitroLine® 7750 with an additional IDS measurement input. Hence the TitroLine® 7800 is able to perform potentiometric titrations with analogue or IDS electrodes up to volumetric Karl Fischer titrations. The IDS measuring input is multifunctional. Digital sensors for the determination of pH and ORP value, the conductivity up to the dissolved oxygen can be connected.

IDS stands for „intelligent, digital sensors“ and means that the analog measuring signal is converted into a digital measuring value in the sensor. This protects the signal from external interferences, such as moisture, electro-magnetic fields or pulses. The higher measuring accuracy raises confidence in your readings to a whole new level.

- ▶ Highly visible full color display, that can be easily viewed from a distance and extreme angles
- ▶ With new interchangeable modules which all relevant reagent and unit data can be stored
- ▶ Expandable thanks to the 2 x USB-host, 1 x USB-PC, 1 LAN and 2 x RS232 ports. Connectable are e.g. USB keyboard, USB printer, barcode reader, USB flash drives, balances, PC and further SI Analytics devices such as piston burettes and sample changers
- ▶ Storage of results using via USB port (PDF - and CSV -format) including method transfer
- ▶ With standard methods for potentiometric and KF titration
- ▶ Second digital measuring port for intelligent digital sensors (IDS)

Benefits
TitroLine® 7800

Titration/Burettes

TitroLine® 7800 with accessories



TitroLine® 7800 – Featuring enhanced automation and additional methods

Besides the high specification of the overall series, the TitroLine® 7750 & 7800 models provide even more functions.

Measurement and calibration with the highest accuracy

The wireless sensor recognition automatically recognizes SI Analytics ID and IDS electrodes which instantly send the specific data to the titrator. Therefore TitroLine® 7800 always uses correct calibration data. Erroneous measurements are eliminated.



Rear panel

Ideal for measurements and titration tasks with pH and Conductivity

The TitroLine® 7800 is ideally suited for use in water analysis. A typical example is the measuring of the pH and conductivity. Subsequently, as a rule the Alkalinity or Carbonate/Hydrogen carbonate hardness is determined.

Conductivity and temperature are measured immediately after the two measuring electrodes are immersed in the sample. This will take a few seconds. Then the pH value is determined by drift control. This can take more than a minute for low-ion water samples. There is no mutual influence on the pH and the LF value due to the use of the digital conductivity electrode. The acid capacity $KS_{8.2}$ and $KS_{4.3}$ are then titrated with hydrochloric acid 0.02-0.1 mol / l. The titration is carried out to a pH of 4.3 (4.5) and the consumption is determined at pH 8.2 and 4.3 (or 4.5).

End of titration 1 of 4	
Alkalinity (p+m) - Probe	
EP1	0.000 ml / pH 8.200
p-value	0.00 mmol/l
EP2	2.178 ml / pH 4.300
m-value	2.18 mmol/l
next Page	
Back	
MODE	
ESC	

End of titration 2 of 4	
Alkalinity (p+m) - Probe	
Start pH (A)	pH 7.429
Start tempe...	22.7 °C
Start cond. ...	357.2 µS/cm
Start tempe...	22.7 °C
next Page	
Back	
MODE	
ESC	

This application is very easy to automate with a sample changer. If many samples have to be measured per day, the TW 7400-42 or the TW 7400-48 are used. It is also possible to calibrate the pH electrode in the sample changer at startup.



