



Water determination in all types of samples

HEADSPACE OVEN AND SAMPLE CHANGER FOR COULOMETRIC KF TITRATION

SI Analytics

a **xylem** brand

Water determination in all types of samples

The headspace oven technique allows the separation of the water to be titrated from liquid, solid and pasty samples.

The sample is weighed in a small glass vessel with lid and septum (vial) and heated in the oven to a defined temperature. A dry air or nitrogen stream flows over a needle through the sample and takes the water with it in a gaseous state. The air or nitrogen together with the water vapour is passed into the titration vessel and the water is immediately titrated coulometrically with the TitroLine® 7500 KF trace.

The advantage of this method is the avoidance of direct contact of the sample with the solvent/analyte. The analyte is not contaminated and therefore more samples can be analysed than with direct analysis. As a rule, side reactions do not occur.

The complete system consists of the TO 7280 headspace oven, the coulometric titrator TitroLine® 7500 KF trace and the TW 7650 sample changer. The headspace oven can also be operated without the sample changer with the TitroLine® 7500 KF trace (with or without TitrISOFT software, see next page).

The headspace oven technique is suitable for the following samples:

- Pharmaceutical products
- Natural products
- Plastics
- Hygroscopic substances
- Freeze-dried products, e.g. lyophilisates
- Oils and lubricants, creams, pastes
- Viscous materials (bitumen, tar, sewage sludge)
- Powder and pellets
- Food
- Petrochemicals



Advantages of the headspace oven and the sample changer:

- * Semi automatic or fully automatic water determination
- * No contamination of the analyte, generator and indicator electrodes
- * Application range from 35 ... 280 °C

TitriSoft software 3.5/3.5 P



The TitriSoft 3.5 software or its pharmaceutical compliant version TitriSoft 3.5 P is for the operation of the sample changer TW 7650 required, simplified but also the operation of the TO 7280 oven.

When using TitriSoft all parameters of the oven and of the TitroLine® 7500 KF

trace there entered and with the results stored in the database.

With TitriSoft further SI Analytics® instruments, such as the TitroLine® 7800 titrator, the sample changer TW 7450 and others can be controlled. Further information about TitriSoft can be found on our website.

with the TO 7280 and the TW 7650



The TO 7280 headspace oven for semi-automatic measuring

If you only have a few samples to measure per day, the semi-automatic headspace oven TO 7280 is the right choice.



Why semi-automatic? The user places the sample in the oven with the crimper and starts the method on the titrator or (optionally) on the TitrSoft software. Apart from entering the sample name and, if necessary, the initial weight, this is all that needs to be done in the next few minutes-

The needle head lowers automatically and the addition of air or nitrogen starts automatically as well. The desired bake-out temperature is stored in the method and is quickly reached.

Once the final criteria of the method are achieved, the result is displayed and documented and the next sample can be measured.



Advantages of the headspace oven:

- * Automatic lowering and raising of the needle head
- * Automatic switching on and off of the air/gas supply
- * Can be upgraded by the TW 7650 to a fully automatic system with sample changer



The TW 7650 sampler for fully automatic measuring



If the number of samples exceeds 15-20/day, it is recommended to use the sample changer TW 7650.

The assembly of the sample changer and oven is within a minute done and immediately ready for use. There is no additional power supply unit or cable required. Power is supplied via the TO 7280.

The user places the sample vials in the changer and starts the method/work list with the TitriSoft software. The software TitriSoft is required when using the sample changer.

The sample plate rotates to the correct position; the changer head lowers onto the sample vial and sucks the lid tight with a pump. The changer arm moves to the headspace oven and places the sample vial in the corresponding opening.

The needle head lowers and the measurement begins as described on page 4. When the measurement is finished, the needle head lifts and the measured sample is transported back into the sample rack. Then the measurement continues with the next sample.

