

### **Basic information**

### Intended use

ULTRA X moisture analysers are solely designed to quickly measure moisture and dry matter in solid, viscous and fluid substances using thermogravimetric analysis. A sample is weighed while being dried by infra-red heat.

### Common features for all ULTRA X devices:

Short measurement time, gentle and even drying of samples, high reproducibility

Automatic or time-controlled measurement shut-off

### UX 3011/ 3011Q/ 3011HQ

Temperature-controlled infra-red heater 250 W/ 375 W Temperature range: 40 – 200 °C/ 360 °C/600 °C Stainless steel drying tray 111 mm diameter

### UX 3031

Special device for gypsum industry 2 temperature-controlled heaters for separate measurement of free and chemically bound moisture in gypsum products Temperature range: 40 – 360 °C Stainless steel drying tray 111 mm diameter

### UX 3081/ 3081WQ

Special device for extra large samples, e.g. in the chipboard industry 2 temperature-controlled ceramic heaters Temperature range: 40 – 220 °C/ 300 °C Stainless steel drying tray 245 x 120 mm





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### Safety instructions

Always transport the device in an upright position and protect it from impact.

Always operate the device on a level surface, using a vibration-free base.

Avoid draughts.

Never touch the (luminous) heater when it is hot, as there is a risk of injury!

Always disconnect the plug from the mains supply before performing any work on the device (e.g. changing the heater)! Repairs should only be carried out by a qualified technician.

Never place flammable material next to the device, as there is a risk of fire!

Please take extra care when using flammable samples! You may need to contact the manufacturer for advice.

Please be careful not to drop any sample particles next to the tray support plate.

Carefully remove any particles with a vacuum cleaner.

Only use accessories specifically designed for use with ULTRA X devices.

Do not move the device during measurement, as this will result in measuring errors.

Do not leave any substances in the measuring tray, if they are not being measured.

Devices should only be shipped in the original packaging using the original packaging material.

ULTRA X moisture analyzers are stand-alone units and are not designed to be used in continuous production runs. Any such use is at your own risk.

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### Warranty

a&p instruments undertakes to repair faulty devices within the warranty period, free-of-charge, if the defect is a manufacturing fault. This warranty covers the repair of spare parts and working hours required. It does not cover normal wear-and-tear and soiling and staining of the device. a&p instruments will not accept any freight costs.

This warranty does not apply to:

improper use of the device, use of the device for purposes other than those stated by a&p instruments, mechanical damage or damage caused by fluids or sample matter, incorrect set up or wrong electrical wiring, mechanical damage of the load cell e.g. as a result of being overloaded

### Transport, packaging, installation site

- Please check the packaging and device for any damage upon delivery.
- Please retain the original packaging in case you need to return the goods to a&p instruments.
- Please only use the original packaging when returning the goods.

### Accessories supplied:





2 trays



Tray tongs

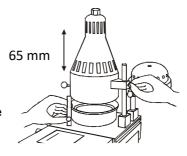


Mains cable

Tray holder

### Start-up

- 1. 1. Place the device on a stable, vibration-free surface, as level as possible and protected from draughts. The most suitable locations are the corners of a room, rooms with only one entrance and heavy tables on concrete floors.
- Start by adjusting the heater to the height marked on the rod. To do this, slightly loosen (never completely unscrew) the knurled screw on the back of the reflector holder. Retighten the knurled screw manually.



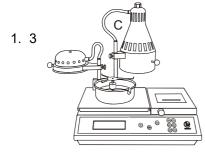


65 mm 🕽

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UX 3011HQ no distance





Now swing the heater to the right or the left to its rearmost position. Avoid using force to twist the heater beyond its stop point, as this could damage the device. Place the tray holder on the device by turning it slightly in a clockwise direction. (Also remove it by turning in a clockwise direction).

 4. Next place one of the two drying trays supplied on the tray holder using the tong. The notch in the reflector tray acts as an access gap for easy positioning of the tray.