4.7 Specifications – Piston burette TITRONIC® 500

and titrators TitroLine® 7000/7500/7750/7800

Features	TITRONIC® 500	TitroLine® 7000	TitroLine® 7500 KF	TitroLine® 7500 KF trace	TitroLine® 7750	TitroLine® 7800
Display	Color online graphic	Color online graphic	Color online graphic	Color online graphic	Color online graphic	Color online graphic
Measuring input 1 pH/mV with reference input	—	■	—	—	■	■
Measuring input 2 digital (IDS)	—	—	—	—	—	■
Wireless electrode recognition	—	■	—	—	■	■
Measuring input Dead stop (2 x 4 mm connector)	—	■	■	■	■	■
Measuring input generator electrode (2 x 4 mm connector)	—	—	—	■	—	—
Measuring input temperature (2 x 4 mm connector)	—	■	—	—	■	■
Interfaces	1 x LAN, 2 x USB-A, 1 x USB-B 2 x RS 232	1 x LAN, 2 x USB-A, 1 x USB-B 2 x RS 232	1 x LAN, 2 x USB-A, 1 x USB-B 2 x RS 232	1 x LAN, 2 x USB-A, 1 x USB-B 2 x RS 232	1 x LAN, 2 x USB-A, 1 x USB-B 2 x RS 232	1 x LAN, 2 x USB-A, 1 x USB-B 2 x RS 232
Balance connection	RS232	RS232	RS232	RS232	RS232	RS232
Printer (USB-A)	HP PCL, Seiko DPU S445, PDF	HP PCL, Seiko DPU S445, PDF	HP PCL, Seiko DPU S445, PDF	HP PCL, Seiko DPU S445, PDF	HP PCL, Seiko DPU S445, PDF	HP PCL, Seiko DPU S445, PDF
Intelligent interchangeable modules (5, 10, 20 and 50 ml)	■	■	■	—	■	■
Burette solution (steps)	20,000	20,000	20,000	—	20,000	20,000
Manual titration	■	■	—	—	■	■
Dosing applications	■	■	■	—	■	■
Solution preparation (manual or automatic when connected to balance)	■	■	■	—	■	■
Automatic Titration (Independent without external software)	1)	■	■	■	■	■
Titration to mV and pH end points	—	2 EP	—	—	2 EP	2 EP
Dynamic and linear titration to inflection points (EQ) mV and pH	—	2 EQ	—	—	2 EQ	2 EQ
Particularly suitable for non aqueous titrations	—	■	—	—	■	■
Dead-stop-titration	—	■	■	—	■	■
pH-stat-titration	—	■	—	—	■	■
Water determination according to KF volumetry (10 ppm – 100 %, recommended)	—	—	■	—	■	■
Accuracy volumetric Measurements	—	—	< 0.3% at ≥ 10mg H ₂ O	—	< 0.3% at ≥ 10mg H ₂ O	< 0.3% at ≥ 10mg H ₂ O
Water determination according to KF coulometry (1 ppm – 5 %, recommended)	—	—	—	■	—	—
Accuracy coulometric Measurements	—	—	—	< 0.3% at ≥ 10mg H ₂ O	—	—
Standard methods	■	■	■	■	■	■
Number of user methods	15	50	50	50	50	50
Connection and control of autosamplers	—	■	—	—	■	■
Controlable via TitrSoft 3.3 and higher	■	■	■	■	■	■

