DASTEC
30 años de soluciones para la industria

OPSIS
LIQUIDLINE

HydROC
Operation Manual

Version E

1. Contents

2. Introduction

The HydROC Hydrolysis unit is an instrument that let you perform rapid and safe Acid Hydrolysis as part of Total Fat determinations.

This instrument works best together with the OPSIS LiquidLINE SoxROC extraction unit for optimal Total Fat measurements. The HydROC can also be used together with other systems on the market, please consult you OPSIS LiquidLINE representative for optimal configuration.

The instrument is intended to be used for boiling samples with hazardous chemicals and therefore caution is necessary when handling samples and using the unit. It is especially important that the operator reads and understands what is written in chapter 3 Safety.

We hope that you will enjoy using the OPSIS LiquidLINE HydROC unit.

3. Safety

Since the HydROC use hazardous chemicals it is important that every user read these safety instructions or be instructed by the laboratory manager.

3.1. User Safety

The instrument may only be used by laboratory personnel and other persons who have knowledge and/or experience of doing chemical analysis and dealing with hazardous chemicals.

Applications not mentioned in this document are improper. In particular, it is forbidden to use the instrument in the following instances:

- use of the instrument that require ex-protected instruments
- use of chemicals or reagents which can explode or inflame

It shall be noted that:

- modifications or upgrades to the instrument shall only be carried out by authorized service personnel

3.2. Safety Symbols


General Hazard


Corrosive acid


Crushing hazard


Electrical shock hazard


Hot Surface

Explanations used in this manual

Important, Please Note

Please Note, Protection Glasses is recommended

Please Note, Gloves should be used

3.3. Product Safety Systems

The instrument is designed and built in accordance with state-of-the-art technology. Nevertheless, risks to users, property, and environment can arise when the instrument is used carelessly or improperly. If the equipment is not used in a manner specified by this document, the protection provided by the equipment may be impaired.

3.3.1. Handling of Chemicals

The instrument boils hazardous chemicals at high temperature. Therefore it is of outmost importance to take care when adding samples in and out of the instrument. Care should also be taken of the very high temperature used in the process. It is recommended that only operators that fully understand the used chemicals should do this task.

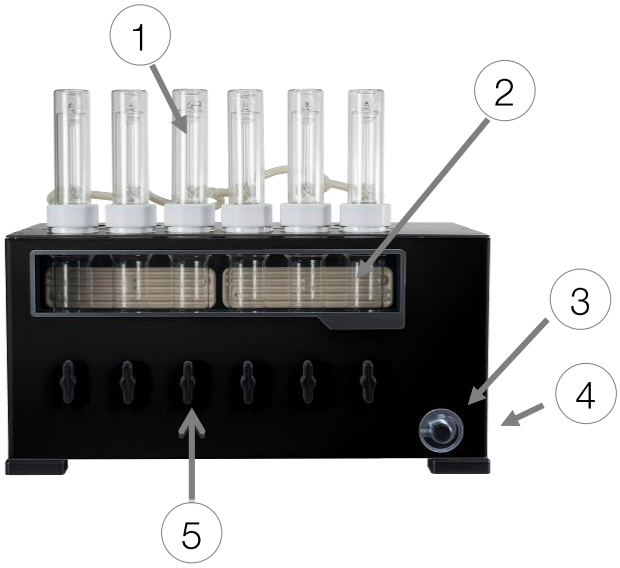
It is recommended to install the instrument in a fume hood. The installation should always be adapted to local regulations on lab environment.

3.3.2. Maintenance and Service

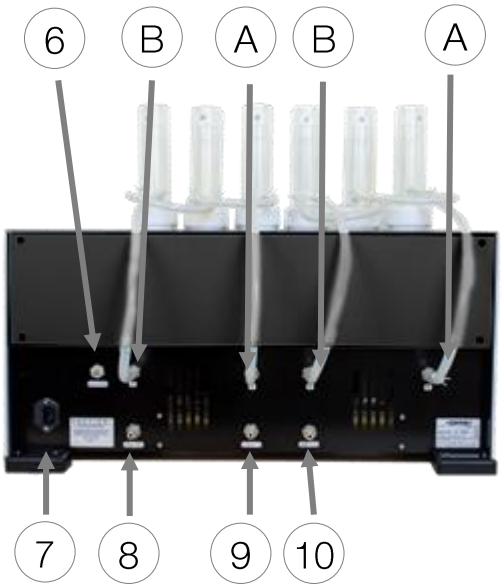
The operator is responsible for ensuring that recommended daily and monthly user maintenance is performed on the Instrument. Failure to do so might impair the functionality and/or shorten the lifespan of the instrument.

The operator is responsible to schedule regular maintenance with authorized service personnel only. Only OPSIS LiquidLINE spare parts should be used in the instrument.

