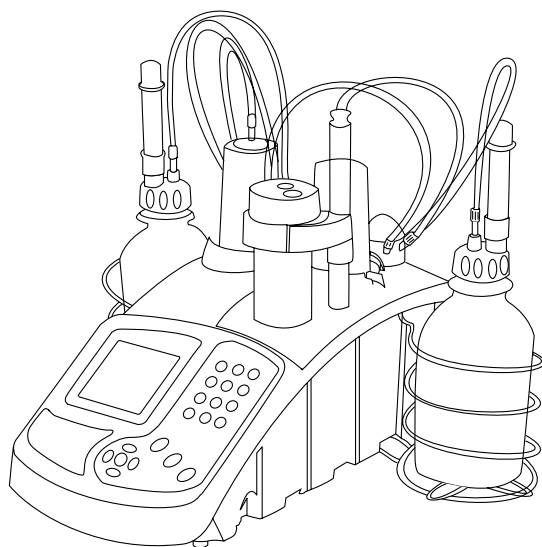


Volumetric Karl Fischer Titrator
Model 375
User's Guide



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General information

Safety Information

Please read this entire manual before unpacking, setting up, or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment. To ensure that the protection provided by this equipment is not impaired, do not use and do not install this equipment in any manner other than that specified in this manual.

Precautionary Labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed.

	This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.
	Electrical and electronic equipment marked with this symbol may not be disposed of in European public disposal systems after 13 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user. Note: Please contact www.denverinstrument.com for instructions on how to return your equipment for proper disposal.
	This symbol, when noted on the product, identifies the location of a fuse or current limiting device.

Warning !

The Model 375 has been developed to meet the requirements of volumetric titration applications. It is therefore aimed at experienced users who have the knowledge required to operate the instrument and implement the security instructions enclosed. Please remember that the Model 375 must not, under any circumstances, be used to perform tests on living beings.

We accept no responsibility for using the Model 375 and its peripheral devices under conditions that are not specified in this User's Guide and associated Reference Manual.

1. Introduction

Read me!

The interface of the Titration Workstation has been specially designed to clearly guide you through every step of the programming and running of the analyses, whether you are a supervisor or a routine user.

An important part of this interface is to check and control the presence of different elements necessary to run the defined application.

Working in Supervisor mode

When programming in “**SUPERVISOR**” mode, it is recommended to work in stages. These stages *should* be carried out in the order described below:

To program a method

1. Define reagents

Identify reagents to be used for the analysis.

Reagents can be created from the following lists, Catalogue, Other, Copy from. When creating the reagent, define if reagent calibration is required (or titre entered manually), if yes specify the “periodicity” of the calibrations and the calibration method. Refer to chapter 3.

2. Create a new method or Edit a pre-programmed one

Create the Karl-Fischer titration method to be used for the analyses. Enter the parameters required to calculate the results, refer to chapter 3.

When you have finished programming, select the method or pre-programmed application.

If a sample changer is to be used, declare the sample changer and enter the sample changer parameters in the Configuration menu.

3. Check icons

The following icons indicate the exact state of your working system.



Sunny icon:

Everything is OK. Run the method or sequence.

A Sunny icon is required to run the method.



Cloudy icon:

Action required within 12 or 24 hours. For example calibration and/or reagent bottle exchange.



Stormy icon:

Reagent calibration date elapsed or reagent not installed.

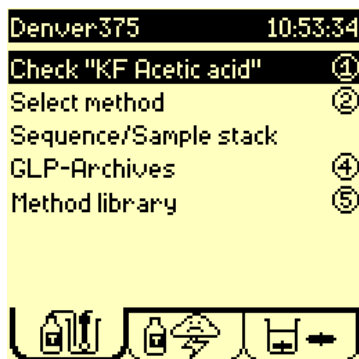


Question mark:

It is a programming error, reagent is not defined in the selected method. Revise the method programming.

Refer to Reagent window.

When a Stormy or a Question mark icon appears, press 1 "Check". The Titration Workstation will automatically guide you through the operations necessary to solve the errors encountered.



4. Running methods

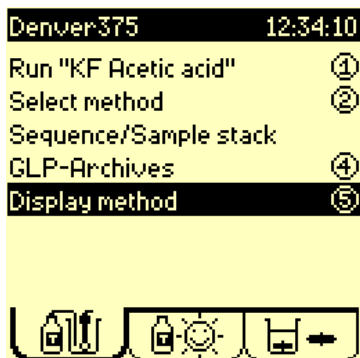
To run a method or sequence, refer to chapter 4.

Working in Routine mode

In “**ROUTINE**” mode you are guided at every step, thanks to the clear-text messages and the icons present on the large graphic display.

Access methods

A Routine operator has access to all the displays for *checking* purposes.



Running methods

When working in “**ROUTINE**” mode, it is necessary to install your titration system according to the selected method or sequence, prior to run a method or sequence.

1. Select the method or sequence

Refer to chapter 4.

2. Check icons

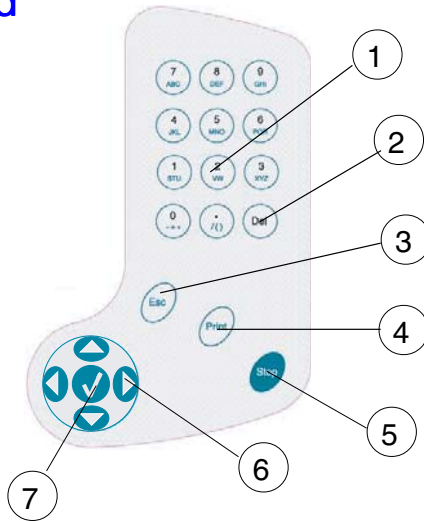
These icons indicate the exact state of your working system (see previous page).

3. Running methods

To run a method or sequence, refer to chapter 4.