### 1. 5. Check that the voltage indicated on the type plate matches the local mains voltage.

 6. The power cable is inserted into the device's power jack and a suitable earthed mains supply. After the power supply has been connected, the device can be switched on or off using



the on/ off button on the back of the device. Once the device is switched on, the current software version is shown, followed by the

weight display.

ULTR V.2.		3031D
mode	value (wold	ht) unit

- 1. 7. In order to prevent weighing system measuring errors, the device should be switched on 20 minutes before being used to allow for heat compensation. If weight values vary in the display's milligram range during this period, this is considered normal within this phase. If the device is switched off using the reset (on/ off) button, it does not require a warm-up period, if switched on again with the same button.
- 1 8. ULTRA X moisture measuring devices are supplied, so that in most cases substances can be measured immediately. If you are not satisfied with the result, the measurement parameters can be adjusted:

### Printer



The ULTRA X Thermo paper is stable for 10 years.

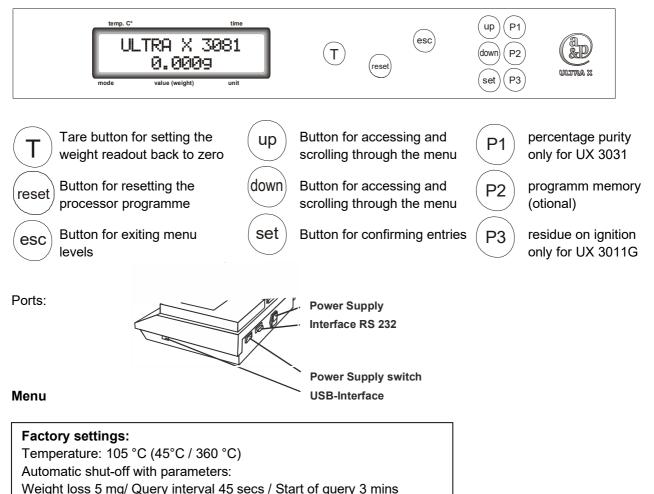
**Change Paper** 





### **Operation**

### **Display and buttons**



### Menu settings

The device's Preferences menu can be accessed using the 'up' or 'down' button.

In this instruction manual, it is assumed that the 'down' button (down)

The menu is operated using a standard structure:

Quartz heater 12mg/ 15 secs / 3 mins

Buzzer switched on when measuring process is complete

UP or DOWN	
SET	
ESC	

Set parameters

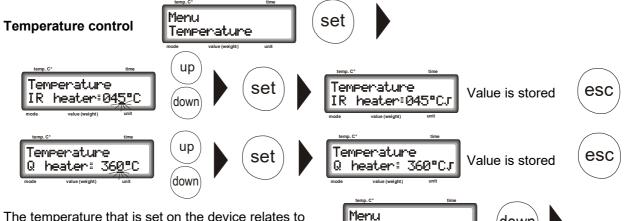
Confirmation of menu level and if required, return to previous menu level Return to previous menu level and exit from menu

If you confirm a wrong entry with 'set', press 'esc' and 'set' to reselect and change the menu item.

follows the menu item sequence.



dow



The temperature that is set on the device relates to the thermal radiation that hits the sample to be dried.

The thermal radiation is an electromagnetic wave for

the transmission of energy. As this energy creates heat in the sample, the moisture evaporates from the sample. The temperature is used to set the energy that allows the moisture to evaporates from the material

Temperature

### (more temperature is more energy).

The set temperature is not to be equated with the temperature to which the material or the environment heats up.- The material or ambient temperature is a consequence of the drying process, not the cause of the drying.

### Automatic shut-off or timer



The <u>automatic mode</u> dries the sample until a constant weight is reached and then switches off the heater.



1. Weight loss in mg

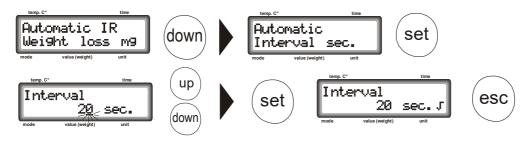
a value should be defined here which corresponds to approx. 0.1 % of the original sample e.g. original sample 10 g = 10 mg



When the weight loss <= the mg weight specified here within the interval period defined below, the measurement is completed, if at least the start of query time limit has expired.

