Operating Instructions

Sensistor® Sentrac®

Hydrogen Leak Detector

Type number: SEN.122.162, SEN.122.163

From software version

2.01.01

INFICON

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Table of Contents

1 General Information

Read this Manual carefully before putting your instrument into service. When reading, pay particular attention to the WARNINGS, CAUTIONS and NOTICES found throughout the text.

1.1 About this Document

The purpose of this manual is to:

- Describe the working principle of the instrument

- Teach the reader how to set up the instrument

- Show examples of different ways of testing and locating leaks

1.1.1 Related Manuals

Manual	Part no.
Sensistor Sentrac Quick Start Guide	592-012

1.1.2 Document History

Revision	Date	Remark
a	09-2014	First public release
02	07-2015	Second public release
03	11-2015	Third public release
04	01-2019	Fourth public release
05	10-2020	Fifth public release

1.2 Introduction to the Instrument

The instrument can be used to detect the presence of a leak, where on the test object the leak is located and how much it is leaking.

1.2.1 Intended Use

- The instrument is designed for indoor use only.

- The instrument can be setup via the touchscreen or via PC.

- Different sets of parameters can be saved. Each set forming a specific recipe for a specific test object.

1.2.2 Available Models
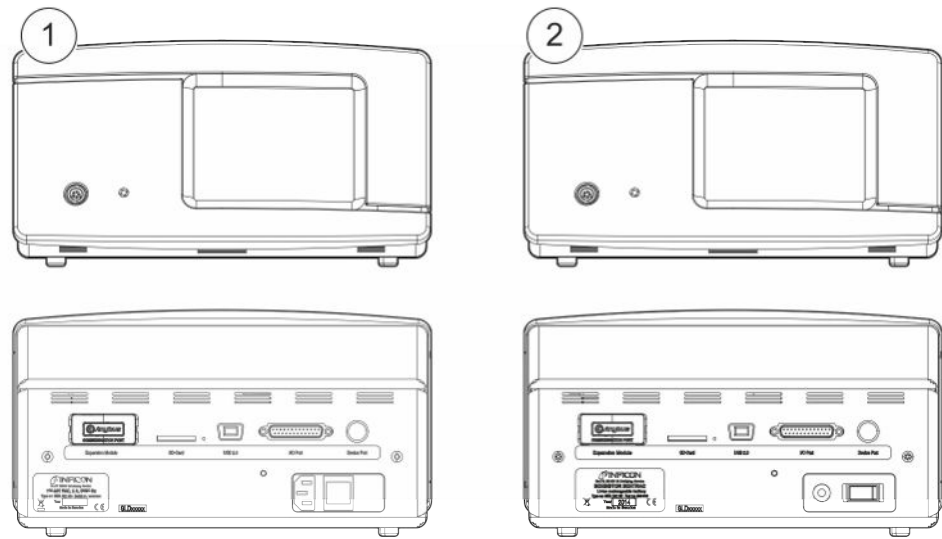
Fig. 1: Available Models

Sensistor Sentrac			Part no.
1	Sensistor Sentrac, desktop model	For stationary use	590-900
2	Sensistor Sentrac, portable model	12 hours operating time on batteries	590-910

1.3 Password Menu

All menus except the service menu are available when no basic, intermediate, or advance password is set. If any of these passwords are set by the user, the following menus will be accessed with the respective password.

1.4 Warnings

⚠ **DANGER**

Imminent threat resulting in death or serious injuries

⚠ **WARNING**

Hazardous situation resulting in potential death or serious injuries

⚠ **CAUTION**

Hazardous situation resulting in minor injuries

NOTICE

Hazardous situation resulting in damage to property or the environment

NOTICE

2 Equipment and Storage

> When receiving the equipment, check that it has not been damaged during transport.

2.1 Supplied Equipment Desktop Model
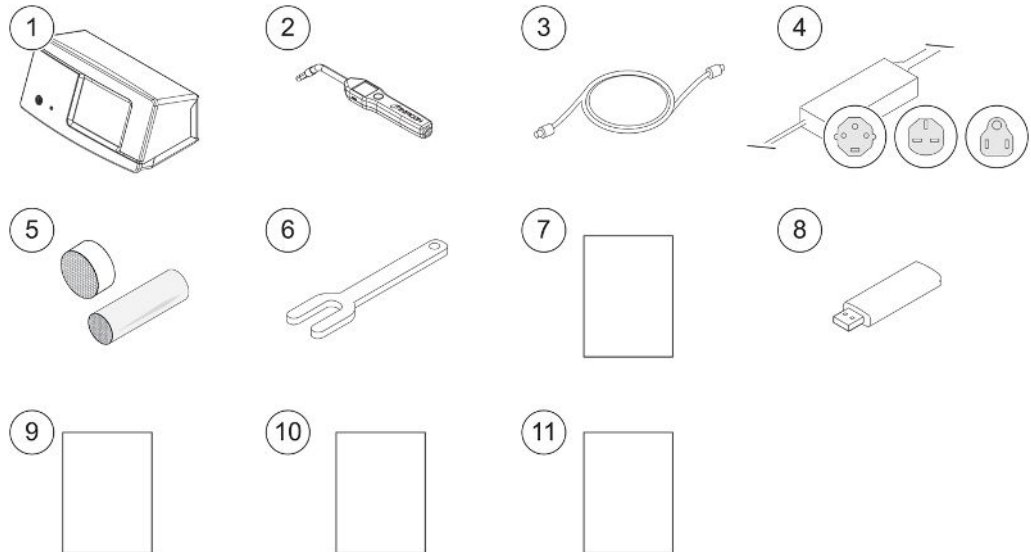
Pos.	Part	Part no.
1	Instrument Unit Desktop Model	590-905
2	Hand Probe P60	590-890
3	Probe Cable (3 m)	590-161
4	Mains cord (Desktop Model)	
	EU	591-146
	UK	591-147
	US	591-853
5	Sample Kit Probe Tip	591-799
6	Sensor Key	598-147
7	Operating Manual instrument (this manual)	592-010
8	Translations of the manual (USB)	
9	Return Product Condition Report	
10	Instrument Test Record	
11	Quick Start Guide	592-012

2.2 Supplied Equipment Portable Model
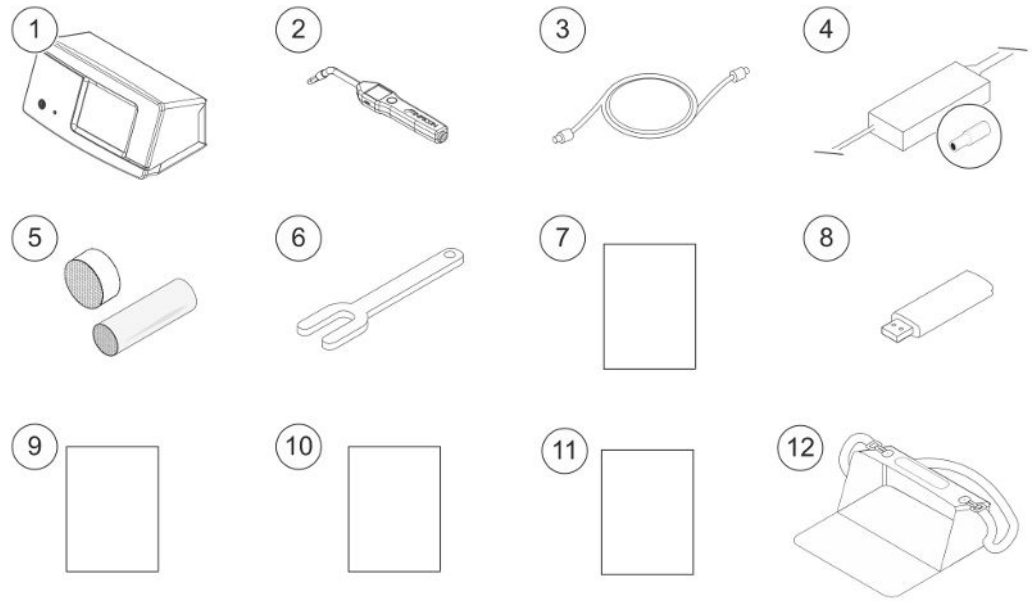
Pos.	Part	Part no.
1	Instrument Unit Portable Model	590-915
2	Hand Probe P60	590-890
3	Probe Cable (3 m)	590-161
4	Battery Charger	591-795
5	Sample Kit Probe Tip	591-799
6	Sensor Key	598-147
7	Operating Manual instrument (this manual)	592-010
8	Translations of the manual (USB)	
9	Return Product Condition Report	
10	Instrument Test Record	
11	Quick Start Guide	592-012
12	Carrying Case	591-993

2.3 Peripheral Equipment
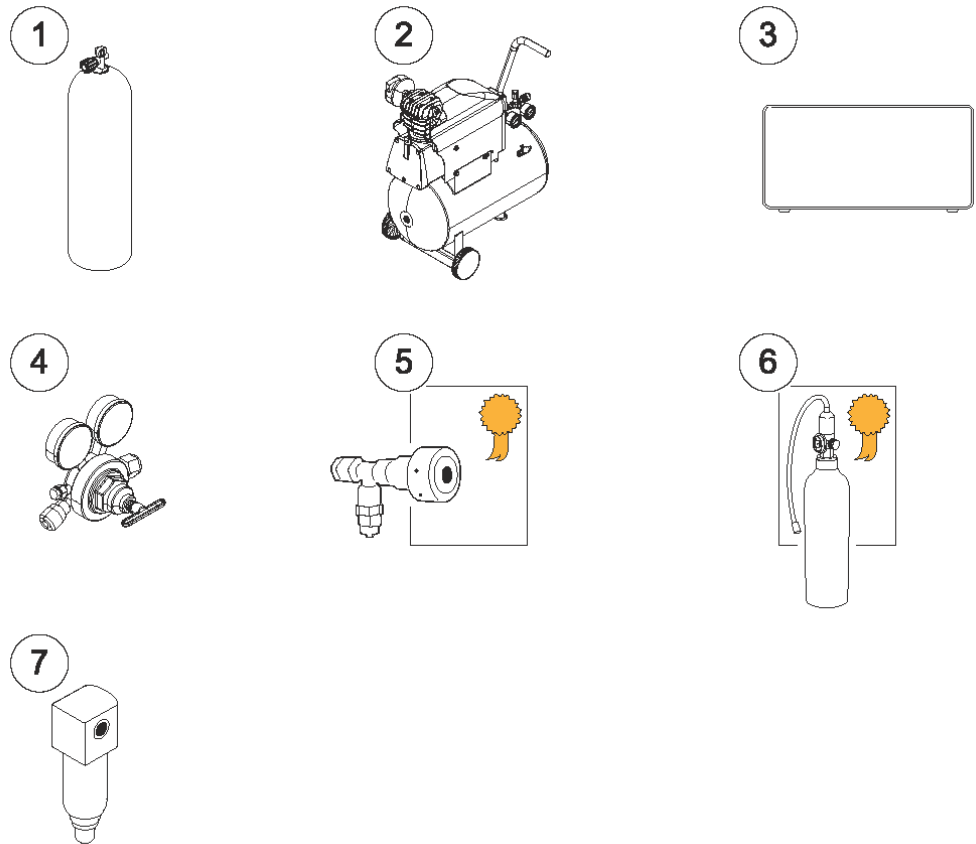
Pos.	Part
1	Tracer gas
2	Compressed Air
3	Tracer Gas Filler
4	Two-Step Gas Regulator
5	Calibration Leak with Certificate
6	Calibration Gas with Certificate
7	Compressed Air Filter

For more information, see Spare Parts [▶ 69].