2. Getting started

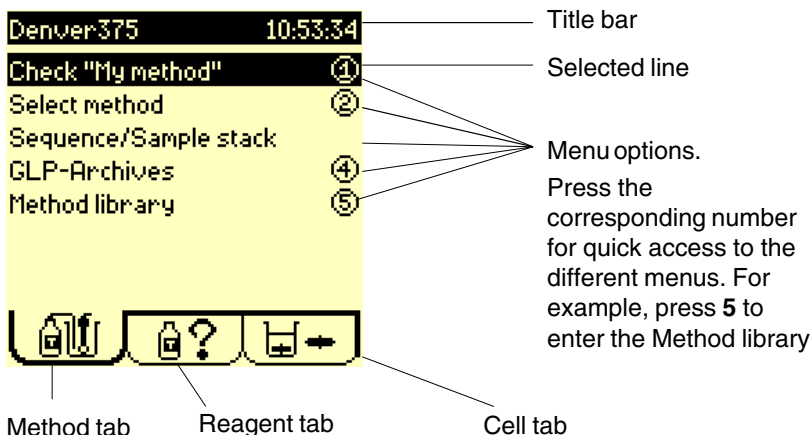
Keyboard



1. Alphanumeric keypad to enter data and parameters on the same principle as mobile telephones. These keys can also be used for quick access to the different menus; refer to the display on the following page.
2. **Del**: deletes the character on which the cursor is positioned. Operator may end a Start timer delay or a Delay after addition, end the analysis before the max. volume have been reached, if he considers his analysis finished. Calculations are performed.
3. **Esc**: returns to the previous screen.
4. **Print**: prints the data concerning the screen displayed.
5. **Stop**: stops an analysis or a burette function. Press this key for 3 seconds in the Main window to gain access to the setup parameters.
6. RIGHT, LEFT, UP, DOWN arrow keys are used to move to different options within the menus.
7. **✓**: confirms a data entry, a message or a function asked for by the user.

Basic principles

When the instrument is switched on, the Main window is displayed. When the instrument is switched on for the first time the screen will be as follows:



If required, you can adjust the contrast of the display by:

- pressing **0** to increase the brightness,
- pressing **7** to decrease the brightness.

The title bar in the menu indicates the instrument name and the actual time. You will be shown how to personalise the name and adjust the time further on in the manual.

The RIGHT and LEFT arrow keys allow you to move from one tab to the other and enter the **R e a g e n t** and **C e l l** menus.

- Work your way through the 3 tabs, then back to the Main window.

The UP and DOWN keys allow you to select a line. To enter an option, select the line, and press **✓**. You can also press the corresponding numerical key.

- Press **5** or select the line Method library and press 3 to enter the Method library screen. Press **Esc** to return to the Main window.

Main window

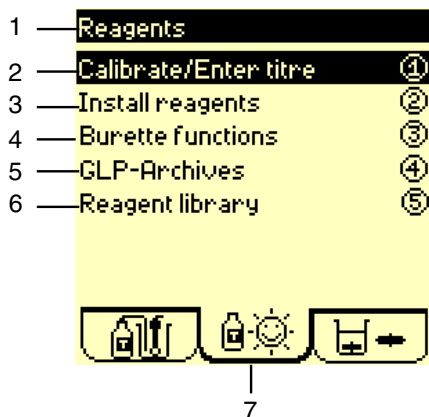
When the instrument is switched on the Main window is displayed.



1. **Title bar:** indicates the instrument name and the current time.
2. **Check or Run:** check or run the selected method /sequence. The method can be run when a sunny icon is displayed in the Reagent tab. *If a stormy icon is displayed, activate the "Check" command. The Titration Workstation will automatically guide you through the necessary operations required to solve the problem(s).*
3. **Select method:** select method to be used for the analyses.
4. **Sequence/sample stack:** if a Sample Changer is used and declared in the Configuration menu, program the sample stack. Select or edit the sequence.
5. **GLP-Archives:** access GLP tables and visualise the stored method sample results and global variables.
6. **Method library:** supervisor use only: create, edit, reset and delete methods to correspond to your specific needs.
Or **Display methods** - routine use only : display the main parameters of the selected method.
7. **Method tab:** Animated icon indicates when a method/sequence is running.

Reagents window

Use the **RIGHT** arrow key to move to this window.



1. **Title bar:** indicates the name of the window.
2. **Calibrate/Enter titre:** determine the concentration of the titrant (titre) by running a calibration or by entering the titre manually.
3. **Install reagents:** install or replace reagent in a method or sequence.
4. **Burette functions:** fill, empty, flush, rinse and replace burette. Global flush of all installed burettes simultaneously.
5. **GLP-Archives:** access GLP tables and visualise the stored reagent calibration results.
6. **Reagent library-** supervisor use only: create, edit, reset and delete reagents to correspond to your specific needs.
7. **Reagent tab:** reagent status icon indicates the state of the reagent system. Four types of icons can be displayed.



Sunny icon. The reagent calibration or manual entry of the titre has been performed on the reagent present in the current method/sequence.. Everything is just right!



Cloudy icon. The reagent calibration on the reagent present in the current method/sequence. should be performed within 12 or 24 hours. The expiry date of the reagent present in the system will elapse in less than one week.



Stormy icon. The reagent calibration or the expiry date has elapsed for the reagent present in the current method/sequence.

If acceptance limits have been set for the calibration: at least one calibration result lies outside the programmed acceptance limits.

The reagent present in the current method/sequence has not been installed.

Check the sequence or method, (press **1** in the Main window). The instrument prompts you to do the necessary operations. You are guided step by step.

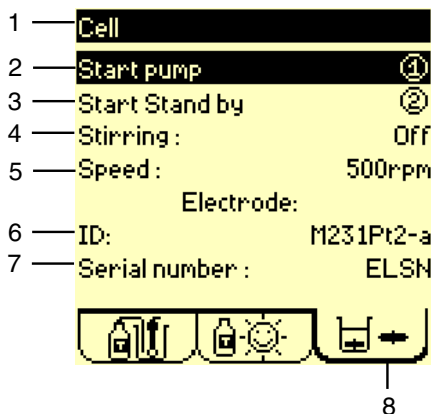


Question mark. There is a problem in the editing of the reagent system. You need to be in Supervisor mode to solve the problem. Check the sequence/method parameters of the reagent.