### 2. Query interval in secs.

an interval should be selected here, so that the sample is not dried for too short a period but also not for far too long. A period of 20 to 30 secs is normally adequate. None /10-99 secs can be selected.

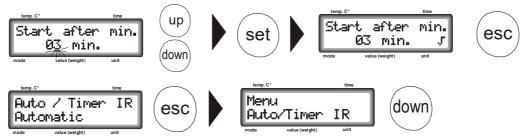






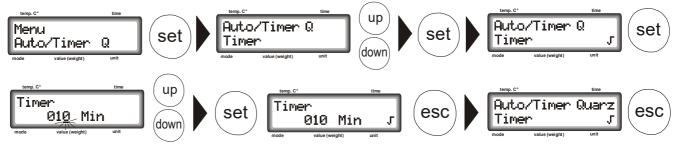
3. <u>Start of query in minutes</u>

Specify the drying period required for the samples without automatic mode. The factory-set 3 minutes are usually adequate. This value should be increased for extremely low temperatures, so that the device does not switch itself off prematurely. This affects the UX 3031 in particular, when free moisture is being measured at 45°C. You can select 1-99 mins.

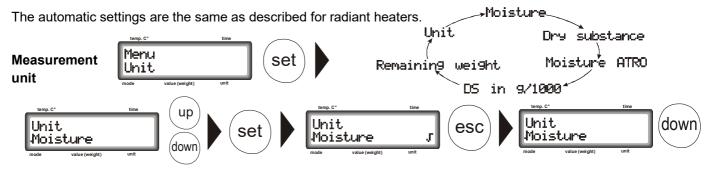


The timer setting is the same as described for the quartz heater.

Values for the luminous and quartz heaters (only UX 3031) are entered separately from each other. Both heaters can be controlled separately from each other via automatic mode or the timer.



It is possible to select a drying time of 1 – 180 mins



During measurement, the device optionally displays:

% moisture

% dry matter (TS) % moisture Atro (), i.e. moisture related to the dry matter Dry matter (TS) in g/1000g

Weight loss g (V)

Residual weight g (R) (current weight)

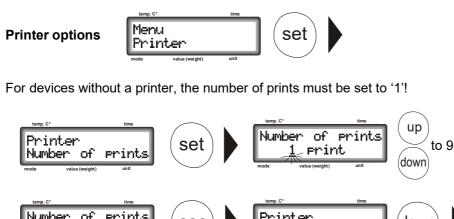
After measuring of gypsum, the purity can displayed with <P1> button.