1) Can be used as titration and dosing burette in automatic titration systems

Specifications – Piston burette TITRONIC® 500

and TitroLine® 7000/7500/7500/7750/7800

Features	TITRONIC® 500	TitroLine® 7000	TitroLine® 7500 KF	TitroLine® 7500 KF trace	TitroLine® 7750	TitroLine® 7800
Analogue measuring inputs						
Measuring input 1 (analog) pH/mV with reference electrode input	—	pH/mV-input with 24 bit transducer Electrode socket according to DIN 19 262 or additional with BNC socket insert RFID receiver for SI Analytics ID electrodes	—	—	pH/mV-input with 24 bit transducer Electrode socket according to DIN 19 262 or additional with BNC socket insert RFID receiver for SI Analytics ID electrodes	pH/mV-input with 24 bit transducer Electrode socket according to DIN 19 262 or additional with BNC socket insert RFID receiver for SI Analytics ID electrodes
Measuring range pH	—	-3.0 to 18.00	—	—	-3.0 to 18.00	-3.0 to 18.00
Display resolution pH / Accuracy pH (without sensor probe)	—	0.001 / 0.002 ± 1 Digit	—	—	0.001 / 0.002 ± 1 Digit	0.001 / 0.002 ± 1 Digit
Measuring range mV	—	-2000 to 2000	—	—	-2000 to 2000	-2000 to 2000
Display resolution mV / Accuracy mV (without sensor probe)	—	0.1 / 0.1 ± 1 Digit	—	—	0.1 / 0.1 ± 1 Digit	0.1 / 0.1 ± 1 Digit
Analogue measuring inputs - Dead Stop						
Measuring input Dead stop (2 x 4 mm socket)	—	Connector (µA) for double platinum electrodes Polarisation voltage adjustable from 40 to 220 mV	Connector (µA) for double platinum electrodes Polarisation voltage adjustable from 40 to 220 mV	Connector (µA) for double platinum electrodes	Connector (µA) for double platinum electrodes Polarisation voltage adjustable from 40 to 220 mV	Connector (µA) for double platinum electrodes Polarization voltage adjustable from 40 to 220 mV
Display resolution µA / Accuracy µA (without sensor probe)	—	0.1 / 0.2 ± 1 Digit	0.1 / 0.2 ± 1 Digit	—	0.1 / 0.2 ± 1 Digit	0.1 / 0.2 ± 1 Digit
Measuring input temperature (2 x 4 mm socket)	—	Connector for Pt 1000 / NTC 30kΩ	—	—	Connector for Pt 1000 / NTC 30kΩ	Connector for Pt 1000 / NTC 30kΩ
Measuring range temperature °C	—	Pt 1000: -75 to 195 / NTC 30kΩ -40...125°C	—	—	Pt 1000: -75 to 195 / NTC 30kΩ -40...125°C	Pt 1000: -75 to 195 / NTC 30kΩ -40...125°C
Display resolution °C / Accuracy °C (without sensor probe)	—	0.1 / Pt 1000: 0.2 K ± 1 Digit NTC 30kΩ: 1.0 K (-40...0°C)/0.3 K (0...125 °C) ± 1 Digit	—	—	0.1 / Pt 1000: 0.2 K ± 1 Digit NTC 30kΩ: 1.0 K (-40...0°C)/0.3 K (0...125 °C) ± 1 Digit	0.1 / Pt 1000: 0.2 K ± 1 Digit NTC 30kΩ: 1.0 K (-40...0°C)/0.3 K (0...125 °C) ± 1 Digit
Digital measuring inputs						
Measuring input 2 (IDS)	—	—	—	—	—	Accuracy ± 1 Digit depending on the used IDS electrode
Messbereich pH	—	—	—	—	—	0.000 to 14.000 ± 0.004 pH
Messbereich mV	—	—	—	—	—	± 1200.0 mV ± 0.2 mV
Messbereich Temperatur °C	—	—	—	—	—	-5.0 ... 105.0 °C ± 0.2 mV
Messbereich Leitfähigkeit	—	—	—	—	—	0.00 ... 2000 mS/cm ± 0.5% v. Mw.
Display	3.5 inches -1/4 VGA TFT display with 320 x 240 pixels	3.5 inches -1/4 VGA TFT display with 320 x 240 pixels	3.5 inches -1/4 VGA TFT display with 320 x 240 pixels	3.5 inches -1/4 VGA TFT display with 320 x 240 pixels	3.5 inches -1/4 VGA TFT display with 320 x 240 pixels	3.5 inches -1/4 VGA TFT display with 320x240 pixels
Housing material	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene
Front keyboard	Polyester coated	Polyester coated	Polyester coated	Polyester coated	Polyester coated	Polyester coated
Housing dimensions	15.3 x 45 x 29.6 cm (W x H x D), height with interchangeable unit	15.3 x 45 x 29.6 cm (W x H x D), height with interchangeable unit	15.3 x 45 x 29.6 cm (W x H x D), height with interchangeable unit	15.3 x XX x 29.6 cm (W x H x D)	15.3 x 45 x 29.6 cm (W x H x D), height with interchangeable unit	15.3 x 45 x 29.6 cm (W x H x D), height with interchangeable unit
Weight	2.2 kg for basic unit 3.5 kg for complete device incl. interchangeable unit (with empty reagent bottle, without magnetic stirrer)	2.3 kg for basic unit 3.5 kg for complete device incl. interchangeable unit (with empty reagent bottle, without magnetic stirrer)	2.3 kg for basic unit 3.5 kg for complete device incl. interchangeable unit (with empty reagent bottle, without magnetic stirrer or TM 235 KF)	2.3 kg for basic unit without magnetic stirrer TM 235 or TM 235 KF	2.3 kg for basic unit 3.5 kg for complete device incl. interchangeable unit (with empty reagent bottle, without magnetic stirrer or TM 235 KF)	2.3 kg for basic unit 3.5 kg for complete device incl. interchangeable unit (with empty reagent bottle, without magnetic stirrer)
Ambient conditions	Ambient temperature: +10 to +40 °C for operation and storage	Ambient temperature: +10 to +40 °C for operation and storage	Ambient temperature: +10 to +40 °C for operation and storage	Ambient temperature: +10 to +40 °C for operation and storage	Ambient temperature: +10 to +40 °C for operation and storage	Ambient temperature: +10 to +40 °C for operation and storage
Material: intelligent interchangeable units (5, 10, 20 and 50 ml)	Valve: PTFE/ETFE Cylinder: borosilicate glass 3.3 (DURAN®) Hoses: FEP, blue	Valve: PTFE/ETFE Cylinder: borosilicate glass 3.3 (DURAN®) Hoses: FEP, blue	Valve: PTFE/ETFE Cylinder: borosilicate glass 3.3 (DURAN®) Hoses: FEP, blue	—	Valve: PTFE/ETFE Cylinder: borosilicate glass 3.3 (DURAN®) Hoses: FEP, blue	Valve: PTFE/ETFE Cylinder: borosilicate glass 3.3 (DURAN®) Hoses: FEP, blue
Dosing accuracy according DIN EN ISO 8655, part 3	Accuracy : 0.15 % Precision: 0.05–0.07 % (Depending on the used interchangeable unit)	Accuracy : 0.15 % Precision: 0.05–0.07 % (Depending on the used interchangeable unit)	Accuracy : 0.15 % Precision: 0.05–0.07 % (Depending on the used interchangeable unit)	—	Accuracy : 0.15 % Precision: 0.05–0.07 % (Depending on the used interchangeable unit)	Accuracy : 0.15 % Precision: 0.05–0.07 % (Depending on the used interchangeable unit)