Check the sequence or method, (press **1** in the Main window). The instrument indicates the possible errors and prompts you to correct them until **?** disappears.

Cell window

Use the **RIGHT** arrow key to move to this window.




1. **Title bar:** indicates the name of the window.
2. **Start pump:** to fill the Karl-Fischer cell with solvent or the empty the Karl-Fischer cell.
3. **Start Stand by:** to maintain the cell ready for the next Karl-Fischer titration. During a Stand by, the cell is dried out permanently.
4. **Stirring:** command stirrer On/Off.
5. **Speed:** select the internal stirring speed, from 100 to 1100 rpm by steps of 50 rpm.
6. **Electrode ID:** to enter the name of the electrode used as indicating electrode of the Karl-Fischer titration (electrode connected to the Pt-Pt socket of the Titration Workstation).
7. **Electrode serial number:** to enter the serial number of the electrode used as indicating electrode of the Karl-Fischer titration (electrode connected to the Pt-Pt socket of the Titration Workstation).
8. **Cell tab:** animated icon indicates when the magnetic stirrer or propeller is operating.


Apply stirring

1. Select **Stirring = ON**,
2. Press ✓ in the field **Speed** and select a stirring speed.

Fill the Karl-Fischer cell with solvent

1. Press **1 (Start pump)**.
2. Press the Titration Workstation filling cell button  then press ✓ or **Stop** to stop the pump.

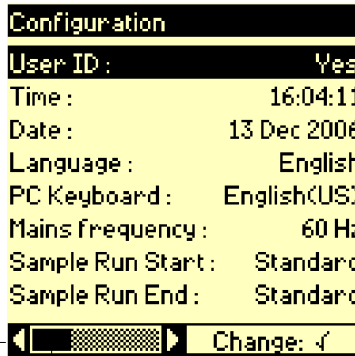
Empty the Karl-Fischer cell

1. Press **1 (Start pump)**.
2. Press the Titration Workstation emptying cell button  then press ✓ or **Stop** to stop the pump.

System configuration

Proceed as follows to configure your workstation

1. Press **Stop** for 3 seconds in the Main window to enter the Setup menu.
2. Supervisor code:
Entering a Supervisor code enables you to differentiate between the 2 operator modes: Routine and Supervisor:
In Routine mode, the user is able to select and run methods. In Supervisor mode, the user can create, edit, select and run methods. A Supervisor code is also used to protect your parameters from any unwanted changes.
 - Continue without entering a Supervisor code.
3. Press **1** to enter the Configuration menu.

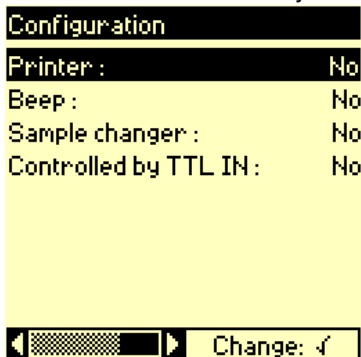


Use the UP and DOWN arrow keys to select the parameter.

Horizontal scroll bar

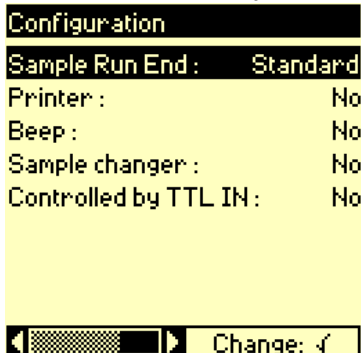
The position of the bar indicates the first screen in the Configuration menu. Use the RIGHT arrow key to move to the next screen.

4. Press the RIGHT arrow key.

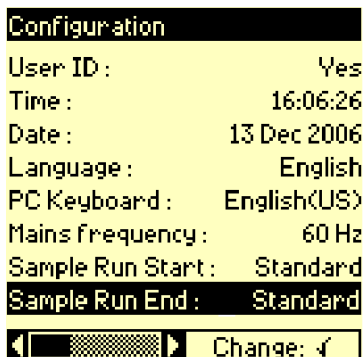


The position of the bar indicates the last screen in the Configuration menu.

5. Press the UP arrow key.



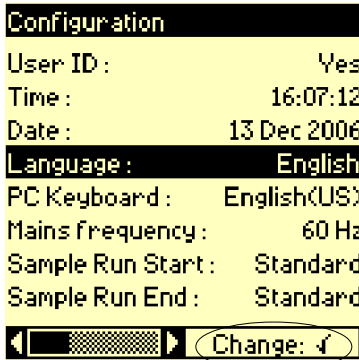
6. Press the LEFT arrow key to return to the first screen in the Configuration menu.



Choosing the language

Choose your language for displays and printouts in the following way:

1. Use the UP and DOWN arrow keys to select the Language line.
2. Press ✓ to change a parameter as indicated at the bottom of the screen.



3. Select the language.



Esc allows you to leave the screen without changing the language.

Setting the date and time

The current date and time are entered in the following displays:

1. Select **T**ime.



Time

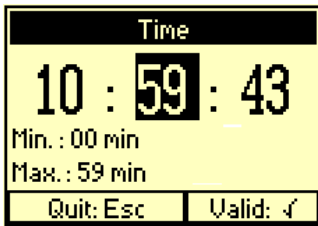
09 : 59 : 43

Min. : 00 hrs
Max. : 23 hrs

Quit: Esc Valid: ✓

Enter the hours (from 00 to 23).

2. **R**IGHT arrow key.



Time

10 : 59 : 43

Min. : 00 min
Max. : 59 min

Quit: Esc Valid: ✓

Enter the minutes (from 00 to 59).