Advantages of the sample changer:

- * Can be upgraded to the TO 7280 oven at any time
- * Up to 49 samples can be measured. One position is reserved for the zero-vial to determine the start drift
- * The start drift can be determined before each sample
- * Each sample can be measured at a different temperature

Specifications

TO 7280 headspace oven

Sample dosing:	Headspace vials (5 ml...)
Measuring range:	1 µg...100 mg absolute
Resolution:	0.1 µg
Reproducibility:	± 3 µg for 10...1000 µg, 0.3 % for > 1 mg
Temperature range:	35 °C ... 280 °C (isothermal)
Resolution:	1 °K
Power supply:	115 ... 230 V, 50/60 Hz
Power input:	250 W
Dimensions:	300 x 450 x 240 mm (W x H x D)
Weight:	7 kg
Ambient conditions:	Ambient temperature + 10 ... + 40 °C for operation and storage

TM 235 TO titration stand

Housing material:	Polypropylene, plastic coated
Dimensions:	80 x 130 x 250 mm (W x H x D), height without stand rod, bottles and titration vessel
Weight:	1.9 kg
Ambient conditions:	Ambient temperature + 10 ... + 40 °C for operation and storage
Power supply:	Via low-voltage connection (12 V) from TitroLine® 7500 KF trace titrator or power supply
Control:	Via USB port by TitroLine® 7500 KF trace titrator
Pump:	Integrated, for supplying the TO 7280 with air from the environment
Valve:	Automatically switching valve for air/nitrogen supply
Gas flow meter:	Adjustable between 50 - 500 ml/min

TW 7650 auto sampler

Number of positions:	49 samples + 1 zero vial
Power supply:	Supply via TO 7280
Power input:	Supply via TO 7280
Dimensions:	420 x 450 x 460 mm (W x H x D) incl. TO 7280
Weight:	10 kg without/17 kg with TO 7280
Ambient conditions:	Ambient temperature + 10 ... + 40 °C for operation and storage

Ordering information

TitroLine 7500® KF trace, TO 7280 headspace oven and TW 7650 sampler

Tye No.	Order No.	Description
TL 7500 KF trace M6	285227800	Module 6, coulometric KF-Titrator, scope of supply: basic titrator unit, generator electrode TZ 1752 without junction, connection cable LB 04 NN, TM 235 TO titration stand, stand rod, titration vessel TZ 1754, micro double platinum electrode KF 1150, connection cable TZ 3094
TL 7500 KF trace M6-TitriSoft Pharma	285227810	Module 6, coulometric KF-Titrator, scope of supply: basic titrator unit, generator electrode TZ 1752 without junction, connection cable LB 04 NN, TM 235 TO titration stand, stand rod, titration vessel TZ 1754, micro double platinum electrode KF 1150, connection cable TZ 3094 and TitriSoft 3.5 P
TO 7280	285227820	For water determination according to Karl Fischer method. Maximum temperatur 280 °C. Including power supply for 100 - 240 V
TW 7650	285227830	For the use with headspace oven TO 7280. Up to 50 vials (1 zero-vial + 49 samples) with 5 ml size.
TW 7650-TitriSoft	285227840	For the use with headspace oven TO 7280. Up to 50 vials (1 zero-vial + 49 sample vials) with 5 ml size. With TitriSoft 3.5 P
TO 7280 - TW 7650 set	285227850	Set includes KF headspace oven TO 7280 and the autosampler TW 7650. With TitriSoft 3.5 P.
TM 235 TO	285227860	For TO 7280. Scope of supply: basic unit with two 100 ml DURAN®-bottles including threads, holder TZ 3992 for the bottles, PTFE tubes including screw connections , gas flow meter and holder, 100 vials and grimper, molecular sieve, power supply (110 ... 240 V)

Accessories and spare parts

Tye No.	Order No.	Description
TZ 3988	285227870	Vails, 5 ml with crimp caps and septa, 100 pcs.
TZ 3989	285227880	Vials 5 ml, 100 pcs.
TZ 3990	285227890	Crimp caps made of aluminum with opening, 10 mm diameter, septa made of silicone/PTFE, 100 pcs.
TZ 3991	285227900	Crimper for aluminum caps
TZ 3992	285227910	Bottle holder for two 100 ml laboratory bottles for TM 235 TO
TZ 3993	285227920	Connection tube including screw connections for connection headspace oven TO 7280 - titration vessel TZ 1754/gas flow meter
TZ 3994	285227930	Fittings set drying bottle for TM 235 TO, 2 x fittings and 2 x O-ring
TZ 3995	285227940	Connection tube including screw connections for connection TM 235 TO - air filter
TZ 3996	285227950	PTFE tube 3,2 x 1,6 mm, 3 m
TZ 3997	285227960	Tube set complete for connection headspace oven TO 7280 - TM 235 TO
TZ 1632	285227990	Dosing tip made out of glass for titration vessel TZ 1754

Xylem | 'zīlēm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com

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