4.8 Ordering information: TITRONIC® 500, TitroLine® 7000/7500/7750/7800

Type No.	Order No.	Description
T 500	285220200	TITRONIC® 500 basic unit without magnetic stirrer, with stand rod and titration clamp Z 305, controller TZ 3880, power supply 100-240 V
T 500-M1	285220210	TITRONIC® 500 basic unit with magnetic stirrer TM 235, with stand rod TZ 1510, electrode clamp Z 305, hand controller TZ 3880, power supply 100-240 V
T 500-M2/20	285220220	TITRONIC® 500 basic unit with magnetic stirrer TM 235 and 20 ml exchange unit WA 20, with stand rod TZ 1510, electrode clamp Z 305, hand controller TZ 3880, power supply 100-240 V
TL 7000	285220100	TitroLine® 7000 basic unit without magnetic stirrer, with stand rod and titration clamp Z 305, power supply 100-240 V
TL 7000-M1/10	285220140	TitroLine® 7000 basic unit with magnetic stirrer TM 235 and 10 ml exchangeable unit WA 10, with brown glass bottle for titrant, GL 45 and S 40-bottle adapter, tubes, drip tube and titration tip
TL 7000-M1/20	285220150	TitroLine® 7000 basic unit with magnetic stirrer TM 235 and 20 ml exchangeable unit WA 20, with brown glass bottle for titrant, GL 45 and S 40-bottle adapter, tubes, drip tube and titration tip
TL 7000-M1/50	285220160	TitroLine® 7000 basic unit with magnetic stirrer TM 235 and 50 ml exchangeable unit WA 50, with brown glass bottle for titrant, GL 45 and S 40-bottle adapter, tubes, drip tube and titration tip
TL 7000-M2/20	285220170	TitroLine® 7000 basic unit with magnetic stirrer TM 235 and 20 ml exchangeable unit WA 20, with brown glass bottle for titrant, GL 45 and S 40-bottle adapter, tubes, drip tube and titration tip. With pH-combination electrode and buffer set.
TL 7000-TitriSoft	285220960	basic unit with magnetic stirrer TM 235, with stand rod and titration clamp Z 305, power supply 100-240 V, software TitriSoft 3.3 (TZ 3071)
TL 7500 KF 05	285220810	Volumetric KF-Titrator, scope of supply: basic titrator unit, exchange unit WA 05, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1770, micro double platinum electrode KF 1100 and starter kit, power supply 100-240 V
TL 7500 KF 10	285220820	Volumetric KF-Titrator, scope of supply: basic titrator unit, exchange unit WA 10, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1770, micro double platinum electrode KF 1100 and starter kit, power supply 100-240 V
TL 7500 KF 20	285220830	volumetric KF-Titrator, scope of supply: basic titrator unit, exchange unit WA 20, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1770, micro double platinum electrode KF 1100 and starter kit, power supply 100-240 V
TL 7500 KF trace M1	285220860	Module 1, coulometric KF-Titrator, scope of supply: basic titrator unit, generator electrode TZ 1752 without junction + connection cable, magnetic stirrer TM 235, stand rod, titration vessel TZ 1751, micro double platinum electrode KF 1150
TL 7500 KF trace M2	285220870	Module 2, coulometric KF-Titrator, scope of supply: basic titrator unit, generator electrode TZ 1752 without junction + connection cable, TM 235 KF titration stand with integrated stirrer and pump, stand rod, titration vessel TZ 1754, micro double platinum electrode KF 1150
TL 7500 KF trace M3	285220880	Module 3, coulometric KF-Titrator, scope of supply: basic titrator unit, generator electrode TZ 1753 with junction + connection cable, magnetic stirrer TM 235, stand rod, titration vessel TZ 1751, micro double platinum electrode KF 1150
TL 7500 KF trace M4	285220890	Module 4, coulometric KF-Titrator, scope of supply: basic titrator unit, generator electrode TZ 1753 with junction + connection cable, TM 235 KF titration stand with integrated stirrer and pump, stand rod, titration vessel TZ 1754, micro double platinum electrode KF 1150
TL 7500 KF trace M5	285221000	Module 5, coulometric KF-Titrator, scope of supply: basic titrator unit, generator electrode TZ 1752 without junction + connection cable, magnetic stirrer TM 235, stand rod, titration vessel TZ 1754, micro double platinum electrode KF 1150
TL 7750	285220240	Basic unit without magnetic stirrer, with stand rod; TZ 1510, electrode clamp Z 305, hand controller TZ 3880, power supply 100-240 V
TL 7750-M1	285220250	Basic unit with magnetic stirrer TM 2325, with stand rod; TZ 1510, electrode clamp Z 305, hand controller TZ 3880, power supply 100-240 V
TL 7750 KF 05	285220930	TitroLine® 7750 with KF accessories, scope of supply: basic titrator unit, exchange unit WA 05, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1770, micro double platinum electrode KF 1100 and starter kit, power supply 100-240 V
TL 7750 KF 10	285220940	TitroLine® 7750 with KF accessories, scope of supply: basic titrator unit, exchange unit WA 10, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1770, micro double platinum electrode KF 1100 and starter kit, power supply 100-240 V
TL 7750 KF 20	285220950	TitroLine® 7750 with KF accessories, scope of supply: basic titrator unit, exchange unit WA 20, TM 235 KF titration stand with integrated stirrer and pump, titration vessel TZ 1770, micro double platinum electrode KF 1100 and starter kit, power supply 100-240 V
TL 7750-TitriSoft	285220970	basic unit with magnetic stirrer TM 235, with stand rod and titration clamp Z 305, power supply 100-240 V, software TitriSoft 3.3 (TZ 3071)
TL 7800	285220980	TitroLine® 7800 basic unit with two measuring inputs, one analogue and one digital (IDS) measuring input
TL 7800-M1	285220990	TitroLine® 7800 basic unit with two measuring inputs, one analogue and one digital (IDS) measuring input, with magnetic stirrer TM 235
TL 7800-TitriSoft	285221030	basic unit with two measuring inputs, one analogue and one ein digital (IDS) measuring input, with magnetic stirrer TM 235 and TitriSoft 3.2