3. **R**IGHT arrow key.



Time

10 : 02 : 43

Min. : 00 sec
Max. : 59 sec

Quit: Esc Valid: ✓

Enter the seconds (from 00 to 59).

The **L**EFT arrow key allows you to return to the previous screen to modify an entered value.

4. Press **✓** to confirm (as indicated on the screen).

5. Select Date.

Date	
28	Sep 2006
Min. : 01	
Max. : 31	
Quit: Esc	Valid: ✓

Enter the day (from 00 to 31).

6. Press RIGHT arrow key.

Date	
29	Sep 2006
Min. : Jan	
Max. : Dec	
Quit: Esc	Valid: ✓

Use the UP/DOWN keys to select the month.

7. Press RIGHT arrow key.

Date	
29	Oct 2006
Min. : 2000	
Max. : 2069	
Quit: Esc	Valid: ✓

Enter the year (from 2000 to 2069).

8. Press ✓.

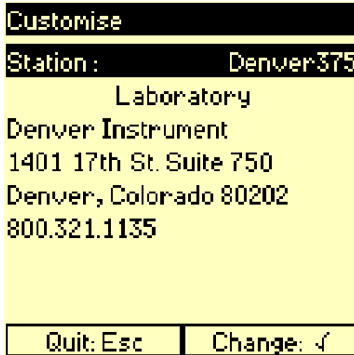
Customising the workstation

You can assign a name to your workstation, which will be permanently displayed in the title bar of the Main window . Typing the name will allow you to get used to using the instruments keypad.

1. Before leaving the Configuration menu:
 - Select PC keyboard ,
 - select English (US) .

This allows you to use a QWERTY keyboard.

2. Press Esc to return to the SETUP menu.
3. Press 3 (Customise).



4. Press ✓ to select the Station parameter.



5. To replace "Denver375" by "Chem.lab-1", proceed as follows:
 - Press 7 until the letter "C" appears, then release the key. The cursor moves to the next position.

Station	
C_	
Quit: Esc	Valid: ✓



- Press 9 until the letter "h" appears.
- Continue until you have entered (em.lab-1).
- To correct a typing error, proceed as follows:

Station	
Chem.leb-1_	
Quit: Esc	Valid: ✓

Station	
Chem.leb-1	
Quit: Esc	Valid: ✓

Press the LEFT arrow key to position the cursor on the letter "E". Press 7 to enter the letter "A".

Station	
Chem.laeb-1	
Quit: Esc	Valid: ✓

The letter E has been inserted between the letter "A" and the letter "B".

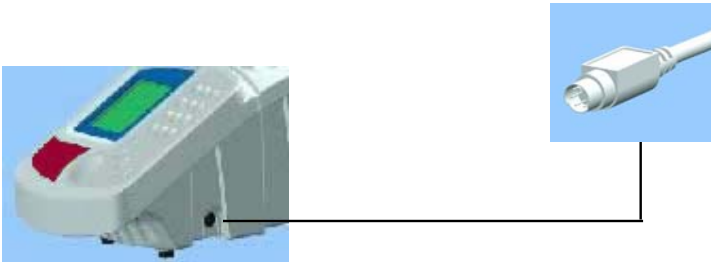
Station	
Chem.la b -1	
Quit: Esc	Valid: ✓

Press **Del** to delete the "E".

- Press ✓ to confirm the entry.

6. You can also use a PC keyboard to enter alphanumeric characters.

- Connect the PC keyboard to the 6-pin plug situated on the left hand side of the instrument.



- Select the line **D e n v e r I n s t r u m e n t**. This line is used to enter information concerning the workplace, user(s) name(s), location, address etc.
- Enter the text using the PC keyboard (maximum of 32 characters can be used).
If the characters shown on the display do not correspond to the ones typed on the keyboard, redefine your keyboard type. To do this, press **Esc** then **1** and select **P C k e y b o a r d**.
- Press **✓** to confirm.

You have now finished the getting started section. Press **Esc** to leave the Customise screen, then press **5** to quit the SETUP menu.

3. Programming guidelines

Only the Supervisor is allowed to program the Reagent and Method menus.

To select the Supervisor mode, press **Stop** for 3 seconds in the **Main window** and enter the Supervisor code. Press **5** (Exit) and select **Return in mode = Supervisor**.

*** IMPORTANT ***

For first time users, it is recommended to program the instrument as follows:

1. **Create the Karl-Fischer reagent** to be used during the titration.

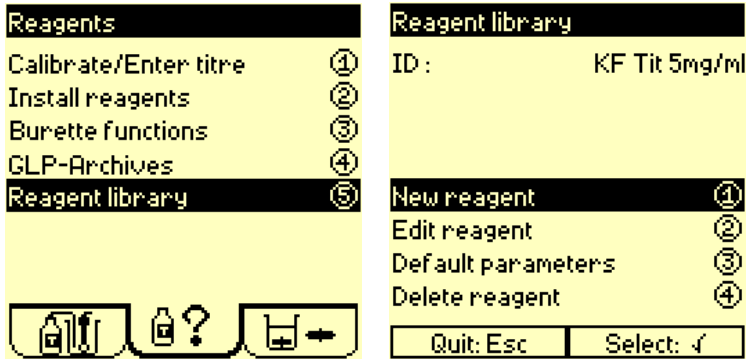
Then finally,

2. **Create the Karl-Fischer method**, which will consequently use the reagent created in the first step of programming.

Once you have finished programming, make sure that NO question mark "?" is displayed in the Reagent tab!

Creating a Karl-Fischer reagent

1. Press **5** **Reagent Library** then **1** **New reagent**.



2. Press **✓** in the **New reagent** screen.
3. Select **From = Other**.
The option From = Catalogue allows you to create a reagent from a list of commonly used reagents.
4. Press **✓** in the **ID** field and enter the reagent name (up to 16 characters).
5. Enter the "approximate" titre in mg/ml of the reagent (5 characters) in the **Target titre** field.
The reagent concentration unit is mg/ml (cannot be changed).
6. Press **1** twice to create the reagent.
7. Edit the reagent parameters (see next page).