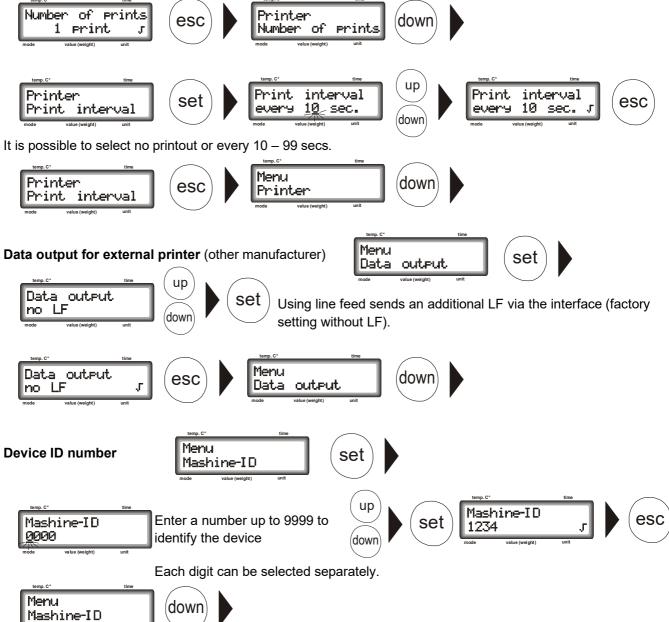
Example: 50 % moisture = 100 % Atro

25 % moisture = 33.3 % Atro 75 % moisture = 300 % Atro

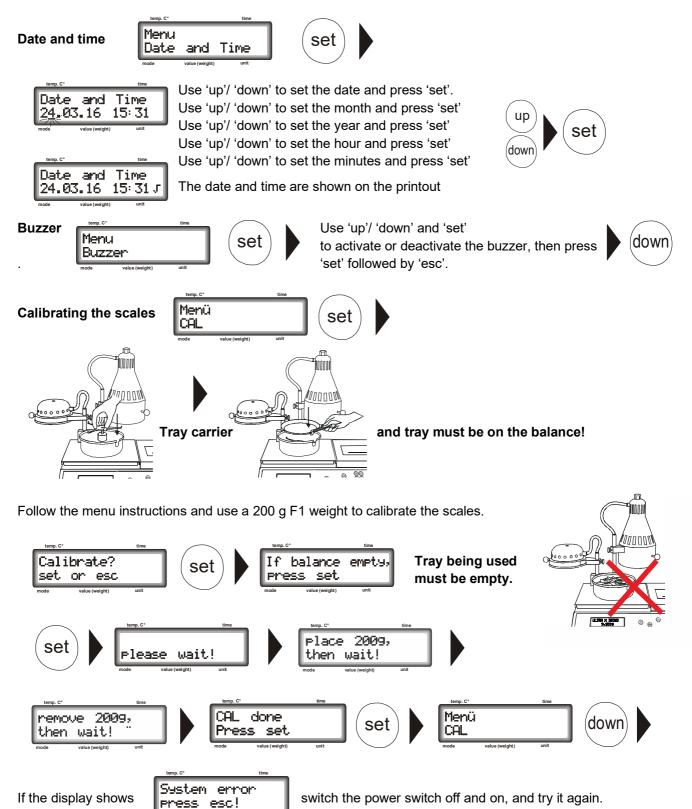


set

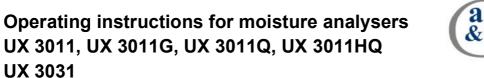




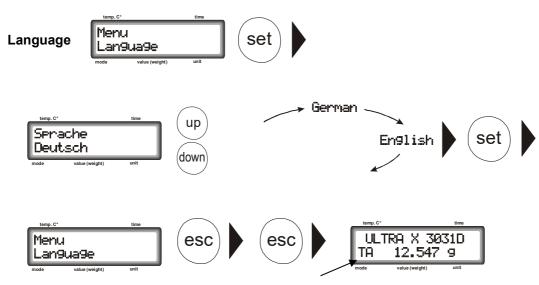




The reason for this, please look at "potential errors" on page 15





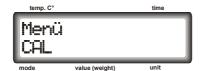


The first two letters on the second line stand for Automatic (A) and Timer (T). They show the mode set for each heater. Combinations: AA = Automatic quartz heater/ Automatic radiant heater

- TA = Timer quartz heater / Automatic radiant heater,
- TT = Timer quartz heater / Timer radiant heater,
- AT = Automatic quartz heater / Timer radiant heater.

### You can also lock the menu to prevent accidental changes to drying parameters.

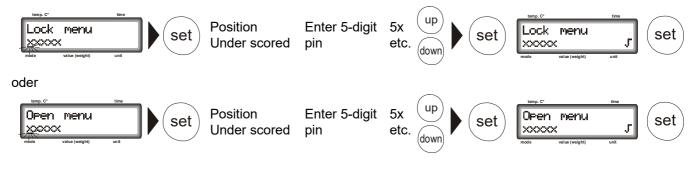
The 'CAL' menu option



can still be accessed when the menu is locked.

The menu can be locked or unlocked as shown below:

Press and hold the 'set' button for 5 secs:



If you forget the PIN, you can obtain a new one from a&p instruments.



Saving drying parameters in the **program memory** using the ULTRA X 3031D as an example

If your device has a program memory, appears in the top left of the display

"HP" for type UX3011 and a number of 1-9,

"QP" for type UX3011Q and UX3011HQ and a number of1-9,

"HP" for type UX3031 and a number of 1-9 for the infra-red heater,

or "QP" and a number of 1-9 for the quartz heater,



depending on which heater the program memory was activated for from the manufacturer, here for the infra-red heater.