Accessories for TITRONIC® 500, TitroLine® 7000/7500/7750/7800

Type No.	Order No.	Description
WA 05	285220300	5 ml exchangeable unit with integrated chip for reagent data, with brown glass bottle for titrant, GL 45 and S 40-bottle adapter, tubes, drip tube and titration tip
WA 10	285220310	10 ml exchangeable unit with integrated chip for reagent data, with brown glass bottle for titrant, GL 45 and S 40-bottle adapter, tubes, drip tube and titration tip
WA 20	285220320	20 ml exchangeable unit with integrated chip for reagent data, with brown glass bottle for titrant, GL 45 and S 40-bottle adapter, tubes, drip tube and titration tip
WA 50	285220350	50 ml exchangeable unit with integrated chip for reagent data, with brown glass bottle for titrant, GL 45 and S 40-bottle adapter, tubes, drip tube and titration tip
TM 235, 115-230 V	285220400	Magnetic stirrer for vessels up to 500 ml, agitator speed infinitely adjustable from 500 - 2000 r/min, for the connection to TitroLine® 6000/7000 and TITRONIC® 500
TM 235 KF, 115-230 V	285220900	Titration stand with pump; Scope of delivery: Basic unit with 1 l DURAN®-reagent bottle TZ 1791, 1 l DURAN®-waste bottle TZ 1792, moisture bottle, tubes and screw threads, power supply TZ 1855 (110 to 240 V)
TZ 1052	285214721	KF-drying stove, 230 V
TZ 1055	285215183	KF-drying stove, 115 V
TZ 1060	285218115	Accessories set for KF drying stove TZ 1052/TZ1055
TZ 1065	285201973	Flowmeter with valve and hose connectors for gas volumes (air, nitrogen) from 50 - 500 ml/min.
KF 1100	285102030	Micro double platinum electrode for Karl Fischer titrations, with fixed cable, double platinum pin and tapper NS 7.5 for TZ 1770 and TZ 1772
TZ 1748	285216560	Stand rod stainless steel Ø 10 mm
TZ 1770	285216677	Karl Fischer titration vessel. DURAN® glass vessel TZ 1775 (approx. 30...150 ml), removable head made of polypropylene/ PTFE, 1 drilling NS 19, NS 14,5, NS 7,5 and 3 drillings with screw threads, titration tip, moisture trap and weighing funnel
TZ 1789	285221120	Starter kit KF consisting of molecular sieve, needles with syringes and glass wool
TZ 3863	285220480	USB-thermo printer, 112 mm for TitroLine® 6000/7000/7500 KF/7500 KF trace/7750 and TITRONIC® 500
TZ 3864	285220710	Thermal paper for TZ 3863 with very high durability (5 rolls)
TZ 3865	285220440	DIN A4 standard printer, HP PCL-compatible, with USB-connection cable, 230 V

5.1 TW alpha plus and TW 7400

The number of samples to be processed is growing constantly while at the same time the demands on reliability are increasing in accordance with GLP and ISO 900X standards. The TW *alpha* plus and the TW 7400 sample changers by SI Analytics helps you meet these increased requirements and relieve qualified employees from routine work.

Control by titrator or by PC

You can control the sample changer from the TitroLine® 7000/7750/7800 titrator or from a PC with the TitrSoft software.

Higher flexibility due to exchangeable sample racks

With four sample racks for up to 72 samples (TW 7400) and titration head fittings for a variety of beaker and titrator vessels you get the flexibility your lab needs. The sample racks and titrator heads are very quick and simple to change. The size of the rack can be selected in the TitroLine® 7000/7750/7800 or in the Titration Center of the TitrSoft software.

Stirring from "above" or "below"

As standard, the TW *alpha* plus comes with an integrated magnetic stirrer to stir the samples from "below". Alternatively, you can use a rod stirrer which enables stirring from "above". TW 7400 always stirs from "above".