Edit reagent screen

1. Press **5** **Reagent Library**.
2. Press **✓** and select the reagent to be edited from the list.
3. Press **2** **Edit reagent**.

Reagent library	
ID :	KF Tit 5mg/ml
New reagent ①	
Edit reagent ②	
Default parameters ③	
Delete reagent ④	
Quit: Esc	Select: ✓

4. Edit the necessary parameters.

Edit reagent KF Tit 5mg/ml	
ID :	KF Tit 5
Unit :	mg/ml
Address :	TIM / 1
Titre :	Calibrate
Change: ✓	

Edit reagent KF Tit 5mg/ml	
Calibration	
Autostart :	No
Periodicity :	2 day(s)
Number of tests :	1
Notification :	No
Change: ✓	

- a. **Address:**
Indicates the location of the burette containing the reagent: TIM/1 (position 1 on the Titration Workstation).
- b. Select **Titre = Enter** or **Calibrate**,
Select **Enter** if you already know the titrant concentration and do not wish to perform a calibration.
Select **Calibrate**, if you wish to perform a calibration. Enter the calibration parameters; see next page.

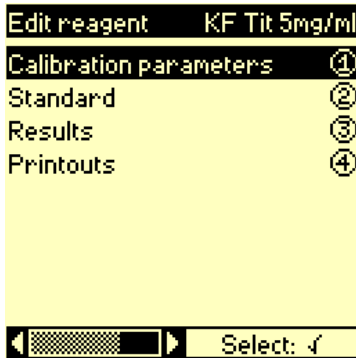
- c. Select how the titration will start after injection of the sample:
 - automatically by detection of a measurement change (select **Autostart = Yes**)
 - or manually. The titration will start after addition of the sample to the Karl-Fischer cell and keystroke on a validation key (select **Autostart = No**).
- d. Enter the **Periodicity**.

Indicates the maximum period of time between two calibrations. If the period of time has elapsed, calibrations can no longer be performed using this titrant.
- e. Enter the **Number of tests**.

This is the number of times the calibration method will be repeated, i.e. the number of beakers to prepare for the calibration.
- f. If you want a message to be displayed upon starting the calibration (example: place the standard in the cold zone of the oven), select **Notification = Yes** then enter the message (3 lines of 32 characters maximum).

Editing a Karl-Fischer reagent

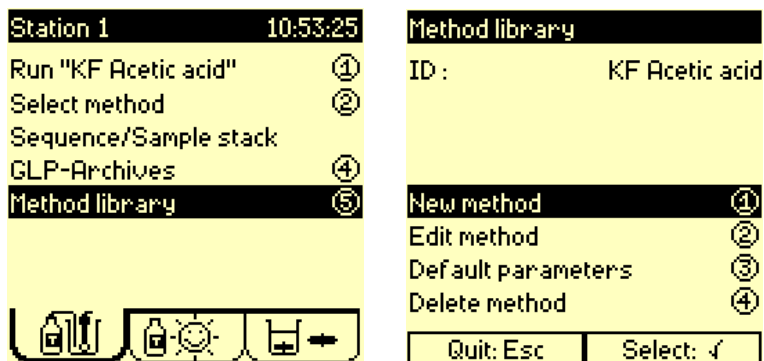
1. If `Titre = Calibrated`, enter the reagent definition parameters and go to the last `Edit reagent` screen.



2. Press 1:
To enter `Calibration parameters`: general parameters used during the calibration.
3. Press 2:
To enter `Standard` parameters concerning the standard solution used for the calibration.
4. Press 3:
To enter the `Results` parameters concerning acceptance criteria that you can set on the results.
5. Press 4:
To enter `Printouts` parameters defining the calibration report to be printed.

Creating a Karl-Fischer method

1. Press **5** Method library then **1** New method.



2. Press **✓** in the ID field.
3. Enter a method name (up to 16 characters).
4. Press **1**.
5. Edit the method parameters (see the next page).

Edit method screen

1. Press **5 Method Library**.
2. Press **✓**, select the method to be edited from the list then press **2 Edit method**.

Method library	
ID :	My method
New method	①
Edit method	②
Default parameters	③
Delete method	④
Quit: Esc	Select: ✓

3. Edit the necessary parameters.

Edit method	My method
ID :	My method
Number of tests :	1
Notification :	No
Autostart :	No
Blank :	No
QC sample :	No
◀	▶
◀	▶
Change: ✓	

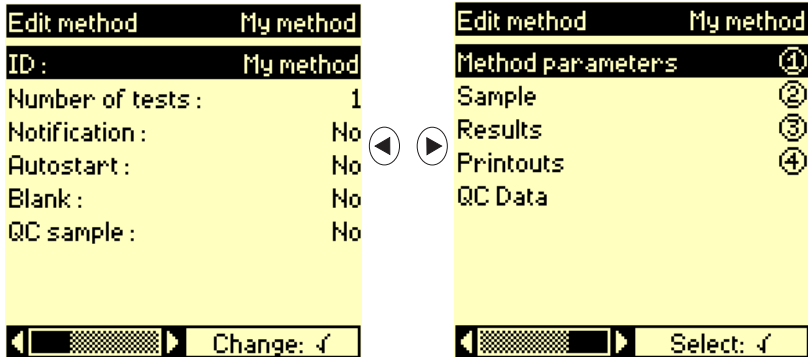
Edit method	My method
Method parameters	①
Sample	②
Results	③
Printouts	④
QC Data	
◀	▶
◀	▶
Select: ✓	

- a. Enter the **Number of tests**, i.e. the number of times the method is to be repeated for the same sample.
- b. If you want a message to be displayed upon starting the method (example: place the standard in the cold zone of the oven), select **Notification = Yes** then enter the message (3 lines of 32 characters maximum).