2.4 Storage Environment Sensistor Sentrac

Desktop Model	(590-900)
Temperature:	0°C - 45°C (32°F - 113°F)
Humidity Range:	10% to 75% RH (non-condensing)
Portable Model	(590-910)
Temperature:	0°C - 45°C (32°F - 113°F)
Humidity Range:	10% to 75% RH (non-condensing)

For long storage period we strongly recommend that the power supply battery is charged only to 50% of full charge to keep high charging capacity level for long time.

3 Instrument Description

The instrument is manually controlled by the touchscreen menu system. The screen also shows results and sequence graphically and in plain text.

3.1 Front View
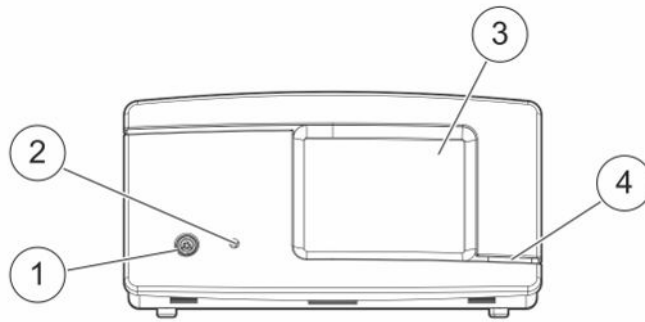
Pos.	Port/Interface
1	Probe Connector Port
2	Earphone Jack
3	Touchscreen
4	LED Lamp

3.2 Rear View
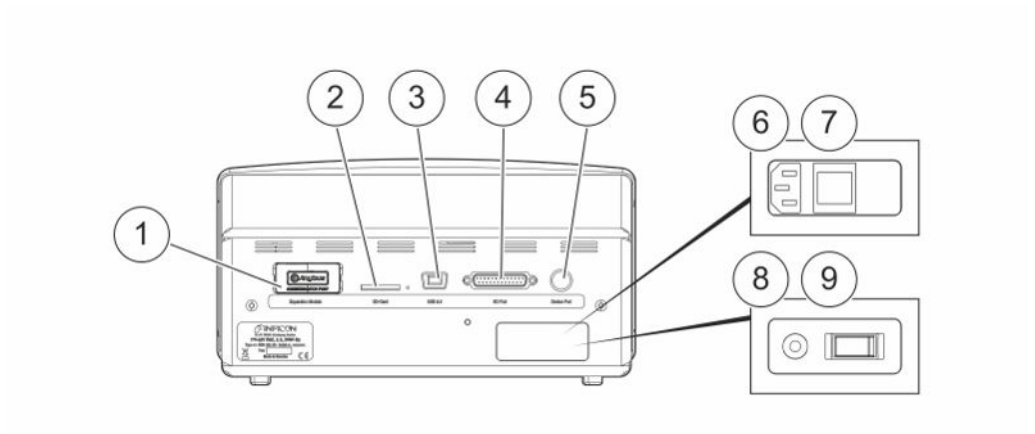
Pos.	Port/Interface	Connect
1	Not used	-
2	SD Card Slot	SD Card
3	USB 2.0	To a host (for example PC)
4	I/O-connector	RS232, PLC I/O and signals.
5	Probe Connector Port	Probe
6	Power Input (Desktop Model)	Power Cable
7	Power Switch (Desktop Model)	-
8	Power Input (Portable Model)	Battery Charger
9	Power Switch (Portable Model)	-

3.3 Labels

At the rear side of the instrument, a label indicates the electrical specifications of the instrument and its serial number.
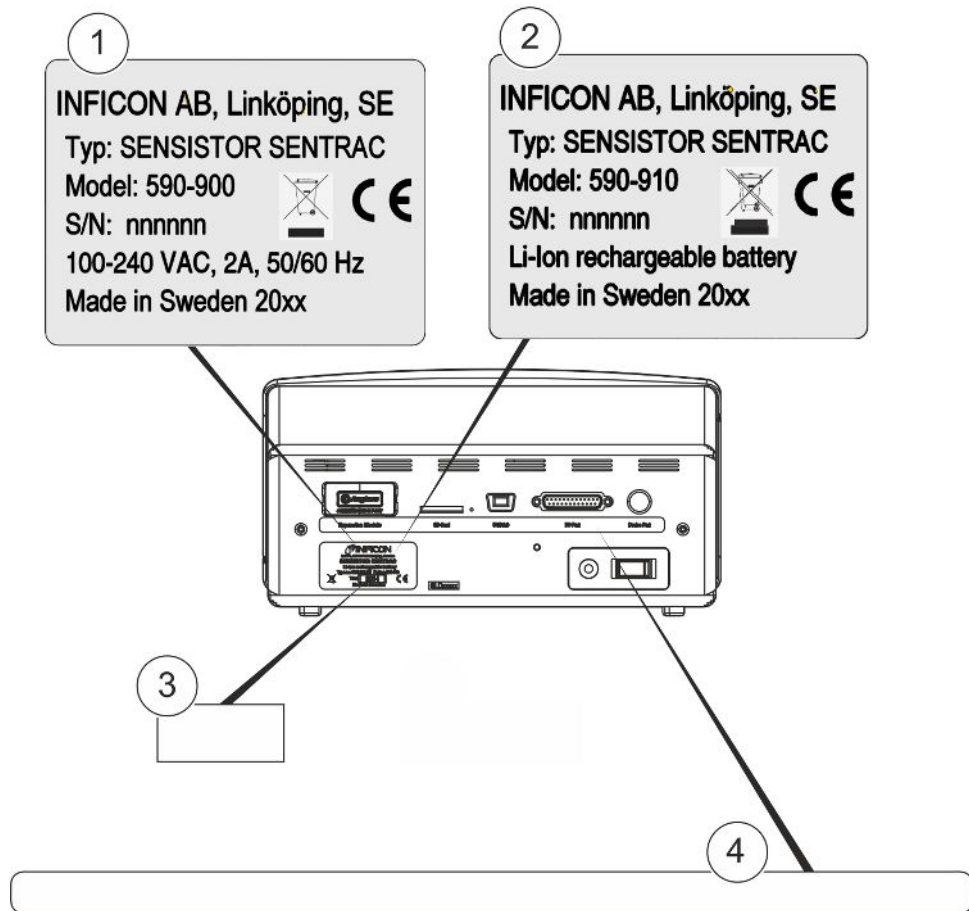
Pos.	Labels
1	Device Plate Desktop Model
2	Device Plate Portable Mode
3	Manufacturing Year Label
4	Connections Label

SEN. 122.162	Type number Desktop Model
SEN. 122.163	Type number Portable Model
	WEEE symbol. See Disposing of the Instrument [▶ 73].
	CE marking. Conformity with the essential health and safety requirements.

4 Hand Probe

NOTICE
Do not expose the probe to a hydrogen concentration as large as 5% when the instrument is not powered on, as this could damage or destroy the probe gas sensor.

NOTICE
Connection and disconnection of the sensor cable must be done with power off. Sensor can be damaged if power is on.

ℹ️ The Hand Probe is a no-flow probe. Gas sensing takes place in the replaceable sensor located in the tip of the probe.

4.1 Description
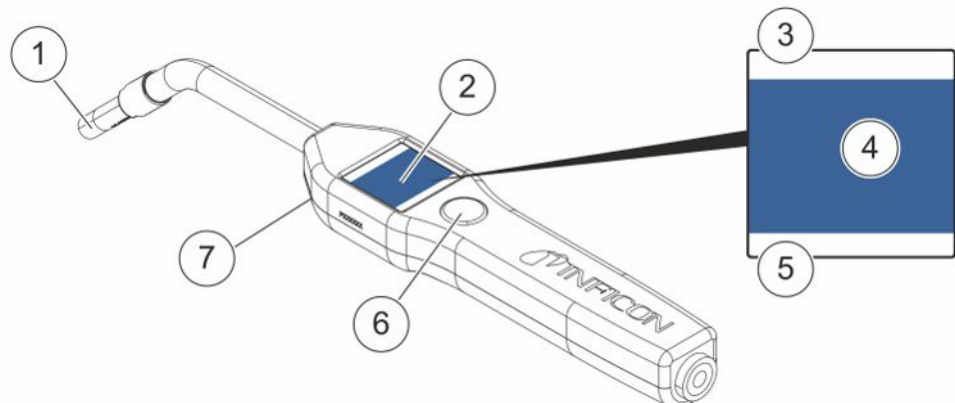
Pos.	Part	Description
1	Hydrogen Sensor	Detects and measures leaks.
2	Display	Displays results, information and warnings.
3	Current Leak Detection Mode	Shows which mode the leak detection is performed in.
4	Measuring and locating information	Shows by value and graphics.
5	Function Button function	Shows available function.
6	Function Button	Performs available function.

Pos.	Part	Description
7	Lamp	Lights up the measuring surface.

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i   The probe can be ordered with a flexible neck.

For more information see Spare Parts [▶ 69].

4.2 Calibration

The probe must be calibrated for optimal accuracy. Make sure it is calibrated before using it to measure gas concentration or leak rate value. For more information see Calibration [▶ 37].