TW alpha plus with 16 sample dish and pump MP 25

sample changer - automatic titration in series

Washing the electrode and the titration tip

To ensure accuracy of the results, the electrodes and the titration tips are rinsed after each titration. This can, for example, be done by immersing the electrodes and titration tips into a washing solution. The number of rinsing positions to be used (up to a maximum of three) and the rinsing time are set in the method. Direct and fast rinsing of the electrodes and titration tips can be ensured by using the MP 25 washing unit that rinses directly after the titration. In addition to this, a waiting position may also be used for example to immerse the pH electrodes into a KCl solution.

TW alpha plus with sample dish for COD vessels after DIN



Automatic COD Titration

For the direct titration of the COD there is a special sample tray for TW alpha plus with 24 positions available.



5.2 For large sample throughput - TW 7400 sample changer

The new X / Y sample changer TW7400 has been developed for high sample throughput. There are three different sample rack sizes of 42, 48 and 72 positions, and three different titration heads available.

Both the sample racks and the titration heads are easily exchanged. The sample rack with the 42 positions can be operated with beakers of either 150 or 250ml volume. These are used in particular in the water and environmental analysis. With this sample rack the use of the irrigation pump MP 25 is recommend. The sample rack with 72 positions can be operated with beakers of 50ml and special sample containers for a sample volume up to approximately 75ml. Typical applications include e.g. the wine and beverage analysis, pH measurements in soil samples or the determination of the alkalinity in Seawater.

The sample with 48 positions is suitable for 100ml beakers especially used for wine analysis.

Selection table autosampler TW *alpha* plus and TW7400

Feature/Accessory	TW <i>alpha</i> plus	TW 7400
Stirring from the bottom with built-in magnetic stirrer	■	—
Rod stirrer TZ 1847	■	■
Suitable for all sample racks besides COD	■	—
Rod stirrer TZ 1846	■	—
Suitable only for COD sample rack	■	—
Rinsing pump MP 25.	■	■
Suitable for sample racks: TZ 1452, TZ 1459 und TZ 3942	■	■
Sample rack for 12 positions TZ 1452	■	—
Suitable for titration vessel 250 ml low form (scope of supply) and 400 ml tall form	■	—
Sample rack for 12 positions TZ 1453	■	—
Suitable for titration vessel 600 ml tall form TZ 1766	■	—
Sample rack for 16 positions TZ 1457	■	—
Suitable for titration vessel 100 ml tall form (scope of supply)	■	—
Sample rack for 16 positions TZ 1459	■	—
Suitable for titration vessel 150 ml low form (scope of supply) and 250 ml tall form	■	—
Sample rack for 16 positions TZ 1458	■	—
Suitable for 100 ml laboratory bottles TZ 1494	■	—
Sample rack for 24 positions TZ 1454	■	—
Suitable for titration vessel 50 ml tall form (scope of supply) and titration vessel up to 75 ml sample volume (TZ 1786) and titration vessel TZ 3973 (PP)	■	—
Sample rack for 24 positions TZ 1444	■	—
Suitable for COD sample vessel 100 ml according to DIN (not included in scope of supply!)	■	—
Titration head TZ 1463 with 7 openings NS 14	■	—
Suitable for sample rack TZ 1459 and TZ 1452	■	—
Titration head TZ 1464 with 4 openings NS 14, splash	■	—
Suitable for sample rack TZ 1457 and TZ 1459	■	—
Titration head TZ 1467 with 7 openings NS 14, splash shield and rinsing spray	■	—
Suitable for sample rack TZ 1459 and TZ 1452 in combination with rinsing pump MP 25	■	—
Micro-titration head TZ 1469 with 4 openings	■	—
Suitable for sample rack TZ 1454	■	—
COD titration head TZ 1461 with 3 openings	■	—
Suitable for COD sample rack TZ 1444.	■	—
Sample rack for 42 position TZ 3942	—	■
Suitable for titration vessel 150 ml low form (scope of supply) and 250 ml tall form	—	■
Sample rack for 48 positions TZ 3948	—	■
Suitable for titration vessel 100 ml tall form (scope of supply)	—	■
Sample rack for 72 positions TZ 3972	—	■
Suitable for titration vessel 50 ml tall form (scope of supply) and titration vessel for up to 75 ml sample volume (TZ 1786)	—	■
Titrierkopf TZ 3963 with 7 openings NS 14	—	■
Suitable for sample rack TZ 3942	—	■
Titration head TZ 3967 with 7 openings NS 14, splash shield and rinsing spray	—	■
Suitable for sample rack TZ 3942 in combination with rinsing pump MP 25	—	■
Micro-titration head TZ 3969 with 4 openings	—	■
Suitable for sample rack TZ 3948 and TZ 3972	—	■
Important note: The rinsing pump MP 25 can only be used in combination with the titration heads TZ 1467, TZ 3967 and the sample rack TZ 1452, TZ 1459 and TZ 3942.		