- c. Select how the titration will start after injection of the sample:
 - automatically by detection of a measurement change (select **Autostart = Yes**)
 - or manually. The titration will start after addition of the sample to the Karl-Fischer cell and keystroke on a validation key (select **Autostart = No**).
- d. Blank: A blank or blank sample is usually a solvent used to dissolve or dilute the sample. This blank may contain traces of water. Select **Yes** for **Blank** when you want to subtract the volume of titrant used to titrate the solvent from the volume found for the dissolved or diluted sample.
- e. QC sample: the concentration of a QC sample is known accurately and the composition is close as possible to that of the samples to be analysed. QC measurements enable you to perform quality control tests on the method used. Refer to the Reference Manual for more information concerning this option. Select **Yes** for **QC sample** to perform measurements on QC samples.

Editing a Karl-Fischer method

1. Go to the last Edit method screen.



2. Press 1:
To enter the **M e t h o d p a r a m e t e r s**: general parameters concerning the reagent (when required) used by the method and the titration parameters.
3. Press 2:
To enter the **S a m p l e** parameters: concerning the preparation of the sample to be analysed.
4. Press 3:
To enter the **R e s u l t s** parameters defining the results, the acceptance criteria that you can set on the results.
5. Press 4:
To enter the **P r i n t o u t s**: parameters defining the analysis report to be printed.
6. Press 5:
To enter the **Q C d a t a** (only available when QC sample = Yes): quality control parameters required when using QC samples.

4. Running analyses

* IMPORTANT *

Before pressing the **Run** key, check the following points listed below:

1. Select the method by pressing **2** in the Main window or select the sequence by pressing **3** in the Main window.
If you want to run a sequence, the sample changer and the sample parameters must be defined in the Configuration menu. Contact your supervisor if necessary.
2. If a **Question mark "?"** is present in the reagent tab.
Programming error due to missing reagent parameters. Contact your supervisor.
3. Prepare the Karl-Fischer cell. *Refer to the Karl-Fischer Installation guide or Model 375 Installation form.*
4. **Connect** the double metal electrode to the **Pt-Pt** socket of the Titration Workstation.
5. **Install reagent(s).**
6. Before running analysis or between sample runs, you can activate the Stand by function in order to maintain permanently the cell ready for analysis. Press **2** in the Cell window.
7. **Run the analysis** when a Sunny icon is visible in the reagent tab.
8. **Run a reagent calibration** when a Stormy icon is visible in the reagent tab.
9. If you are unable to display the "Run" command due to the presence of a Stormy icon in the reagent tab, **activate the "Check" command**. The Titration Workstation will automatically guide you through the necessary operations required to solve the problem(s).

Run reagent calibration

1. Select the method.
2. Connect the double metal electrode to the **Pt-Pt** socket of the Titration Workstation.
3. Install the reagent to be calibrated.
4. Enter the **Reagents** window.
5. Select **1 Calibrate / Enter titre**. Press **✓** and select the reagent from the proposed list.
6. Press **1** to start the calibration.

Run Karl-Fischer method

1. Select the method.
2. Connect the double metal electrode to the **Pt-Pt** socket of the Titration Workstation.
3. Install the reagent to be used to perform the analysis.
4. Display the Main window and press **1** to start the analysis.

Run sequence with a sample changer

Refer to the Reference Manual of the Titration Workstation, topics "Running a sequence with a sample changer".

1. Select the sequence.
2. Install the sample changer and connect it to the **SAC** socket of the Titration Workstation using the cable, part no. A95A202.
Refer to the User's Guide of the sample changer.
3. Connect the double metal electrode to the **Pt-Pt** socket of the Titration Workstation.
4. Install then calibrate the reagent to be used to perform the analysis.
A Karl-Fischer titrant calibration cannot be part of a sequence.
5. Prepare the sample stack. Inject the sample in each beaker being analysed.
6. Display the Main window and press **1** to start the analysis.

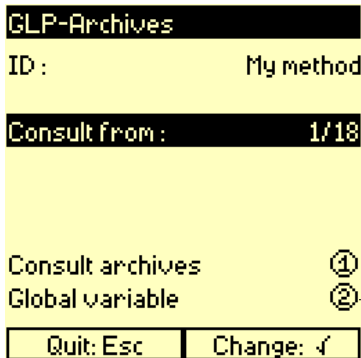
5. Viewing data

How to access?

The GLP-Archives (Good Laboratory Practice) command is available in each window:

- **M a i n**: press **4** to access,
- **R e a g e n t s**: press **4** to access.

The **G L P - A r c h i v e s** window displays the method or reagent ID with the expiry date (reagent).



Press **✓** and enter the result number from where you want to start visualising the results. Example: result no. 1 out of 18 results stored for the method selected.

Press **1** to consult. The following pages, give a summary of the information available in the **M a i n** and **R e a g e n t s** windows.

Press **2** to consult the global variables. Refer to the last page of this chapter.

Sample results

The last 200 sample results are saved in the archives.
 Once you have selected the method and the result (see previous page),
 the following data are displayed:

<i>Result no. 1 / 18</i>		<i>Result no. 2 / 18</i>	
My sample	◀1/18▶	My sample	◀2/18▶
Type :	Sample	Type :	Sample
26 Sep 2006	11:38:13	26 Sep 2006	11:37:30
User :	My name	User :	My name
Average on 2 tests	TIM	Test : 2	TIM
OK		OK	Accepted
Results ① ◀ ▶		Results ① ◀ ▶	
Quit: Esc	Select: ✓	Quit: Esc	Select: ✓

18 is the number of results saved for the selected method.

Scroll the results.
 The results can be: Test results (Rx) or Average ± standard deviation calculated on several tests of the same sample.

1

My sample	1/18
Water content :	1.1411 ± 0.050
	mg/ml
Quit: Esc	OK: ✓

Mean and standard deviation calculated on two accepted test results.