4. Overview of HydROC



1. Condensers
2. Inspection Window
3. Power Knob
4. On/Off Switch
5. Drain Valves



6. Spraying Outlet
7. Power In
8. Cooling Water Inlet
9. Drain
10. Cooling Water Outlet

A/B Condensers inlet/outlet

11. Filter Holder
12. HydROC Filter
13. Filter Grab
14. Filter Stand
15. Plier to insert filters
16. Cup for weighing

5. Installation

Some parts will be dismantled during the transport to protect the HydROC. It is also necessary to connect tubes and power before using the instrument.

Please follow the instructions in this section for a proper installation.

The instrument should be placed into a Fume hood to protect the environment from corrosive acid fumes and in order to protect laboratory personnel from inhaling acid fumes.

5.1.1. Mounting of the Condensers

The condensers are pre-mounted into two packages. These needs to be connected to the HydROC. Attach the first package to left outlets marked “A” and “B”. Attach the second package to the remaining outlets marked “A” and “B”.

5.1.2. Connecting Water Inlet

Connect the reinforced cooling water PVC tube to the Cooling water inlet on the HydROC. Secure the tube with the supplied clamp. Connect the other end to the water tap.

5.1.3. Connecting Cooling Water Outlet

Connect the cooling water PVC tube to the cooling water outlet. Ensure that the other end of the tube is placed in a drain.

5.1.4. Connecting Drain

Connect the reinforced drain PVC tube to the drain outlet on the HydROC. The tube should not be bent up to avoid creation of a water lock.

Note, this outlet is used when draining Hydrochloric Acid from the cups. The tube should be placed at a secured position and preferably with a warning sign.

5.1.5. Connecting Rinsing Water (optional)

The optional HydROC Water Dispenser (Article SX-016-A) can be used to dispense rinsing water into the cups. If this dispenser is used then it should be connected to the spraying outlet at the rear (Connector six, page 4).

5.1.6. Connecting Power

Connect the Power cable to the HydROC power inlet.

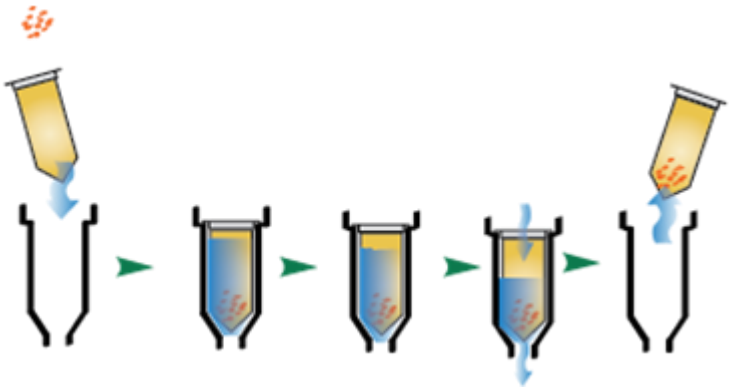
6. Function and Method

The HydROC is designed to simplify the Hydrolysis steps for Total Fat Determinations. This includes using the OPSIS LiquidLINE HydROC Filters that are designed to withstand both Acid Hydrolysis and Hot Solvent Extraction.

The total method and necessary steps when using the OPSIS LiquidLINE system are described below. The Application note for the corresponding sample type should be used in combination with this instruction.

6.1.1. Acid Hydrolysis (HydROC)

1. Grind or mill the samples according to method.
2. Weigh your samples and insert them into the HydROC Filters. Insert all filters into the HydROC. You can use the supplied aluminum cup when weighing samples.
3. Boil the samples in Hydrochloric Acid (HydROC unit)
4. Rinse samples with water to remove all Hydrochloric Acid. It is important to rinse and remove all acid since any left-overs will affect the extraction (HydROC unit)
5. Dry the samples from the Hydrolysis in a micro-wave oven or a heating oven.



The HydROC steps: 1 insert sample into filter, 2. add hydrochloric acid, 3.boil, 4. Rinse, 5. remove sample

6.1.2. Hot Solvent Extraction (Requires SoxROC instrument)

6. Weigh empty cups
7. Place samples from the Hydrolysis in the cups and thereafter into the OPSIS LiquidLINE SoxROC Extraction unit.
8. Boil samples in solvent (automatic in SoxROC)
9. Rinse samples to ensure that all fat is released (automatic in SoxROC)
10. Initial drying of samples and cups (automatic in SoxROC)
11. Remove all remaining solvent by drying cups in oven.
12. Weigh cups. Calculate extracted matter.

7. Operation of HydROC

The HydROC Hydrolysis unit is intended for boiling samples in Hydrochloric Acid. A step-by-step process is recommended for successful Acid Hydrolysis and sufficient rinsing prior to the extraction.

1. Prepare each of the six HydROC filters. Insert a holder inside the filter bag and secure with the filter grab.

2. Grind or mill the samples according to selected method or Application note.
3. Weigh your samples and insert them into the HydROC Filters. The supplied Filter stand should be used for holding your filters during this process.