5 System Examples

5.1 Desktop Model
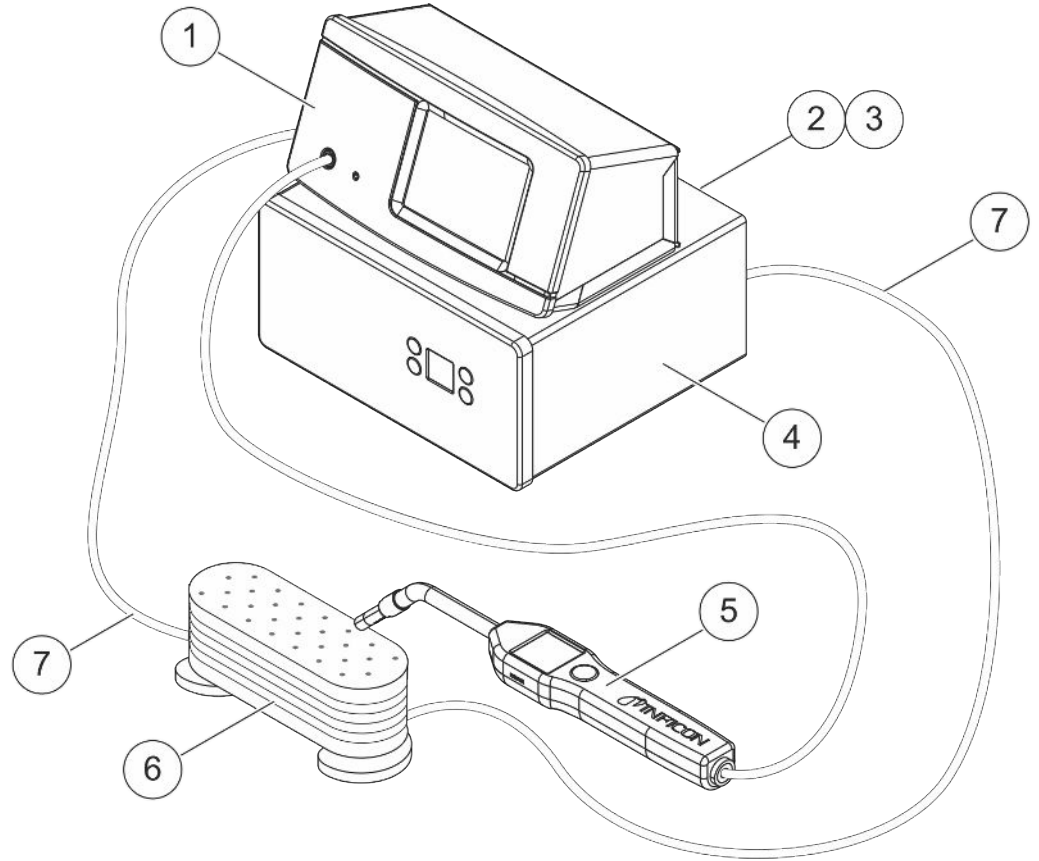
Pos.	Description
1	Sensistor Sentrac Desktop Model
2	Compressed Air
3	Tracer Gas
4	Tracer Gas Filler e. g. TGF11
5	Hand Probe
6	Test Object
7	Evacuation and Gas Filling

5.2 Portable Model
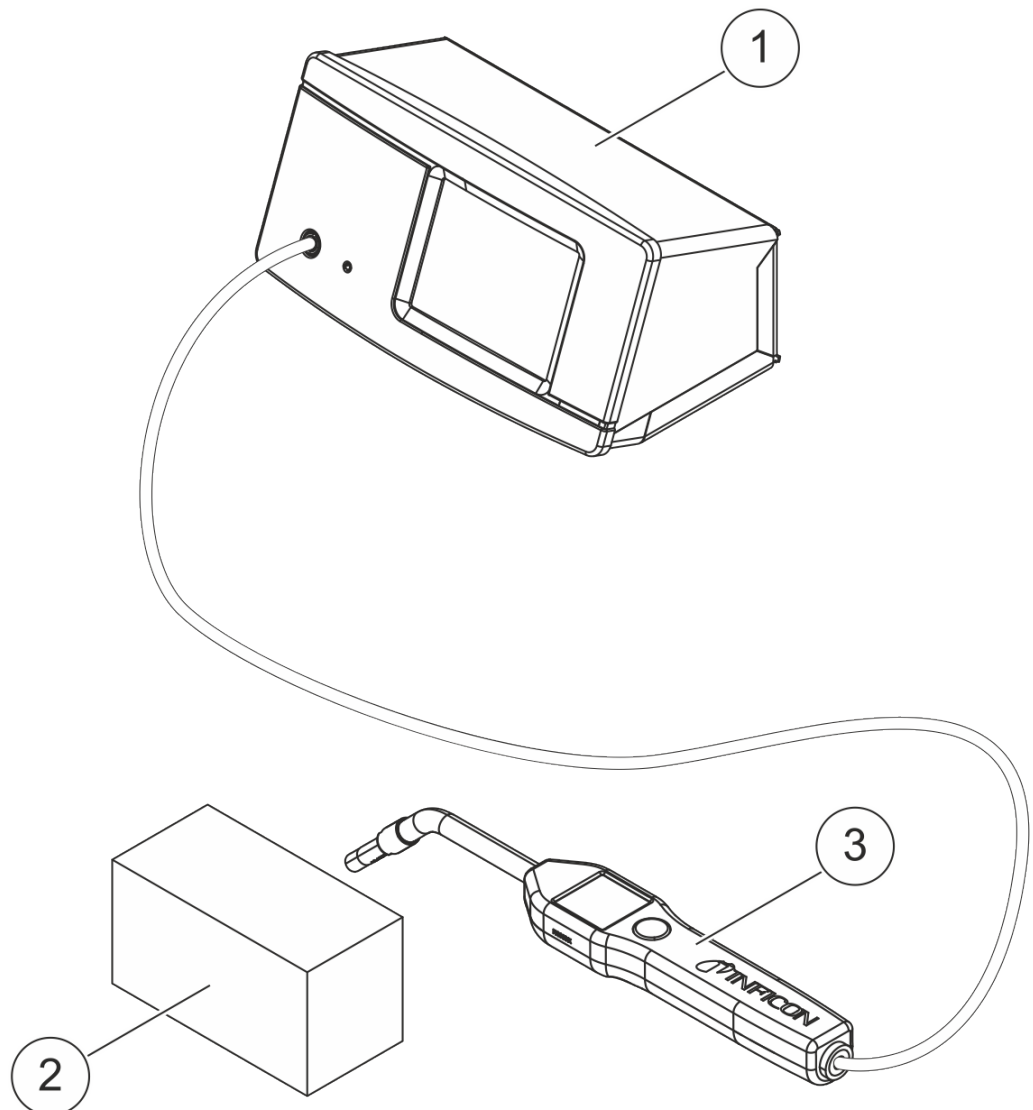
Pos.	Description
1	Sensistor Sentrac Desktop Model
2	Test Object
3	Hand Probe

6 Setup

⚠ WARNING

Make sure all relevant legislation and safety standards are complied with before putting the instrument into service.

6.1 Placement of the Instrument
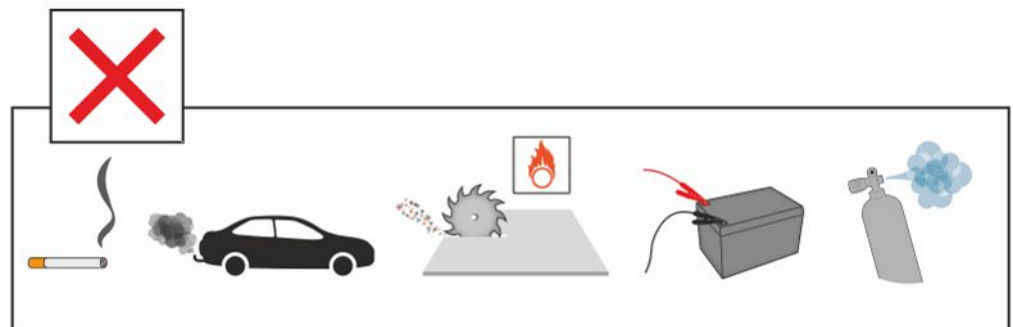
Avoid to place the instrument close to hydrogen sources such as cigarette smoke, combustion engines, aluminium machining, lead battery charging stations and, in some cases, compressed air systems.

6.2 Connect the Instrument

1. Connect the Hand Probe to the instrument using the probe cable. If you have purchased another type of probe than the Hand Probe P60, contact INFICON for help. Adaptation equipment between probe and instrument may be required.

2. Plug the power cable into the power inlet of the instrument and into the nearest power socket.

ⓘ To disconnect the Probe, hold around the knurled part of the connector and pull straight out. The standard cable length is 3 m. Several different cable lengths are available. See Spare Parts and Accessories [▶ 69].

7 Settings

7.1 Probe Settings

► To set the probe button functions, click Settings > Probe > Functions.

The lamp options can also be set here.

7.2 General Settings

► To set brightness, sound, date and language, click Settings > General.

7.3 Communication Settings

In Communication Settings the outgoing ports can be configured.

► Click Settings > Communication.

USB and RS232

Data can be printed during specific intervals or at specific events. The printed data are in scientific format.

PLC Out

PLC Out is set high when a selected event occurs and stays high during the event.

PLC In

High signal on PLC In triggers a set function.

Ana. Out

Generates an analog voltage, 0.15V to 10.0V, with a resolution of 8 bits between set values of Measuring Mode.

8 Menu System

8.1 Instrument Display

8.1.1 Menu Navigation

NOTICE
Do not cause any damage by sharp objects on the instrument touchscreen.
INFICON recommends using the fingertip for touching the touchscreen.

Icon colors		
Grey	Non clickable	Shows top screen in current menu.
Light blue	Clickable	Click to enter menu.
Super light blue	Clickable	Click to return to the top screen in current menu.

Operation Screen

Settings Screen

CALIBRATION	RECIPE
LOCATING MODE	GENERAL
MEASURING MODE	COMMUNICATION
PROBE	PASSWORD

Settings

Info Screen

STATISTICS	I/Os
EXPORT / IMPORT	SHOW PASSWORDS
SETTINGS OVERVIEW	ABOUT

Info

Diagnosis Screen

WARNINGS	FACTORY DEFAULT
SERVICE SCREEN	

Warnings
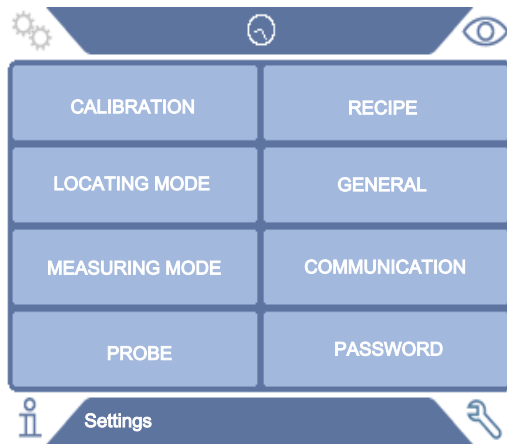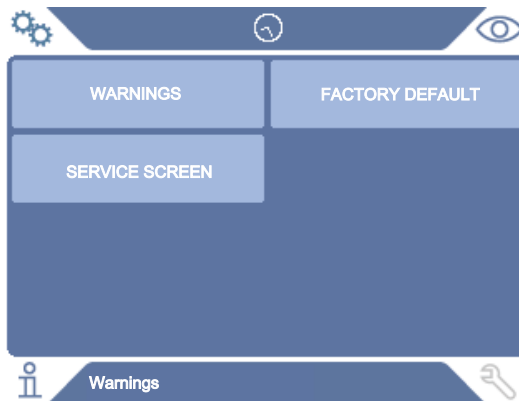
8.1.2 Menu Buttons

Icon	Description	Icon	Description
⚙	Settings	◁	Audio
👁	Operation	◁̸	Mute
ℹ	Info	⏱	Sensitivity
🔧	Diagnosis	⊕	Calibration
1.23	Measuring Mode	⚗	Recipe
▮	Locating Mode	⋰	I•Guide
▨23	Combined Mode		

8.1.3 Navigation and Other Buttons

Icon	Description	Icon	Description
▶	Start	⤓	Save
⊗	Stop, Close	⤒	Load
‹	Backward	◇	Scrollbar
›	Forward		Shift
▶▶❘	Next	⌫	Back

8.2 Passwords and Menu Overview

There are three different levels of access, indicated by the respective user icon below.