1

My sample	2/18
Water content :	1.1812
	mg/ml
Drift :	2µg/min
Quit: Esc	OK: ✓

Result of test no. 2 (test accepted).
 Drift determined and saved for the sample test.

Reagent calibration results

The last 100 reagent calibration results are saved in the archives. Once you have selected the reagent then the result (see first page of this chapter), the following data are displayed:

Result no. 5 / 9		Result no. 6 / 9	
KF Tit 2mg/ml	◀5/9▶	KF Tit 2mg/ml	◀6/9▶
Batch no. :		Batch no. :	
Standard: Sodium Tartrate		Standard: Sodium Tartrate	
21 Sep 2006	13:51:56	21 Sep 2006	13:51:56
User : My name		User : My name	
Average on 2 tests	TIM	Test : 2	TIM
OK	Accepted	OK	Accepted
Results	①	Results	①
Quit: Esc	Select: ✓	Quit: Esc	Select: ✓

9 is the number of results saved for the selected reagent.

Scroll the results.
 The results can be: reagent titre entered by the operator, test performed on a standard, mean calculated on several tests performed using the same standard or the current calibration data.

①

KF Tit 2mg/ml		5/9
Titre :	2.042	± 0.24mg/ml
Quit: Esc		
OK: ✓		

Mean and standard deviation calculated on 2 tests performed and accepted on the same standard.

①

KF Tit 2mg/ml		6/9
Titre :	2.0543	mg/ml
Drift :	2	µg/min
Quit: Esc		
OK: ✓		

Titre result of test no.2 (test accepted).
 Drift determined and saved for the standard test.

Global variables

To view the G1 to G10 global variables:

- Enter the Main window.
- Press 4 (GLP-Archives).
- Press 2 (Global variable).

<i>Global variable G1</i>		<i>Global variable G2</i>	
Global variable	◀1/10▶	Global variable	◀2/10▶
G1		G2	
Unit :	mg/ml	Unit :	%
	2.1669		5.2041
27 Sep 2006	17:43:05	27 Sep 2006	17:43:05
Method :	My method	Method :	My method
Result :	Water content	Result :	R2
Quit: Esc		Quit: Esc	

Scroll the G1 to G10 global variables.

6. Printing data

*** IMPORTANT ***

Before printing, it is necessary to perform the following:

1. **Enter the Setup window:** press **Stop** 3 seconds in the **Main** window.
2. **Select the Printer**
Press **1**.
In **Configuration**, select **Printer = 80 columns** and **Format = Listing or Page by Page**.
3. **Enter User ID** (if required)
In **Configuration**, select **User ID = Yes**. You will be prompted to enter a user ID at the start of a run method. This ID will appear on the printouts.
4. **Customise the printout** (if required)
In **Configuration**, press **3**.
In **Customise**, enter the name of your workstation (max. 4 lines of 32 characters). This information will appear as a header at the start of the printout.
5. **For automatic printout - select a condensed or detailed printout**
In the **Printouts** screen of the **Edit method/reagent**, select **Detailed = High** to obtain a full detailed printout.
Select **Low** for condensed printout.

Manual printouts

Method library

Press Print , in the Main window to give you an overview of the methods available in the method list.

Denver Instrument 1401 17th St. Suite 750 Denver, Colorado 80202 800.321.1135	14 Dec 2007 - 10:59:19 Denver375 - XXXXXXXXXXXXX
	Method list
Method : KF Acetic acid Reagent : KF Tit 2mg/ml	
Method : KF Ketone Reagent : KF Comp K 5mg/ml	
Method : KF Melamine Reagent : KF Tit 2mg/ml	
Method : KF Salicylic Reagent : KF Tit 2mg/ml	
Method : KF Skin cream Reagent : KF Tit 5mg/ml	

Reagent library

Press Print , in the Reagent window to give you an overview of the reagents available in the reagent list.

Edit method data

In the Main window, press 5 Methodlibrary then Print to give you an overview of the parameters of the current programmed method. These are the parameters entered in the Editmethod screen (press 2 to access).

Denver Instrument 1401 17th St. Suite 750 Denver, Colorado 80202 800.321.1135		14 Dec 2007 - 11:03:36 Denver375 - XXXXXXXXXXXX	
		Method : KF Acetic acid	
No. of tests	: 1	Autostart	: Yes
QC sample	: No	Blank	: No
PARAMETERS			
Reagent	: KF Tit 2mg/ml	Current value	: 50 µA
Current	: AC	Start timer	: 00min00s
Threshold drift	: 50 µg/min	Maximum speed	: 15.00 ml/min
Maximum volume	: 10.0 ml	Max. titration	: 5min0s
Min. titration	: 30s		
Auxiliary output	: No		
Addition	: No		
End point	: 200.0 mV		
SAMPLE			
Dilution	: No		
Sample amount	: 2.0000 ml		
RESULT			
No. of results	: 1	No. of equations	: 0
Accept. criteria	: No	No. of digits	: 5
Results factor	: No		
Result Water content			
Result unit	: mg/ml		
Global variable	: No		
PRINTOUTS			
Title	: Analysis bulletin		
Detailed level	: Medium		
Curve	: Yes		

Edit reagent data

Press 5 Reagent library in the Reagent window then Print to give you an overview of the parameters of the current programmed reagent. These are the parameters entered in the Edit reagent screen (press 2 to access).

Automatic printouts

The Print key is inactive during a titration or a reagent calibration.

The results obtained during a "Run" are printed automatically.

Depending on the option selected for Detailed in the Edit method/reagent - Printout window, you will obtain different types of printouts.

Example of a printout

Header : information entered in the Customise screen of the Setup window.