The standard parameters are set fom the manufacturer at the program memory place 1.

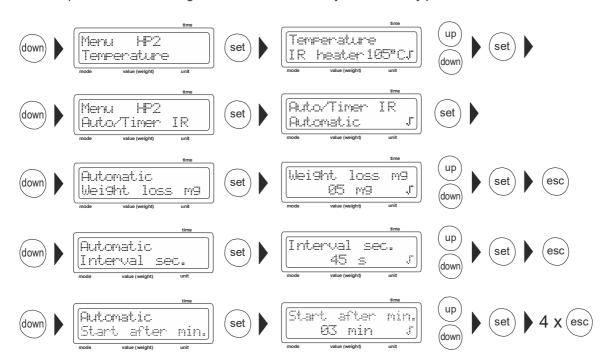
The di?erent drying parameters can be saved or be changed with button P2 Drying parameters are: temperature and the parameters of the automatic or the timer.



Here you can choose between the 9 memory places.

Then the menu set the temperature, the weight loss, the query interval and the query start.

All other parameters and settings are not saved individually to the memory place.



Changes for the quartz heater to the unit of measurement, printer settings, data output, device ID, date and time, Buzzer and language, same as temperature and the parameters of the automatic system a?ect all program memories at the same time.

### Moisture analysis process

1.

The device should be connected to the mains supply and switched on with a drying tray. A weight value is displayed.

Set scales to zero using the 'tare' button, display '0.000 g'.

# 0000 יחח ת 🕅 ULTRA X 3831

2. Swing the heater over the sample. After a short time, the heater switches itself on and the drying phase begins. Header data is now printed for devices with a built-in printer. The sample is dried until it has reached a constant weight; the heater then switches off automatically. The time and measurement value is printed for devices with a printer.

If you do not wish to make any measurements, please always ensure that the heater is swung back to its rearmost position!

- 3. Measurement values are displayed for the entire length of time the heater is positioned above the sample.
  - If measuring has stopped, you can see the purity of gypsum with

The device should not be moved from its position during measurement, as this causes measurement errors.

The built-in printer prints the following at the start of the measurement: Model, device ID,

date, time, heater temperature, timer or shut-off parameters, initial weight.

And after the device has finished measuring, once the heater has been swung back to its rearmost position: Measurement value, measurement time, substance,

Please ensure drying trays have cooled down before using for measurement.

was

Drying rocess

stopped!

If the measurement ends before it is complete, the display shows:

For substances which are difficult to remove from the tray after being dried, we recommend using foil trays,

ULTRA X 3011HQD

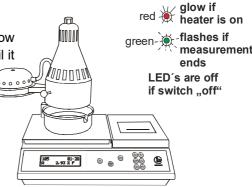
8,157 9

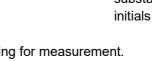
weight of the sample.



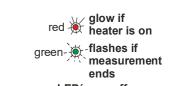
the tray and wait for the readout to stop.

Evenly distribute approx.









10 g sample matter in







which can be made quickly and economically from aluminium foil using the ULTRA X foil press.

### Data interface

Weighing data, temperature and drying data are also shown on the display via a standard USB flash drive and serial interface.

Depending on the model, a separate UX 3092 printer or a computer can be connected to the device.

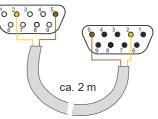
Interface description

Model: V24 RS 232 serial data transmission and USB flash drive

Transmission rate:	9600 baud
Number of bits	8 data bits
	1 stop bit
Parity check	none
Handshake	none

Data transmission using a USB flash drive





If the computer receiving the data has an internet connection, the system automatically installs a driver and creates a COM interface, as soon as the computer is connected to the moisture analyser. If this is not the case, the driver must be manually installed in the device manager.

Special software is required for transmitting data to a PC:

#### **ULTRA X DataChannel**

Data can be exported in four different data formats: . xls; .html; .xml; .txt.