4. Insert your filters into the HydROC. You can use the supplied plier when inserting.

5. Ensure that all drain valves are closed by checking that all knobs are in horizontal position. Add 100 ml diluted Hydrochloric Acid into each cup (typically 3M HCl for Feed and 4M HCl for Food/Pet Food samples. Please also read the advices given in LA1002 Application Guide SoxROC Solvent Extraction).
   Always take care when adding Acid.

6. Move the condensers onto each cup and turn on cooling water.

7. Power on the instrument using the switch on the right hand side. Turn the power nob to 100% to ensure maximum effect and fast boiling. Typically the acid will boil after ten minutes.

8. As soon as the acid starts to boil, reduce power to 50-75% to ensure a stable boiling and to reduce the risk of too intensive hydrolysis. Boiling time might vary depending on application, 60 minutes is common.

Please note that the HydROC unit is equipped with a thermostat that will switch off the IR element heating in case there is a risk of overheating. The heating will resume as soon as the instrument has cooled.

9. Switch off power and let the HydROC cool for 5-10 minutes to lower the temperature of the Hydrochloric acid.
10. Open the drain valves to remove all acid by turning the knob in vertical position.

Take care when emptying the Acid so that drain outlet is at a secure place. It is not recommended to remove the condensers from the cups until the rinsing step is completed.

11. Close the drain valve slightly to limit drain out from cups or alternatively close the valve completely.

12. Rinse the filters with water. The rinsing steps should be repeated four to five times. If tap water is used the optional HydROC Water Dispenser (Article number SX-016-A) is recommended for easy operation.

    a. Add rinsing water via the condenser
    b. Move to the next condenser
    c. The first cup should be empty when reaching the last cup if you have limited the drain out. Alternative method is to open and close valves completely.
    d. Repeat four to five times until neutral

13. Remove the condensers and move the samples to the Filter stand.

14. Dry the samples in a micro-wave oven, 200W during 30-60 minutes (after 30 minutes, check every 5 minutes), or a heating oven around 100°C overnight. The Filter stand can be used inside a microwave oven.

    If there is no available scale on the Microwave oven then you can check the Microwave Settings with the following method:

    a. Fill a small glass beaker with 1000ml of 20°C water. Make sure to measure the temperature with a precision of at least one decimal.
    b. Heat the water in the microwave oven at lowest power setting for 120 seconds
    c. Measure the temperature of the water again. To be able to dry the samples quickly and accurately the temperature difference should be in the interval 4-6°C. If temperature difference is too small, try the next setting on the microwave and carry out the test again until the difference falls into the given interval.

15. The samples are now ready for extraction. Please see your SoxROC User Manual for instructions.

8. Maintenance

The HydROC is built to last but reagents and heat will affect the instrument lifetime. A good maintenance of the instrument is therefore important.

8.1. Daily maintenance and cleaning

The following routine is recommended to perform on a daily basis:

- Use a wet cloth to wipe of any spillages from the instrument
- Remove any Hydrochloric Acid from the cups, rinse with water

8.2. Weekly maintenance and cleaning

The cups will become dirty after a period of use, preventing a good visibility inside the instrument. It is therefore advisable to clean the cups at regular intervals.

There are several different cleaning products on the market and an oven cleaning spray will work best. Recommended is to use a standard oven cleaner spray, for example “Mr. Muscle Oven Cleaner”. It will dissolve the burned residues in the boiling vessels.

- Spray oven cleaner in the vessel and leave it for some 20 minutes
- Wash with hot water
- If it is really dirty then you can use a normal dish brush together with the cleaner.

9. Technical Data

Operating Temperature	5°C - 40°C
Relative humidity	max 80 %
Power Supply	190-240 VAC, 50-60 Hz, 10A
Power consumption	max 2000 W
Dimensions (WxHxD)	655 x 325 x 475 mm
Weight	25 kg

10. Declarations and Requirements

CE

Declaration of Conformity

Identification of apparatus:	HydROC Hydrolysis Unit SX-110
Model/type:	HydROC 6 pos
Manufacturer:	OPSIS AB Box 244, SE–244 02 Furulund, Sweden Phone: +46 46 72 25 00

The undersigned hereby declares that the above-referenced product, to which this declaration relates, is in conformity with the provisions of:

- Council Directive 2014/30/EU (February 26, 2014) on Electromagnetic compatibility (EMC),
- Council Directive 2014/35/EU (February 26, 2014) on Electrical Safety: low-voltage electrical equipment,
- Council Directive 2006/42/EC (June 9, 2006) on Safety of Machinery,
- Council Directive 2011/65/EU (June 8, 2011) on Restriction of the use of hazardous substances (RoHS 2).

The below harmonised standard specifications have been applied:

Safety:

ANSI/ISA-61010-1 (November 5, 2012) Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

Electromagnetic Compatibility:

Emission: EN 61000-6-3 (2007)

Immunity: EN 61000-6-2 (2005)

October 8, 2018

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