Title of report : entered in Printouts screen during method editing

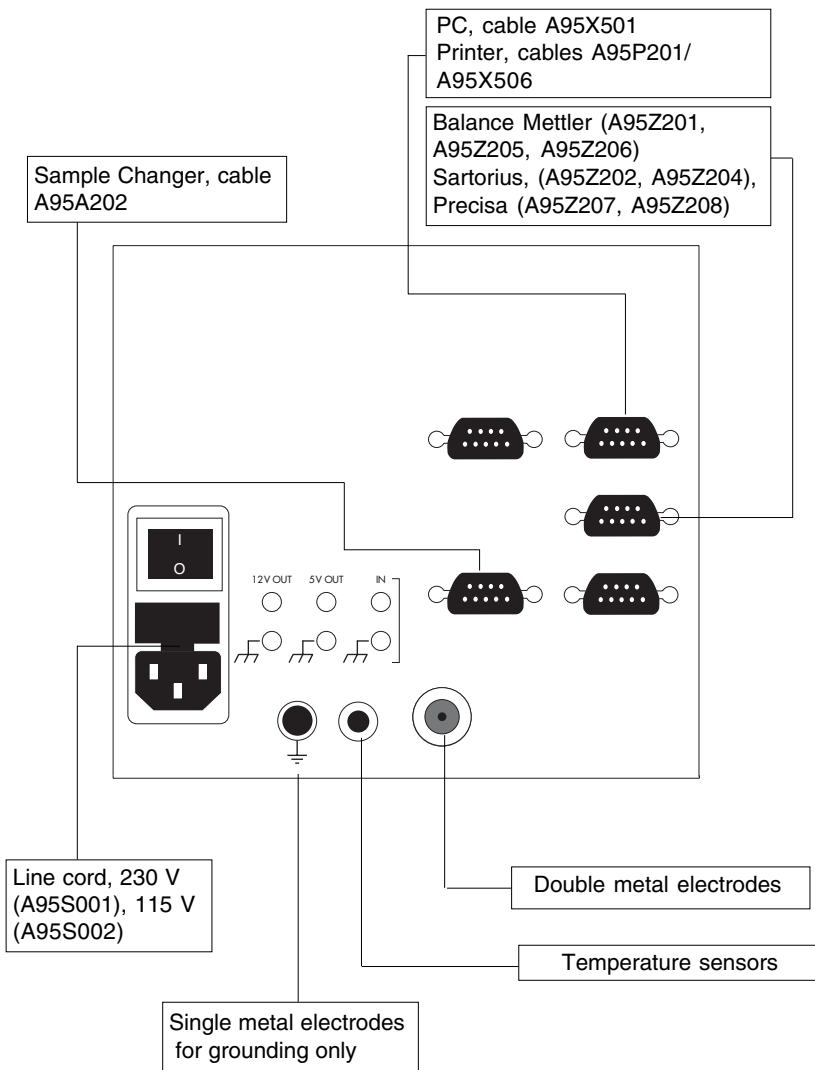
Denver Instrument 1401 17th St. Suite 750 Denver, Colorado 80202 800.321.1135		14 Dec 2007 - 13:05:00 Denver375 - XXXXXXXXXXXX	
		Analysis bulletin : KF Acetic acid	
User	: HW		
Sample ID	: Sample no. 10		
Burette serial n°	: 040-01	Batch no.	: BN 012
Reagent	: KF Tit 2mg/ml	Entered the	: 14 Dec 2006
Titre	: 1.9985 mg/ml	Serial number	:
Certificate no.	: CH 152		
Electrode	: M231P12-a		
8			
Test no. 1	: 1.9800 ml		
Result accepted	Time : 13h06	Duration :	45s
Drift	: 2 µg/min		
Water content	: 1.2082 mg/ml	(1.197 ml)	OK
9			
Test no. 2	: 2.1200 ml		
Result accepted	Time : 13h08	Duration :	1min2s
Drift	: 2 µg/min		
Water content	: 1.0955 mg/ml	(1.162 ml)	OK
Sample no. 10		Average on 2 tests / 2	
Final result			
Water content : 1.1518 s 0.071 mg/ml			OK

Analysis ID : User ID and Sample ID entered at the start of the titration (if option selected during editing)

Titration results : obtained at the end of the analysis

Calibration data : of the reagent used to perform the titration

7. Connection of peripherals



8. General information

Cleaning

The Titration Workstation requires minimum maintenance. The exterior surface can be cleaned with tepid water and wiped dry with a soft cloth. Never use another solvent unless you have first consulted your Denver Instrument representative

Transporting the instrument

Always use the packaging supplied by the manufacturer.

IMPORTANT!

Remove the metal rod before transporting the instrument.

Never pick-up or carry the instrument by the metal rod.

Servicing

DO NOT ATTEMPT TO SERVICE THIS PRODUCT YOURSELF, except as noted in the Reference Manual. For servicing, please contact your **Denver Instrument service representative** at the address given below:

Denver Instrument Company
1401 17th Street, Suite 750
Denver, CO 80202
303-431-7255
303-423-4831 FAX
www.denverinstrumentUSA.com

or your local service representative:

International Standards



The Model 375 is in conformity with the provisions of:

- Low voltage directive 73/23/EEC, dated 19/2/73,
- EMC directive 89/336/EEC, dated 3/5/1989, 92/31/EEC, dated 28/4/1992,
- CE harmonisation directive 93/68/EEC, dated 22/7/1993.

following standards and severity levels of:

- EN 61010-1, 1995,
- EN 55011 (radio frequency interference) 1991, class A,
- EN 61000-3-2, 1995, class A,
- EN 61000-3-3, 1995,
- EN 61000-4-2, 1995, level 2 (4kV) with contact discharges and level 3 (8kV) with air discharges,
- EN 61000-4-3, 1996, level 1 (1V/m),
- EN 61000-4-4, 1995, level 2 (1kV) on AC power line and level 2, (0.5kV) on I/O signals,
- EN 61000-4-5, 1995, level 2,
- EN 61000-4-6, 1996, level 1 (1V),
- EN 61000-4-11, 1994.



The Titration Workstation complies with the following standards:

UL 61010A - 1

CAN / CSA C22 2 N° 1010.1 - 92.