Icon	Description
👤	Basic.
	The password can be set to access basic level
	Basic users can operate the instrument, but not calibrate or change settings. No password.
👤	Intermediate.
	The password can be set to access intermediate level.
	Intermediate users can calibrate the instrument, but not change settings, edit or review logs.
👤	Advanced.
	The password can be set to access the advanced level.
	Advanced users can operate, calibrate, change settings, edit or review logs.

If the password is not set, the user can operate, calibrate, change settings, edit or review logs.

Passwords and Menu Overview

All menus except the service menu is available when no Basic, Intermediate-, Advance-password is set. If any of these passwords are set by the user, the following menus will be accessed with respective password.

The first tab Login is used for logging into the different access levels.

Under the tab "Intermediate" the Password can be set to access Intermediate level. Under the tab "Advance" the Password can be set to access Advance level.

Menu Level 1	Menu Level 2	Tabs	Password		
			Basic	Inter-mediate	Advance
Operation	Measuring Mode		X	X	X
	Locating Mode		X	X	X
	Combined Mode		X	X	X
	Battery		X	X	X
	Audio		X	X	X
	Calibrate			X	X
	Sensitivity		X	X	X
	Recipe		X	X	X

Menu Level 1	Menu Level 2	Tabs	Password		
			Basic	Inter-mediate	Advance
	I•Guide		X	X	X
Settings	Calibration	Calibrate		X	X
		Setup 1			X
		Setup 2			X
		Interval			X
		Info			X
	Locating Mode	Sensitivity			X
		Misc			X
	Measuring Mode	Unit			X
		Gas			X
		Reject			X
		Misc			X
		I•Guide			X
	Probe	Functions			X
	Recipe				X
	General	Display			X
		Time/Date			X
		Misc			X
	Communication	USB			X
		RS232			X
		PLC Out			X
		PLC In			X
		Ana. Out			X
	Password	Login	X	X	X
		Intermediate		X	X
		Advanced			X
Info	Statistics	Run Time	X	X	X
		Calibrations	X	X	X
		I•Guide	X	X	X
	Export/Import	Export			X
		Import			X
	Settings overview		X		X
	I/O		X		X

Menu Level 1	Menu Level 2	Tabs	Password		
			Basic	Inter-mediate	Advance
	Show password		X	X	X
	About				
Diagnosis	Warnings	Warnings		X	X
	Service screen	Signals			
		Locating Graph			
		Debug Settings			
		Test Board			
	Reset	Settings		X	X
		Factory Default			
		Calibration			

9 Operating the Instrument

9.1 Preparation

NOTICE

Do not expose the probe to a hydrogen concentration as large as 5% when the instrument is not powered, as this could damage or destroy the probe sensor.

NOTICE

When the instrument is put into operation the sensor withstands temporary exposure to hydrogen concentrations up to 100%.

Avoid long exposures to high concentrations.

During normal use, the blue LED light of the instrument should be steady.

► If the LED light is flashing go to Chapter "Troubleshooting".

► Ensure that the environment where the leak detection takes place is not contaminated or close to other hydrogen sources.

9.1.1 Conditions for Leak Detection

To use the instrument, the test object must be filled and pressurized with tracer gas (95% N_2 - 5% H_2) to achieve a gas flow through the leak.

Appropriate gas filling equipment can be obtained from your local supplier.

Exercise care in the handling of tracer gas after use. Released tracer gas contaminates the surrounding air with hydrogen and can affect subsequent measurements for some time. Ensure that the tracer gas is ventilated away from the target area, preferably to the outside of the building.

9.2 Battery Operation

The Sensistor Sentrac Portable Model is designed for mobile operation.

The battery charger will not restart automatically when the battery runs low if you leave battery charger connected.

For stationary operation you must do the following:

1. When battery is low, connect the battery charger.

2. Disconnect the battery charger when the battery is fully charged.

3. Reconnect the battery charger to initiate a new charging cycle.

9.3 Settings

9.3.1 How to Locate Leaks

In Locating Mode, the signal is displayed in the form of a bar. The length of the bar varies with the gas concentration.

This mode gives an audio and visual signal which increases as a leak is approached (a higher gas concentration) and decreases as the probe is moved away from the leak.

NOTICE

The operation in Locating Mode is not quantitative, therefore, there is no actual calibration to be done, but rather a setting of the sensitivity.

If Locating Mode is used and the alarm function is required to be activated at a particular calibrated level, the unit must be calibrated according to the instructions below.
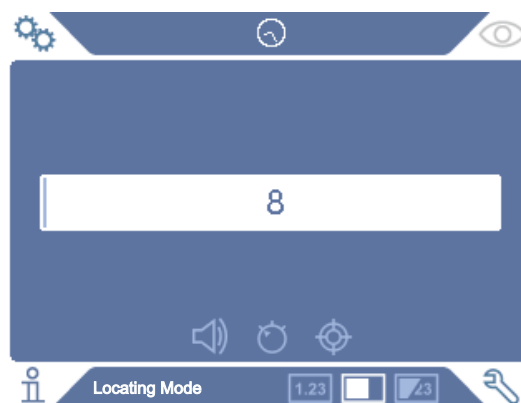
1. Click the **Locating Mode icon** on the Operation Screen.

2. Set up a calibration leak which corresponds to the smallest leak you want to detect. For more information see Calibration [▶ 37].

3. Put the probe close to the calibration leak and note the approximate reaction you get (no reaction, small, medium, high, full scale) within the first few seconds.

4. Click the **Sensitivity icon** on the Operation Screen and set the Sensitivity.

9.3.2 How to Detect Leaks

1. Move the probe tip close to and along the pressurized test object. A small leak can be more precisely located by moving the probe over the leak again.

2. Remove the probe promptly when a tone sounds. That indicates the detection/ location of a leak.

NOTICE

It is good practice to detect a leak, locate it, and then immediately remove the probe to avoid saturation. The probe is not damaged by long time exposure, but it will recover more slowly. After excessive exposure, the probe will be less sensitive for a short period of time.

Red fixed light together with Reject on the display means the instrument has detected a leak larger than the set reject level limit.

Large leaks may trigger the probe to react directly when approaching the test object. If the signal goes off the scale, simply reduce the sensitivity setting to bring the signal back onto the scale. Using the sensitivity setting in this way, you will be able to locate multiple leaks that are in close proximity to each other.

9.3.3 How to Measure Leaks

In Measuring Mode, the measured value is displayed in figures.

1. Calibrate the probe.
   See Calibration [▶ 37].

2. Click the measuring Mode icon on the Operation Screen.

Default unit in Measuring Mode is cc/s. To set it to other units click **Settings > Measuring Mode**.

The period during which the measured value is displayed can be adjusted in the Measuring Mode Settings menu. Click **Settings > Measuring Mode**.

The Hydrogen Leak Detector operates in the range 0.5 - 1000 ppm H_2. To obtain greatest accuracy over this range, follow the calibration recommendation. See Calibration [▷ 37].

9.3.4 Measuring Leaks

1. Move the probe around and over the product, to locate the exact spot where the leak might be (signal will increase as probe approaches the leak).

2. Move the probe around 200 mm (8 in.) from the measurement point.

3. Make sure the instrument indicates 0. If not, wait until it does.

4. Move the probe as close as possible to the leak.

5. Hold it there until the measured value stabilizes. This takes approximately 2-4 s.

6. Remove the probe from the measuring point when the measured value stabilizes and remains on the display and read the measured value.

7. Continue to the next measuring point and repeat the procedure.

NOTICE

The instrument is not an absolute gage, it measures relative to the background.

Therefore, the probe must first be some distance from the leak and then moved towards the leak for accurate measurement.

9.4 Hands On

It is important to have a correct calibration when measuring the size of a leak in Measuring Mode and Combined Mode. Calibrate the probe before measuring, see Calibration [▷ 37].

Ensure that the test object is pressurized properly before performing a test.

Parameters such as leak sizes, leak units and sensitivity can easily be set in the instrument.

1. Turn the instrument on. The instrument starts up and the blue LED light, on the right of the display, should be flashing slowly during warm-up phase. When the instrument is ready to use the blue LED shines with a fixed, steady light.

2.   Move the Hand Probe close to and along the pressurized test object. Move the probe on the possible places where there may be leaks.

3.   When a leak is found and the highest signal is found, move the probe away from the leak and back again for verification.

9.5 To Quantify Leaks

The Measuring Mode is used for measuring the size of a leak (or the concentration of a gas sample). To be able to do this measurement and obtain correct values, the instrument must first be calibrated using the calibration function.

In the Measuring Mode, the instrument determines the gas concentration from the change, as the probe goes from being exposed to background to being exposed to a certain gas concentration. The instrument does not continuously monitor the gas concentration but takes just one reading. Another suitable alternative name for this mode could be Sampling Mode. It is important to keep this in mind when using the instrument in this mode.

In Measuring Mode the probe should be moved directly from a background situation to the test point. The size of the leak in ppm, or any other selected units, is shown on the display. The probe can and should be removed from the measuring point as the measured value stabilizes and remains on the display. The period during which the measured value is displayed can be adjusted in the Settings menu.

The instrument operates in the range 0.5 - 1000 ppm H_2. To obtain greatest accuracy, follow the calibration recommendation. See Calibration [▶ 37].

9.6 I•Guide

The I•Guide sums several measuring results. A fixed or moving number of measurements with a maximum 25 measurement points can be chosen. The instrument must be in Measuring Mode or Combined Mode for this function to be active. Toggle the Mode function for Hand Probe.

To use I•Guide

If a fixed number of measurement points is used, then measure according to the following steps:

1. Press the probe button, or start button on the screen, to begin the first measurement.

2. Place the probe on the test object while the time bar moves. The instrument registers the results.

3. You might need to wait until the next measurement. The instrument signals Wait.

4. Repeat the procedure for the next measuring point.

When all measurements are made, the sum of all leaks is shown. If the sum of all leaks is greater or the same as the Reject Level, REJECT is shown. If the sum of all leaks is under the Reject Level, ACCEPT is shown. And if the sum of all leaks is greater than Reject Level before all measurements are made then REJECT is shown.