TW 7400 with 42 position sample rack



TW 7400 with 48 position sample rack



TW 7400 with 72 position sample rack

5.3 Ordering information: Sample changer TW *alpha* plus and TW7400

Type No.	Order No.	Description
TW alpha plus, 230 V	1007290	Basic unit with integrated magnetic stirrer, incl. mains cable and connection cable for rod stirrer TZ 1581, 230 V
TW alpha plus, 115 V	1007291	Basic unit with integrated magnetic stirrer, incl. mains cable and connection cable for rod stirrer TZ 1581, 115 V
TW alpha plus 12, 230 V	1007292	Basic unit TW alpha plus with sample rack TZ 1452 for 12 samples, incl. titration head TZ 1463, mains cable, connection cable TZ 3084 and 20 beakers, 250 ml, low form, 230 V
TW alpha plus 12, 115 V	1007293	Basic unit TW alpha plus with sample rack TZ 1452 for 12 samples, incl. titration head TZ 1463, mains cable, connection cable TZ 3084 and 20 beakers, 250 ml, low form, 115 V
TW alpha plus 16, 230 V	1007294	Basic unit TW alpha plus with sample rack TZ 1459 for 16 samples, incl. titration head TZ 1463, mains cable, connection cable TZ 3084 and 20 beakers, 150 ml, low form, 230 V
TW alpha plus 16, 115 V	1007295	Basic unit TW alpha plus with sample rack TZ 1459 for 16 samples, incl. titration head TZ 1463, mains cable, connection cable TZ 3084 and 20 beakers, 150 ml, low form, 115 V
TW alpha plus 16-100, 230 V	285225870	Basic unit TW alpha plus with sample rack TZ 1457 for 16 samples, incl. titration head TZ 1464, mains cable and 20 beakers, 100 ml, tall form, 230 V
TW alpha plus 16-100, 115 V	285225880	Basic unit TW alpha plus with sample rack TZ 1457 for 16 samples, incl. titration head TZ 1464, mains cable and 20 beakers, 100 ml, tall form, 115 V
TW alpha plus 24, 230 V	1007296	Basic unit TW alpha plus with sample rack TZ 1454 for 24 samples, incl. titration head TZ 1469, mains cable, connection cable TZ 3084 and 30 beakers, 50 ml, high form, 230 V
TW alpha plus 24, 115 V	1007297	Basic unit TW alpha plus with sample rack TZ 1454 for 24 samples, incl. titration head TZ 1469, mains cable, connection cable TZ 3084 and 30 beakers, 50 ml, high form, 115 V
TW alpha plus MP, 230 V	1007305	Basic unit TW alpha plus with sample rack TZ 1459 for 16 samples, incl. titration head TZ 1467, washing unit MP 25, mains cable, connection cable TZ 3084 and 20 beakers, 150 ml, low form, 230 V
TW alpha plus MP, 115 V	1007306	Basic unit TW alpha plus with sample rack TZ 1459 for 16 samples, incl. titration head TZ 1467, washing unit MP 25, mains cable, connection cable TZ 3084 and 20 beakers, 150 ml, low form, 115 V
TW alpha plus CSB, 230 V	1007298	Basic unit TW alpha plus with sample rack TZ 1444 for COD-24 samples according to DIN 38 409, incl. titration head TZ 1461, redox electrode Pt 5901, rod stirrer TZ 1846, titration tip TZ 1648, mains cable and connection cable TZ 3084, 230 V
TW alpha plus CSB, 115 V	1007299	Basic unit TW alpha plus with sample rack TZ 1444 for COD-24 samples according to DIN 38 409, incl. titration head TZ 1461, redox electrode Pt 5901, rod stirrer TZ 1846, titration tip TZ 1648, mains cable and connection cable TZ 3084, 115 V
TW 7400	1007400	Basic unit without titration head and sample rack. With connection cable TZ 3987 for the connection on titrator TitroLine® 7XXX, power supply 100-240 V
TW 7400-42	285226600	Basic unit with sample rack TZ 3942 for 42 samples, titration head TZ 3963, rod stirrer TZ 1847 and FEP-hose (5 m), 100-240 V
TW 7400-48	285226620	Basic unit with sample rack TZ 3948 for 48 samples, titration head TZ 3964, rod stirrer TZ 1847 and FEP-hose (5 m), 100-240 V
TW 7400-72	285226630	Basic unit with sample rack TZ 3972 for 72 samples, titration head TZ 3969, rod stirrer TZ 1847 and FEP-hose (5 m), 100-240 V
TW 7400-42 MP	285226610	Basic unit with sample rack TZ 3942 for 72 samples, titration head TZ 3967, rod stirrer TZ 1847, washing unit MP 25 and FEP-hose (5 m), 100-240 V