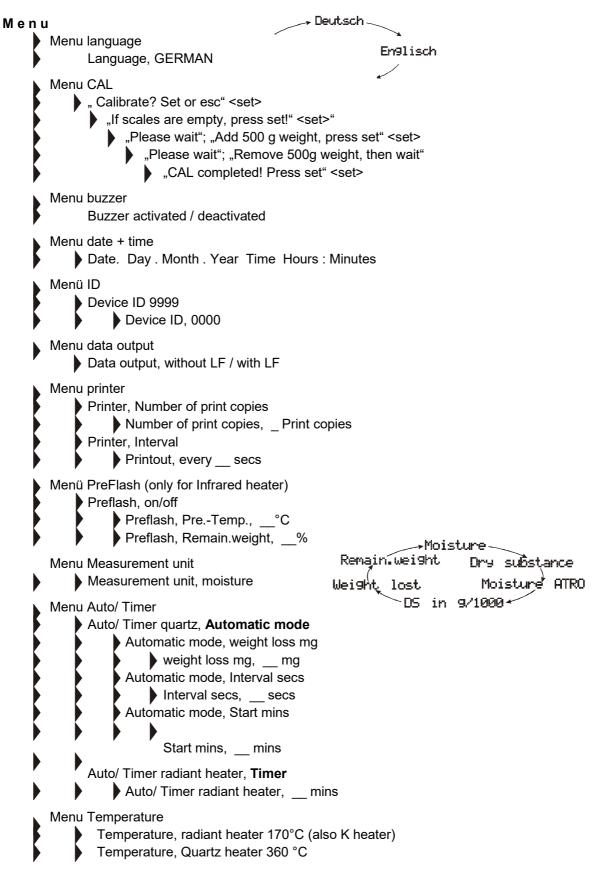
The software is extremely easy to install and use: Connect devices, place CD in PC, the installation is self-explanatory.

Accessories:	Order no.:	Application:
Stainless-steel drying tray Tray tongs Mains cable		Sample containers for UX 3011/ 3031 (2 trays supplied) for lifting the tray (supplied) Mains connection (supplied)

Consumables:	Order no.:	Application
Printing paper 58 mm	l1000234	for built-in printer
Aluminium foil  130 mm x 0.3 mm	H1000017	for placing on the drying tray
Foil press	10000062	for shaping aluminium foil
Infrared heater 250 W	H1000130	Spare part
Quartz heater 375 W	10000139	Spare part
Quartz heater 375 W HQ	10000149	Spare part



Overview of menu setup via the UP button





### **Potential errors**

Error	Reason	Solution
Display		
Display blank:	Initial load too small or large,	Place empty drying dray on centre of
temp. C° time	Tray support and / or tray missing	tray support,
ULTRA X 3031	Location with too much disturbance	Place on a vibration-free surface
	Draught	Protect from draughts
meas raise (neigh)	Area around tray support is dirty	Carefully clean area around tray support
	Scale is faulty	Contact a&p instruments
ULTRA X 3031	Scale without power	Contact a&p instruments
Time-out balance	Scale is not connected to control card	Contact a&p instruments
	Scale is faulty	Contact a&p instruments
Scale continuing to run:	Location with too much disturbance	Place on a vibration-free surface
	Draught	Protect from draughts
	Area around tray holder is dirty	Carefully clean area around tray holder
	Scale is faulty	Contact a&p instruments
Menu		
Drying parameters cannot be	Menu is locked	Unlock menu lock,
entered, only		contact the person responsible or
mode value (weight) unit		a&p instruments
Menu lock cannot be	5-digit pin for unlocking menu lock is	Contact a&p instruments at
unlocked	incorrect	a.ukena@apinstruments.de
Scale		
Scale cannot be tared	Weight within minus range	Switch off device, place empty tray on
		balance and switch on again
	Weight difference less than 16 mg	Less than 16 mg set to zero, press
	or more than 16 mg	button briefly
		More than 16 mg tare, press and hold
Scale cannot be calibrated:	Initial load too small or large, tray holder	Place empty drying dray on centre of
	and / or tray missing.	tray holder,
	Location with too much disturbance	Place on a vibration-free surface
	Draught	Protect from draughts
	Area around tray holder is dirty	Carefully clean area around tray holder
	Scale setting is incorrect	Contact a&p instruments
tona (il	Scale is faulty	Contact a&p instruments
semp. C' time System error press esc! mode value (weight) unit	System error Calibration process has stopped	Disconnect device from mains and switc on again.