To begin a new measurement action or to stop a current measurement, press the probe button and hold the button for a moment.

It is possible to measure or search in Combined Mode for a leak without registering the measurement. A measurement value is only registered when the time bar is moving.

Measuring with Dynamic Measurement Points

If a dynamic number of measurement points is selected, then do the measurement in the following steps:

1. Press the probe button, or start button on the screen, to begin the first measurement.

2. Place the probe near the measurement point while the time bar is moving.

3. You might need to wait until the next measurement. The instrument signals Wait.

4. Repeat the procedure for the next measuring point.

5. When you sum up all the measurements press and hold on the probe button a short time.

To view specific measurements, press the **backward** and **forward** buttons simultaneously.

If a measurement is to be aborted and restarted, press and hold the probe button a few seconds. You can also click the Abort button on the screen.

10 Recipes

A recipe is a collection of settings suited for a particular test setup. This is used for having different settings for different test objects.

Calibration settings are not saved in the recipe.

A calibration leak or calibration gas is normally used to calibrate the instrument.

10.1 Recipe Overview

▶ Click Settings **>** Recipe to enter the Recipe Setup menu.
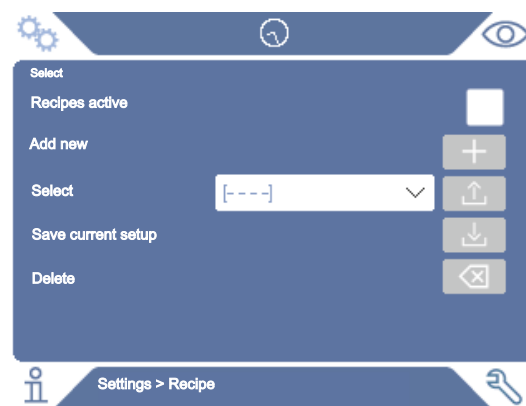
10.2 Create a Recipe

10.2.1 New Recipe

Set up the instrument with the parameters that are to be saved in the recipe.

1. Click Settings > Recipe to enter the Recipe Setup menu.

2. Check the Recipes active check-box to activate the use of recipes.

3. Add a new recipe by clicking the plus icon aligned with Add new.

4. Type in the name wanted for the recipe.

5. Choose the new recipe in the drop down list and click the Recipes Active checkbox to activate your recipe. The recipe name will appear in the upper part of the display.

10.2.2 Modify a Recipe

1. Activate the recipe you want to modify.

2. Modify the settings for your recipe.

3. Click Settings > Recipe to enter the Recipe Setup menu.

4. Modify your recipe.

5. Click Save actual setup to save your recipe.

10.2.3 Select an Existing Recipe

1. Click Settings > Recipe to enter the Recipe Setup menu.

2. Check the Recipes active check-box to activate the use of recipes.

3. Select a recipe in the Select pull down menu.

4. Click the download/select icon to load the recipe.

10.2.4 Delete a Recipe

1. Click Settings > Recipe to enter the Recipe Setup menu.

2. Select a recipe in the pull down menu.

3. Click the delete icon.

11 Calibration

11.1 About Calibration

There are two ways of calibrating the probe:

- Calibration gas: Available at gas suppliers and has a known concentration of hydrogen (10 ppm hydrogen in synthetic air is recommended).

- Calibration leak: Available at INFICON and has a fixed leak rate (mbar l/s or g/y).

Both methods take less than 2 minutes to perform.

If calibration fails you can still use the instrument. Last valid calibration parameters will be used. You should, however, check that the instrument reacts to the reference.

11.1.1 When Needed?

It is important to have a correct calibration when measuring the amount of a leak. Calibration may then be necessary when the instrument is set in these modes:

- Measuring Mode, or

- Combined Mode used to measure leaks.

Set Calibration Interval

Automatic calibration reminder can be set in this way:

1. Click Settings > Calibration > Interval.

2. Set interval.
   Spans between 1 second to a maximum of 255 days. Set the interval to "Off" to turn the automatic calibration reminder off.

The unit will then signal the interval through a pulsating sound indication together with the text "Calibrate!"

The sensitivity changes slowly with time. Therefore we recommend regularly calibration to keep the highest measuring accuracy. How often you need to calibrate depend on measuring situation and leak rate size. Contact INFICON to get help to this assessment.

11.1.2 Required Equipment

- Calibration Gas or Calibration Leak

- Tracer gas (to feed the leak)

• Relevant Certificate

For more information see Spare Parts and Accessories [▶ 69].

11.2 How to Calibrate

INFICON support two types of Calibration Leak. The one with large leaks must be connected to tracer gas pressure to work. The small leak is connected to a small fillable gas container. Read the instruction delivered with the leak how to set up and how to use the leak.

11.2.1 Prepare the Calibration Leak

Leak with container:

1. Fill the gas container to the indicated pressure with tracer gas.

2. Leak is ready to use.

Leak without container:

1. Connect the leak with tracer gas with the pressure according the certificate.

2. Vent the hose from air via the Purge Valve on the leak.

3. Start to use the leak.

11.2.2 Set the Calibration Value
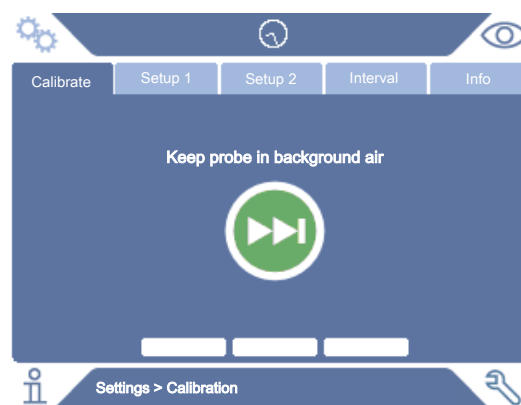
1. Click Settings > Calibration > Setup 1.

2. Set the Calibration Unit and Calibration Value (as stated on the calibration certificate issued for the leak).

3. If using Calibration Leak: Click Settings > Calibration > Setup 2 to set calibration Leak Gas type.

4. Set Leak Gas (as stated on the calibration certificate issued for the leak)

Example, Calibration Leak:

Calibration Leak Rate is 4.2E-05 mbar l/s (95% N_2 - 5% H_2).

Calibration Unit = mbar l/s

Calibration Value = 4.2E-05

Calibration Leak Gas = 95% N_2 - 5% H_2

Example, Calibration Gas:

Calibration Gas containing 10 ppm Hydrogen in synthetic air.

Calibration Unit = ppm

Calibration Value = 10

NOTICE

If another pressure is used than that on the certificate, correlate the resulting flow and use this value as Calibration Value. During the calibration procedure, the concentration of the calibration leak should always be within the range of:

5 ppm - 400 ppm H_2

$1x10^{-5}$ to $4x10^{-3}$ cc/s (mbarl/s) defined for air

3 to 120 g/a defined for R134a

Use the same value or higher (maximum 10 times higher) than the Reject Level.

If uncertain of the optimal calibration leak for your application, please contact your local provider of the instrument.

Click Interval to activate and set the Calibration Interval Reminder. Click Info for information about the last successful calibration time.

11.2.3 Calibration Procedure

1. Click the Calibration icon on the Operation Screen, or click Settings > Calibration > Calibrate.

2. Keep the probe in the background air.

3. Click the Next button to start the calibration procedure.

4. Click the Start button or the Probe button.

5. Expose the Probe to the Calibration Leak or the Calibration Gas. Keep it in exposed position while the Calibration in progress bar is moving.

6. Remove the Probe when the display shows Remove probe and gives a sound signal.

7. Continue the calibration routine until you can save the calibration.

NOTICE

Wait at least 30 seconds between each calibration.

If the calibration is not saved, the instrument will revert to the previous value.

When changing setup or probe you will need to repeat the exposure 2-3 times to get Calibration OK.

When performing a calibration the instrument will indicate if the probe sensor has lost its sensitivity and needs to be changed. For information about changing the probe sensor, see Changing Probe Sensor [▶ 57].

---

12 Info

12.1 Statistics

12.1.1 Run Time

► To see the current operation time, click Info > Statistics > Run Time.

Two runtime counters can be reset and used for specific needs. The two timers are also reset when a reset is performed on the instrument.

12.1.2 Calibration

To see information regarding:

- number of calibrations in total
- number of failed calibrations
- date and time of latest calibration
- etc.

► Click Info > Statistics > Calibration.

12.1.3 I•Guide

To see statistics about:

- number of tested objects
- number of accepted tests
- number of rejected tests

► Click Info > Statistics > I•Guide.

12.2 Export/Import

12.2.1 Export

Backup of all useful settings, including recipes, can be exported to an SD-card.

1. Insert an SD-card in the SD-card holder
2. Click Info > Export/Import > Export
3. In Settings, click on the backup to SD-button

A text file is created on the SD-card.

The settings can be imported to any Sentrac instrument.

12.2.2 Import

All useful settings, including recipes, can be imported from an SD-card.

1. Insert the SD-card with the backup into the SD-card holder

2. Click Info > Export/Import > Import

3. In Settings, click on the backup from SD-button

The previously exported settings, including any recipe, is imported to the instrument.

12.3 Settings Overview

► To show all settings, click Info > Settings overview.

If recipe is used, only active settings are shown.

12.4 I/O

► If recipe is used, only active settings are shown.

The Analog Out level is also shown. The displayed digits show the voltage.

12.5 Show Password

► To show the set password(s), click Info > Password.

12.6 About

► To shown the serial number and software version of the instrument and probe, click Info > About.

13 Diagnosis

13.1 Warning

► To see a list of all occurred warnings, click Diagnosis > Warnings.

This list can only be reset by authorized service personnel.

13.2 Service Screen

This screen is used for servicing and repair.

Available only to authorized service personnel.

13.3 Reset

► To reset the instrument to default settings, click Diagnosis > Reset.

The Factory Default and Calibration tabs are available only to authorized service personnel.

14 Serial Communication

USB/RS232

Types of USB/RS232 commands

• Read Parameter	Read parameters who have impact of the measurement
• Write Parameter	Write parameters who have impact of the measurement
• Read Device Setup	Read data about the instrument and device
• Write Device Setup	Write data about the instrument and device
• Command Execute	Function command
• Read File	Read file on SD-card
• Command File	Function command to manage file on SD-card

Command Structure

Syntax	Sequence of Data
Read Parameter + [nn] + \n	rPnn\n
Write Parameter + [nn] + [space] + [value/text] + \n	wPnn [value/text]\n
Read Device Setup + [cc] + \n	rDcc\n
Write Device Setup + [cc] + [space] + [value/text] + \n	wDcc [value/text]\n
Command Execute + [cc] + [space] + [value/text] + \n	cEcc [value/text] \n
Read File + [sd] + [space] + [File name.LOG] + \n	rFsd [File name.LOG]\n
Command File + [dl] + [space] + [File name.LOG] + \n	cFdl [File name.LOG]\n

nn = number of parameter

cc = info (2 characters)

\n = cursor return (do not write "\n" when using the terminal of the installer)

Some *Write* commands require a restart of Sentrac to start working.