Accessories for sample changer TW *alpha* plus and TW 7400

Type No.	Order No.	Description
TZ 1444	285213836	Sample tray for TW alpha plus for 24 COD vessels according to DIN 38 409
TZ 1452	285214927	Sample tray for TW alpha plus for 12 sample vessels, incl. 20 beakers, 250 ml, low form
TZ 1453	285213853	Sample tray TW alpha plus for 12 sample vessels, incl. 20 beakers, 600 ml, tall form
TZ 1454	285213844	Sample tray for TW alpha plus for 24 sample vessels, incl. 30 beakers, 50 ml, tall form
TZ 1457	285213869	Sample tray for TW alpha plus for 16 sample vessels, incl. 20 beakers, 100 ml, tall form
TZ 1458	285213918	Sample tray for TW alpha plus for 16 sample vessels, incl. 20 laboratory bottles, 100 ml
TZ 1459	285213166	Sample tray for TW alpha plus for 16 sample vessels, incl. 20 beakers, 150 ml, low form
TZ 1463	285213647	Titration head for TW alpha plus for 12 (TZ 1452) and 16 sample rack TZ 1459 with 7 drillings NS 14.5
TZ 1464	285213654	Titration head for sample tray TZ 1457 (16 positions) with 4 apertures different sizes
TZ 1467	285213671	Titration head for TW alpha plus for 12 (TZ 1452) and 16 sample rack TZ 1459 with 7 drillings NS 14.5 incl. splash shield and rinsing spray
TZ 1469	285213884	Titration head for TW alpha plus for 24 pos. sample rack TZ 1454 with 4 openings (2 x NS 14,5 and 2 x NS 7,5) and 1 adapter for micro electrodes with 6 mm diameter.
TZ 3942	285217790	Sample rack for TW 7400 with 42 positions for 150 ml beakers low form or 250 ml beakers tall form
TZ 3948	285217800	Sample rack for TW 7400 with 48 positions for 100 ml beakers low form
TZ 3972	285217810	Sample rack for TW 7400 with 72 positions for 50 ml beakers tall form
TZ 1844	285213199	Rod stirrer mid size model (120 mm) with NS 14.5
TZ 1846	285215134	Rod stirrer long version (200 mm) with NS 14.5 for COD reaction vessels according to DIN 38 409 section 41 for sample changer TW alpha plus
TZ 1847	285215175	Rod stirrer, short version with NS 14,5 for titration head TZ 1463, TZ 1467, TZ 1469, TZ 3942, TZ 3948 and TZ 3972
TZ 1545	285214232	Magnetic stirrer bar, 30 mm, 30 mm, 10 pcs. for TW alpha plus
MP 25	285216005	Membrane pump MP 25 with accessories (5 L - storage bottle, connection tubes, rinsing nozzle, connection cable) for TW alpha/TW alpha plus, 100-240 V

Data cables

Type No.	Order No.	Description
TZ 3840	285220690	USB connection cable, Type A (M) --- USB Type B (M), 1,8 m
TZ 3081	1007979	TW alpha plus <-> Mettler AB-S, PG balances, 5 m
TZ 3082	1007977	TW alpha plus <-> Sartorius balances, 5 m
TZ 3087	1007976	TitroLine® 7000, TitroLine® 7750, TitroLine® 7800, TITRONIC® 500 or TITRONIC® 300 <-> TW alpha plus, 1,5 m
TZ 3091	285223504	TITRONIC® 300, TITRONIC® 500 TitroLine® 5000, TitroLine® 6000, 7000, 7750, 7800, 7500 KF, 7500 KF trace <-> PC, 5 m
TZ 3092	285223529	TitroLine® 6000,7000, 7750, 7800, 7500 KF, 7500 KF trace <-> Sartorius balances
TZ 3094	285223545	TITRONIC® 300 <-> TITRONIC® 300, TITRONIC® 500 <-> TITRONIC® 500, TitroLine® 7000 <-> TitroLine® 7000 etc.
TZ 3097	285223578	TITRONIC® 300, TITRONIC® 500 TitroLine® 5000, TitroLine® 6000, 7000, 7750, 7800 7500 KF, 7500 KF trace <-> PC, 1,5 m
TZ 3099	285223594	TitroLine® 6000,7000, 7750, 7800, 7500 KF, 7500 KF trace <-> Mettler AB-S, PG - balances, 1,5 m
TZ 3193	285223600	TITRONIC® 300, TITRONIC® 500 TitroLine® 5000, TitroLine® 6000, 7000, 7750, 7800, 7500 KF, 7500 KF trace <-> PC, 15 m
TZ 3891	285223465	TITRONIC® 300, TITRONIC® 500 TitroLine® 5000, TitroLine® 6000, 7000, 7750, 7800, 7500 KF, 7500 KF trace <-> PC, 5 m
TZ 3987	285217860	TitroLine® 7000, TitroLine® 7750, 7800, 7500 KF, 7500 KF trace, TITRONIC® 500 or TITRONIC® 300 <-> TW 7400, 1,5 m