Error	Reason	Solution
Measuring		
Heater will not switch on:	Heater is faulty	Change heater
	Temperature sensor is faulty	Contact a&p instruments
Infrared heater will not switch off	S202S01 relay is faulty	Contact a&p instruments
	Automatic shut-off is set incorrectly	Check shut-off settings
	Timer is set incorrectly	Check timer settings
Measurement not completing	Shut-off settings incorrect	Check shut-off settings
	Timer settings incorrect	
Printer		
No printout	Printer is faulty or	Contact a&p instruments
	no data transmission	Contact a&p instruments
No linefeed	Linefeed button or printer is faulty	Contact a&p instruments
	No connection to printer	Contact a&p instruments
Printout invisible	No thermal paper	Use the thermal paper from a&p
	Printing unit or printer board is faulty	Contact a&p instruments
Printout too light	Printing unit is dirty	Contact a&p instruments

### Care and maintenance

Please ensure that no pollutants enter the device.

Always keep the area around the tray holder clean.

Do not use compressed air to clean the device.

Do not overload the scales, max. weight 220 g, for ULTRA X 3081 max. 400 g.

Protect device from moisture and impact.

For ideal care and maintenance, we recommend taking out a service contract.

#### Disposal

The devices can be sent to a&p instruments for disposal. Do not dispose of with household waste!



### Technical data

### Scale:

Weight range	up to 220 g
Resolution	0.1 g
Sample volume	max. 95 cm <sup>3</sup>
Weighing tray	110 mm round

### For moisture analysis:

Initial weight	any weight from approx. 5 g, recommended from 10 g
Heater capacity	Infrared heater 250 watts Quartz heater 375 watts
Automatic shut-off	Automatic drying to a constant weight, using 3 factors for I heaters and Q heaters, which can be set separately: Query start, query interval, weight loss/ query interval
Temperature	Infrared heater adjustable from 40°C to 170 °C Quartz heater adjustable from 105 °C to 360 °C (3011Q)/ 105°C to 600°C (3011HQ) Ceramic heater adjustable from 40°C to 180 °C
Measuring units	% moisture % dry matter % ATRO moisture g solid matter/ kg
Reading accuracy 0.1% readable	

Reading accuracy 0.1% readable

#### Communication:

Data terminal	V24 RS 232/ USB
Data output	all weight and measuring data meet GLP requirements with a start time, optional variable
	interval printout, date, time, total measuring time etc.

Using **ULTRA X DataBridge** software can be transmitted to a PC as a .xls file in Microsoft Excel, PDF file.

#### For operating the device:

Mains connection	230 V 2%/ + 15 %
Mains frequency	48-63 Hz
Power input	250 watts – 375 watts, depending on the model
Dimensions	approx. B 385 x D 275 x H 420 mm
Weight	approx. 9 kg

Technical data subject to change without notice



ULTRA X moisture analyzers are stand-alone units and not suitable for use in continuous production runs. We shall not accept any liability for incorrect readings!



Accessories:	Order no.:	Use:
Stainless steel drying tray	10000282	Sample carriers UX 3011/ 3031 (2 trays supplied)
Tray tongs	10000230	for lifting the tray (supplied)
Mains cable	H1000019	Mains connection (supplied)
Calibration weight F1 200 g	10000403	for calibrating the scales
Aluminium foil 130 mm x 0.3	mm	H1000017 for placing on the drying tray
Foil press	10000062	for shaping aluminium foil
Software	DataBridge	for transmitting data to a PC
Consumables:		
Printing paper 58 mm thermal, stable for 10 years	10000234	for built-in printers
Infrared heater 250 W	H1000130	Spare part
Quartz heater 375 W Quartz heater 375 W HQ	10000139 10000149	Spare part Spare part



## Assembly ULTRA X 3011HQ