RS232 set up

Baud rate:	115200 (Default)
Data:	8
Priority:	None
Stop bit:	1

Read and Write Parameters

Parameter	Read		Write	
	Sequence of Data	Answer	Sequence of Data	value/text
LANGUAGE	rP01\n	Language: [text]	wP01 [value]\n	0 = EN 1 = DE 2 = FE 3 = IT 4 = ES 5 = CH 6 = JP
OPERATION_MODE	rP02\n	Operation Mode: [text]	wP02 [value]\n	0 = Measuring Mode 1 = Locating Mode 2 = Combined Mode
CALIBRATION_UNIT	rP03\n	Calibration Unit: [text]	wP03 [text]\n	If write cc/s, Pa m^3/s, cc/in, SCCM, g/yr, oz/yr, mbarl/s, mm^3/s, mm^3/min automatic converting is enabled. Max 14 characters.
CALIBRATION_VALUE	rP04\n	Calibration Value: [value]	wP04 [value]\n	
CALIBRATION_SAMPLING_TIME	rP05\n	Calibration Sampling Time (s): [value]	wP05 [value]\n	3 - 60
LEAK_GAS	rP06\n	Leak Gas: [text]	wP06 [text]\n	If write 95%N$_2$ - 5%H$_2$, Air, He, N$_2$, H$_2$, R123a, R22, R290, R404a, R407c, R410, R600a, R1234yf automatic converting is enabled. Max 14 characters.

Parameter	Read		Write	
	Sequence of Data	Answer	Sequence of Data	value/text
LEAK_GAS_VISCOSITY	rP07\n	Leak Gas Viscosity (µPas): [value]	wP07 [value]\n	Enable when Leak gas not set to: 95%N_2/5%H_2, Air, He, N_2, H_2, R123a, R22, R290, R404a, R407c, R410, R600a, R1234yf
LEAK_GAS_DENSITY	rP08\n	Leak Gas Density (g/l): [value]	wP08 [value]\n	Enable when Leak gas not set to: 95%N_2 - /5%H_2, Air, He, N_2, H_2, R123a, R22, R290, R404a, R407c, R410, R600a, R1234yf
CAL_INTERVAL_ACTIVE	rP09\n	Interval Reminder active: [text]	wP09 [text]\n	0 = On 1 = Off
CAL_INTERVAL_DAYS	rP10\n	Days: [value]	wP10 [value]\n	0 - 255
CAL_INTERVAL_HOURS	rP11\n	Hours: [value]	wP11 [value]\n	0 - 23
CAL_INTERVAL_MINUTES	rP12\n	Minutes: [value]	wP12 [value]\n	0 - 59
LOC_SENSITIVITY	rP13\n	Sensitivity: [value]	wP13 [value]\n	1 - 15
LOC_RANGE_CHOICE	rP14\n	Locating Range: [text]	wP14 [text]\n	0 = Manual 1 = Auto
LOC_REJECT_INDICATION	rP15\n	Reject Indication: [text]	wP15 [text]\n	0 = On 1 = Off
LOC_READY_PULSE	rP16\n	Locating Audio Ready Pulse: [text]	wP16 [text]\n	0 = On 1 = Off
LOC_DIRECT_ADJUST	rP17\n	Direct Sensitivity Adjustment: [text]	wP17 [text]\n	0 = On 1 = Off
LOC_AUDIO_THRESHOLD	rP18\n	Locating Audio Threshold (%): [value]	wP18 [value]\n	0 - 100
MEASURE_UNIT	rP19\n	Measuring Unit: [text]	wP19 [text]\n	If write cc/s, Pa m^3/s, cc/in, SCCM, g/yr, oz/yr, mbarl/s, mm^3/s, mm^3/min automatic converting is enabled. Max 14 characters.
CORR_VALUE	rP20\n	Correlation Value: [value]	wP20 [value]\n	

Parameter	Read		Write	
	Sequence of Data	Answer	Sequence of Data	value/text
MEAS_GAS	rP21\n	Displayed Gas: [text]	wP21 [text]\n	If write 95%N_2 - 5%H_2, Air, He, N_2, H_2, R123a, R22, R290, R404a, R407c, R410, R600a, R1234yf automatic converting is enabled. Max 14 characters.
MEAS_GAS_VISCOSITY	rP22\n	Displayed Gas Viscosity (µPas): [value]	wP22 [value]\n	Enable when Displayed Gas not set to: 95%N_2 - 5%H_2, Air, He, N_2, H_2, R123a, R22, R290, R404a, R407c, R410, R600a, R1234yf
MEAS_GAS_DENSITY	rP23\n	Displayed Gas Density (g/l): [value]	wP23 [value]\n	Enable when Displayed Gas not set to: 95%N_2 - 5%H_2, Air, He, N_2, H_2, R123a, R22, R290, R404a, R407c, R410, R600a, R1234yf
MEAS_GAS_SHOW	rP24\n	Displayed Gas Name: [text]	wP24 [text]\n	0 = On 1 = Off
REJECT_LEVEL	rP25\n	Reject Level: [value]	wP25 [value]\n	
REJ_CHOPPED_AUDIO	rP26\n	Chopped Audio Signal: [text]	wP26 [text]\n	0 = On 1 = Off
REJ_PROBE_FLASH	rP27\n	Probe Lamp Flash: [text]	wP27 [text]\n	0 = On 1 = Off
SHOW_REJECT_LEVEL	rP28\n	Show Reject Level: [text]	wP28 [text]\n	0 = On 1 = Off
MIN_PRESENT_TIME	rP29\n	Min Presentation Time (s): [value]	wP29 [value]\n	0.1 – 100 (1=0.1 s)
DISPLAY_THRESHOLD	rP30\n	Display Threshold (%): [value]	wP30 [value]\n	0 – 99
MEAS_AUDIO_THRESHOLD	rP31\n	Measuring Audio Threshold (%): [value]	wP31 [value]\n	0 – 99
MEAS_READY_PULSE	rP32\n	Measuring Audio Ready Pulse: [text]	wP32 [text]\n	0 = On 1 = Off

Parameter	Read		Write	
	Sequence of Data	Answer	Sequence of Data	value/text
MEAS_DIGITS	rP33\n	3 digits in measure value: [text]	wP33 [text]\n	0 = On 1 = Off
MULTIPOINT	rP34\n	I·Guide Mode: [text]	wP34 [text]\n	0 = Off 1 = Fixed 2 = Dynamic
MULTIPOINT_TIME	rP35\n	I·Guide Measuring Time (s): [value]	wP35 [value]\n	0.5 – 200 (1 = 0.1 s)
POINTS	rP36\n	I·Guide Positions: [value]	wP36 [value]\n	1 – 100
MULTIPOINT_SUM	rP37\n	I·Guide Sum: [text]	wP37 [value]\n	0 = Off 1 = On
MULTIPOINT_BLOCK	rP38\n	I·Guide High Signal Wait: [text]	wP38 [value]\n	0 = Off 1 = On
PROBE_BUTTON_FUNC	rP39\n	Probe Button Function: [text]	wP39 [text]\n	0 = No function 1 = Toggle Mode 2 = Zero Loc. Sig 3 = Probe Lamp 4 = Print 5= Sensitivity
PROBE_LAMP	rP40\n	Probe Lamp: [text]	wP40 [text]\n	0 = Off 1 = On
RECIPES_ACTIVE	rP41\n	Recipes active: [text]	wP41 [text]\n	0 = On 1 = Off
SCREEN_BRIGHTNESS	rP42\n	Brightness: [value]	wP42 [value]\n	1 - 17

Parameter	Read		Write	
	Sequence of Data	Answer	Sequence of Data	value/text
SCREEN_TIMEOUT	rP43\n	Screen saver: [text]	wP43 [text]\n	0 = Off
				1 = 5 s
				2 = 30 s
				3 = 1 min
				4 = 2 min
				5 = 5 min
				6 = 10 min
				7 = 20 min
				8 = 30 min
				9 = 1 h
				10 = 2 h
AUDIO_BASE_FREQ	rP44\n	Base frequency (Hz): [value]	wP44 [value]\n	0 = 0
				1 = 300
				2 = 400
				3 = 500
				4 = 600
				5 = 700
SPEAKER_MUTE_HEADPHONE	rP45\n	Mute speaker if headphone: [text]	wP45 [text]\n	0 = Mute
				1 = No mute
SPEAKER_MUTE_SCREENSAVER	rP46\n	Mute speaker in screen save mode: [text]	wP46 [text]\n	0 = On
				1 = Off
Read All Parameters	rPAL\n	[List of all parameters rP1 to rP44]	-	-

Read and Write Device Setup

Setup	Read		Write		Explanation
	Sequence of Data	Answer	Sequence of Data	value/text	
Read/write instrument serial	rDis\n	[S/N]	wDis [text]\n	S/N	Max 8 characters
Read instrument S/W version	rDiv\n	[SW ver. No.]	-	-	X.XX.XX
Read/write device serial	rDds\n	[S/N]	wDds [text]\n	S/N	Device e.g P60. Max 8 characters
Read/write device type	rDdt\n	[Device type], e.g P60	wDdt [value]\n	0 - 9	0 = UNKOWN 1 = P60 2 = PL60 3 = COMBOX60 4 = TGF11 5 = AP29_SENTRAC 6 = P50 7 = AP29 8 = COMBOX 9 = STRIX
Read device S/W version	rDdv\n	[SW ver. No.]	-	-	X.XX.XX
Read device S/W bootloader version	rDdb\n	[SW B ver. No.]	-	-	X.XX.XX
Measure [Value read request]	rDmv\n	[Same digit as on the screen]	-	-	
Set Main Run Time	-	-	wD\r [value]\n	In minutes.	In terminal, write "wD\\r 60\n" for 1 hour.
Read/write real time clock	rDcl\n	[yyyy-MM-dd HH:mm:ss]	wDcl [text]\n	yyyy-MM-dd HH:mm:ss	

Execute Commands

Execute command	Sequence of Data	Value/text	Explanation
Bitmap Dump	cEBD\n	-	Save a bitmap of Sentrac screen on SD-card inserted into Sensistor Sentrac. File name: [time].bmp
Operation Mode change	cEom [value]\n	1 … 3	1 = Localization 2 = Measuring 3 = Combined
Set analog out	cEao [value]\n	0 … 255	0.15 - 10.0 V, with a resolution of 8 bits between set values of Measuring Mode
Load recipe	cElr [value]\n	1...8	
Factory reset	cEfd\n	-	
Settings reset	cEsr\n	-	
Set Last service		-	Date set by Sensistor Sentrac's real time clock
Wake up screen	cEwu\n	-	

Read File (Data)

File data	Read		
	Sequence of Data	Answer	Explanation
Read Data	rFsd SENTRAC.LOG\n	SENTRAC.LOG+[File content] ("SENTRAC:LOG No data saved/File I/O err" if no saved data) ("SD-card not inserted" if no SD-card)	Read the content of saved measuring data on SD-card and send it as a text file.

Command File

Command File	Sequence of Data	Answer	Explanation
Delete file	cFdl SENTRAC.LOG\n	File deleted ("No data to delete/Data delete error" if no saved data) ("SD-card not inserted" if no SD-card)	Delete saved measuring data on SD-card and send it as a text file.

15 Troubleshooting

15.1 Faulty Symptoms

Fault Symptom	Fault	Measures
No sound in Detection Mode and Analysis Mode.	Sound set low.	Click the speaker icon to increase the volume
	Broken speaker or speaker cable loose.	Send in for repair.
No picture on the display, no sound.	Fuse broken.	Check fuse. Replace if broken.
	Main Cable broken.	Replace the Main Cable.
	Discharged battery (Portable Model).	Charge the battery.
	Main PCB broken.	Send in for repair.
No picture on display	Display broken or lamp cable loose.	Send in for repair.
White picture on display.	Main PCB broken or display cable loose.	Send in for repair.
No working display touch function	Display broken or touch cable loose.	Send in for repair.
Loss of spots or black lines on screen.	Display broken.	Send in for repair.
Bad sound out of the speaker.	Broken speaker.	Send in for repair.
Short operation time on Portable Model.	Old or broken battery.	Send in for repair.
The time and dates resets at restart.	The clock battery is empty.	Send in for repair.
Settings lost on restart	Main PCB Memories broken (Flash Memories).	Send in for repair.
Low or no gas sensitivity.	Old or broken gas sensor. Probe broken.	Replace sensor.
No prob lamp light	Broken lamp. Broken probe PCB.	Send in for repair. Send in for repair.
No display light or partly picture	No display light or partly picture.	Send in for repair.

15.2 Warning Messages

Message	Indicators	Message in the menu warning list	Code
Probe not connected.	Blue LED flashing.	(None)	(None)
SD-card not inserted.	Orange measure window at screen.	(None)	(None)
Battery discharged. Recharge battery.	Orange measure window at screen, fast Blue LED flashing.	(None)	(None)
Sensor broken or not connected. Change sensor or connect sensor. (Voltage to high, Error E1)	Red measure window at screen, Blue LED flashing.	Sensor broken or not connected. (Voltage to high)	01
Sensor broken. Change sensor. (Voltage to Low, Error E2)	Red measure window at screen, Blue LED flashing.	Sensor broken. (Voltage to Low)	02
Sensor broken. Change sensor. (Temperature to Low, Error E3)	Red measure window at screen, Blue LED flashing.	Sensor broken. (Temperature error)	03
Probe disconnected. Reconnect the probe. (Error 04)	Red measure window at screen, Blue LED flashing.	Probe disconnected.	04
Low sensor signal.		Reject level to low for sensor sensitivity.	09

16 Maintenance Instructions

> ⚠ **DANGER**
>
> **Electrical shock**
>
> Always switch off the instrument before performing maintenance.

> ⚠ **DANGER**
>
> **Electrical shock**
>
> Do not open the instrument needlessly! Service of this equipment may only be carried out by service organizations authorized for this purpose by INFICON. Changing the battery is the only time when opening the instrument is needed and allowed.

16.1 Changing Fuses

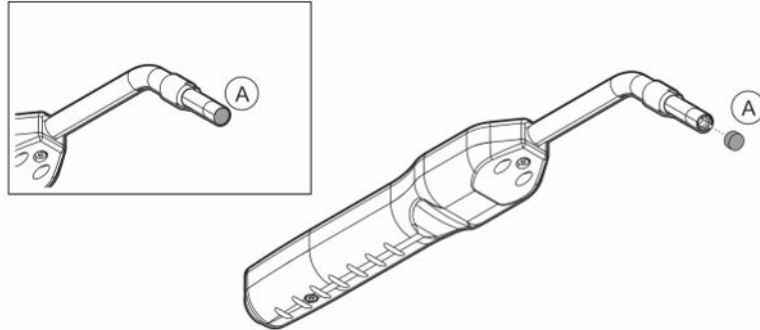| Part	Part no.	Qty. Consumables
Fuse, 2A T slow	591-578	2
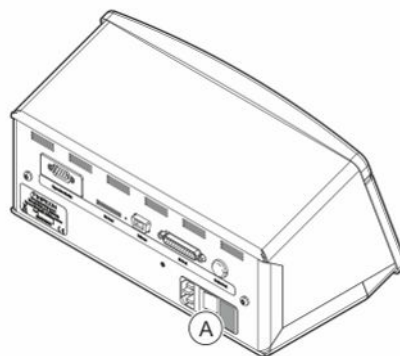
Disassemble

1. Remove the lid (A) containing the fuses.

2. Remove the fuses.

Assemble

1. Install new fuses.

2. Reinstall the lid (A) containing the fuses.

16.2 Changing Probe Tip Filter

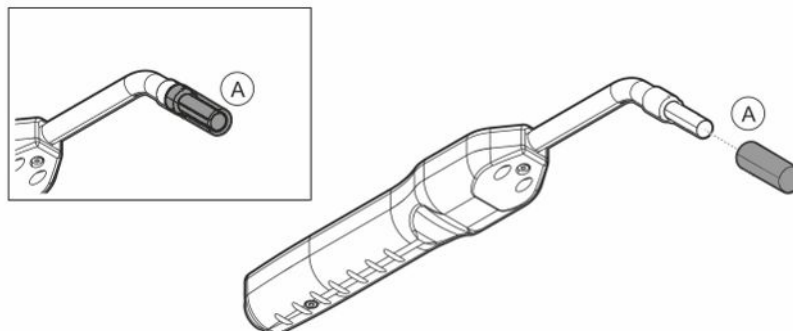| Part	Part no.	Qty. Consumables
Probe Tip Filter	591-234	1

Disassemble

► Remove the Probe Filter (A) using a needle.

Assemble

► Install the new Probe Filter.

16.3 Changing Probe Protection Cap

Part	Part no.	Qty Consumable
Probe Tip Protection Cap	591-273 (set of 50)	1
	590-625 (set of 500)	1

Disassemble

1. Attach the supplied Sensor Key at the bottom of the Probe Tip Protection Cap (A) and pull with one finger on each side of the probe tip.

2. Remove the Protection Cap (A).

Assemble

1. Install the new Probe Tip Protection Cap by pressing it over the tip until you hear a clicking sound.


If the probe tip filter is removed, an air gap is formed between the inner metal filter and filter in the protection cap.

The filter in the protection cap prevents water to get into the probe if the probe comes in contact with water.

It is recommended to always replace the protection cap with a new if exposed to water.

16.4 Changing Probe Sensor

Part	Part no.	Qty. Consumables
Hydrogen Sensor	590-292	1
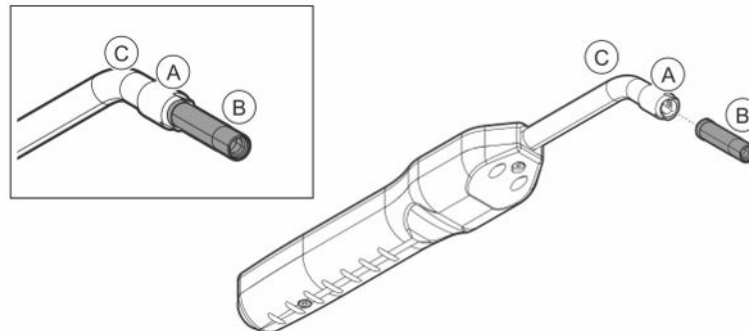
Disassemble

1. Loosen the safety nut (A) using the Sensor Key.

2. Remove the Sensor (B) by pulling it straight out.

Assemble

1. Carefully install the new Sensor. Make sure that the Probe Pipe (C) and Sensor connects correctly.

2. Reinstall the safety nut (A).

# 16.5 Changing the Battery (Portable Model)

> ⚠ **DANGER**
>
> **Electrical shock**
>
> Always switch off the instrument before performing maintenance.

> ⚠ **DANGER**
>
> **Electrical shock**
>
> Do not open the instrument needlessly! Service of this equipment may only be carried out by service organizations authorized for this purpose by INFICON. Changing the battery is the only time when opening the instrument is needed and allowed.

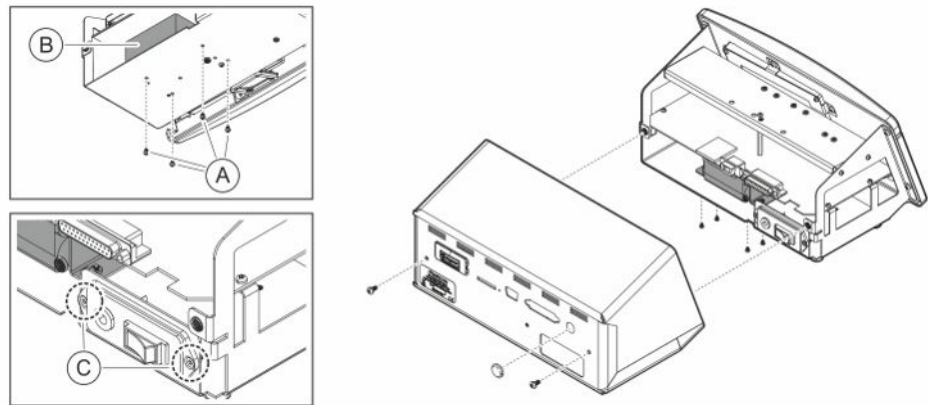| Part	Part no.	Qty	Consumables
Instrument casing	598-194	1	
Battery Li-Ion 14,8 V	591-782	1	
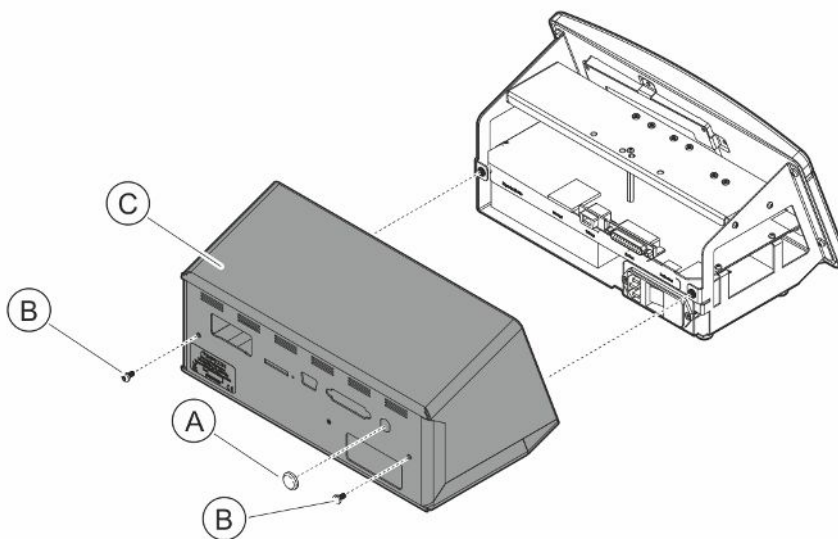
To change the battery remove the cover first:

Removing the Cover

1. Disconnect the mains connector.

2. Use a Spanner for notched nut to remove the Probe Connection Port nut (A).

3. Remove the two screws (B) holding the cover (C).

4. Remove the cover (C).

Changing the Battery

1. Remove the two screws (C) holding the power switch panel.

2. Remove the four screws (A) holding the Battery (B).

3. Remove the Battery (B).

4. Remove the Battery cabling from the power switch panel and main PCB.

5. Install the new Battery.

6. Mount the Battery cabling according to drawing below.

7. Reinstall and tighten the four screws (A) holding the Battery.

Insert RED batterycable and CBL3 into J4
RED battery cable lenght = 150 mm
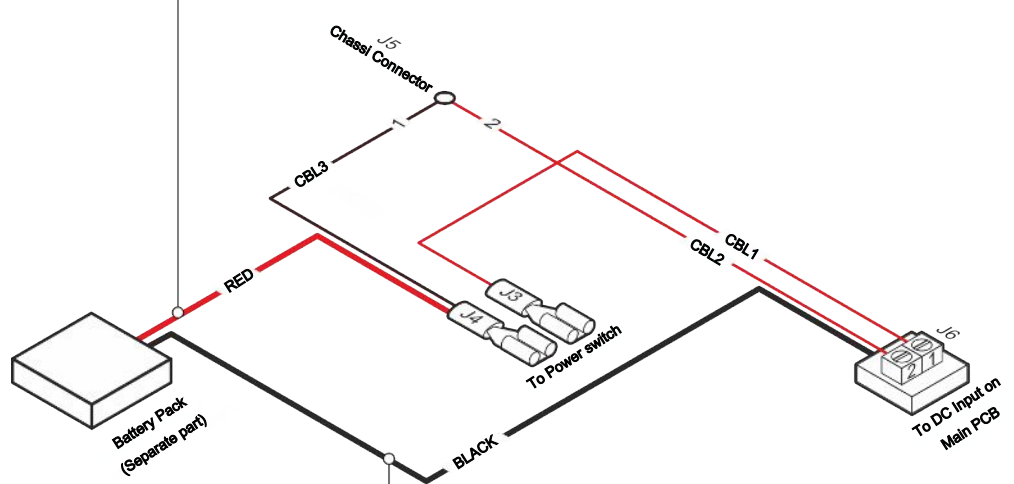
Insertsert BLACK battery cable into J6 pin 2
BLACK battery cable length = 300 mm

Assembling the Cover

1. Reinstall the cover (C). Make sure that the lock washer on the Probe Connection Port (LEMO connector on main PCB) is still present. Important for proper grounding. Make sure that no cables are pinched between the cover and the chassis.

2. Reinstall and tighten the two screws (B) holding the cover (C). Tighten to 4 Nm.

3. Reinstall the Probe Connection Port nut (A).

4. Use a Spanner for notched nut and tighten the Probe Connection Port nut.

5. Check the resistance between the ground pin in the mains socket and the outside of the probe cable connector, should be 9 Ω or lower. If not, check the lock washer on the Probe Connection Port.

16.6 Software Update

1 Download the update software to a computer.

2 Locate the downloaded file. Double click on Setup.exe.

⇨ If an older version of the software is already installed, it must be removed. Follow the given directions.

3 An icon will appear on the desktop when the installation is finished.

4 Connect the instrument to the computer.

⇨ Connect the probe to the instrument if the probe-software is to be updated.

5 Double click on the icon on the desktop.

⇨ Check for the code [Instrument Serial no.] in the COM port window. If the code is present, the communication between the computer and the instrument is set up.

6 Chose which unit to update, instrument or probe.

7 Click "download" to perform the software update.

8 Restart the instrument after completed update.

17 Service

> ⚠ **DANGER**
>
> **Electrical shock**
>
> Always switch off the instrument before performing maintenance.

> ⚠ **DANGER**
>
> **Electrical shock**
>
> Do not open the instrument needlessly! Service of this equipment may only be carried out by service organizations authorized for this purpose by INFICON. Changing the battery is the only time when opening the instrument is needed and allowed.

> ⚠ **CAUTION**
>
> If the instrument suffers external damage, it must be checked and repaired by a service organization authorized by INFICON.

In case of required service or repair, contact nearest INFICON service center. Please visit www.inficon.com for further information.

18 Technical Data
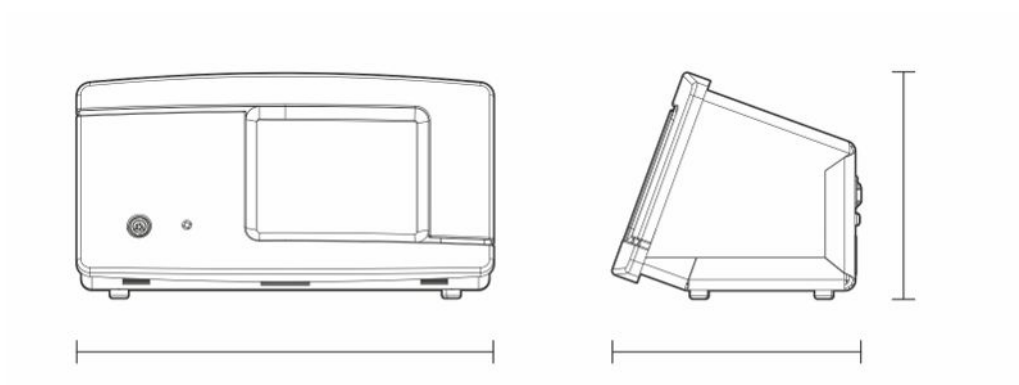
Electrical Data	
Power supply	100-240 V (ac), 50/60 Hz, 2 A
Internal rechargeable battery (Portable Model)	Li-Ion, 14.8 V / 65 Wh (4400 mAh)

Physical Data	
Lowest detectable leak rate	0.5 ppm H_2
Measurement range	5×10^{-7} mbarl/s or cc/s with 5% H_2
Sensor response time	At 10 ppm, the reaction time of the measured signal is about 0.5 seconds and response time about 2 seconds.
Time until ready for operation	1 min

Capacity	
Portable Model	Operating time: 12 – 20 h

Other Data	
Dimensions Desktop Model	165 x 305 x 182 mm ~ 6.5 x 12.0 x 7.2 in.
Dimensions Portable Model + Carrying Case	200 x 330 x 280 mm ~ 7.8 x 13 x 11 in.
Weight	Desktop model: 4.2 kg ~ 9.2 lbs Portable model: 4.8 kg ~ 10.5 lbs
Ambient temperature	10-45°C (50-113°F)
Ambient humidity	10-90% RH (non-condensing)
Protection (IEC529)	Desktop Model IP52 (front), IP30 (back) Portable Model IP52 (front), IP30 (back)

18.1 Interfaces and Connectors
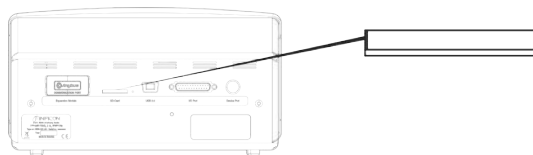
> ⚠ **CAUTION**
>
> **The outputs will be destroyed**
>
> Outputs are not relay types. Do not connect external drive source such as 24 VDC or 100/230 VAC.
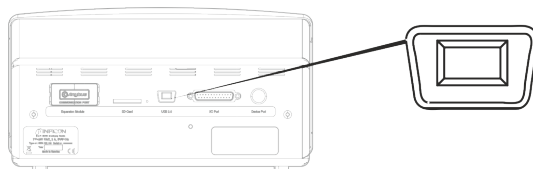
ⓘ All ports below are the same for both Portable and Desktop Model, except for where otherwise stated.

18.1.1 SD Card Slot

Connector:	SD card
Purpose:	For import and export of recipes and logged data

18.1.2 USB 2.0 Port

Connector:	USB cable
Purpose:	For connecting the instrument to a PC
Cable:	USB 2.0 type Mini-B plug (male) – USB standard type A (male)

18.1.3 I/O-Connector Port
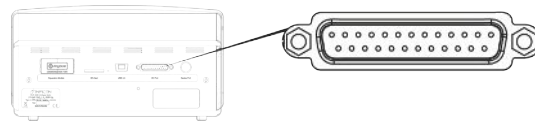
Connector:	25 pin female D-sub

Pin	Signal	Specification	Function
1	RS232: Shield	See note [1]	Serial communication
2	RS232: TxD (DTE transmit data)	See note [1]	Serial communication
3	RS232: RxD (DTE receive data)	See note [1]	Serial communication
4	RS232: RTS (Request to send, issued by DTE)	See note [1]	Serial communication
5	RS232: CTS (Clear to send, issued by DCE)	See note [1]	Serial communication
6	RS232: DCE ready	See note [1]	Serial communication
7	RS232: Signal GND	See note [1]	Serial communication
8	RS232: CD (Carrier detect, issued by DCE)	See note [1]	Serial communication
9	24 V	Max 2 A [2]	Power supply for I/O
10	GND		GND for I/O
11	Analog input 0-10 V	Nominal level = [+0.05 ... +9.95] V Maximum level = [-50 ... +50] V Input impedance = 22 kΩ Input LP-filter fc = 2.9 kHz A/D internal resolution: 10-bit	Not used
12	PLC input EXT0	See note [3]	Selectable input function, see note [6]
13	PLC input EXT2	See note [3]	Selectable input function, see note [6]
14	Audio line out return (GND)		GND External Speaker

| Pin	Signal	Specification	Function
15	Audio line out	AC-coupled Output is unbalanced Line_OUT- is connected to GND Line_OUT+ carries analog audio symmetrically to GND Output voltage swing, min = - 1.65 V Output voltage swing, max = +1.65 V Output impedance = 160 Ω @ 400 Hz 136 Ω @ 1 kHz 122 Ω @ 10 kHz Output LP filter fc = 133 kHz	Output External Speaker
16	PLC output EXT0	See note [4]	Selectable output function, see note [5]
17	PLC output EXT1	See note [4]	Selectable output function, see note [5]
18	PLC output EXT2	See note [4]	Selectable output function, see note [5]
19	PLC output EXT3	See note [4]	Selectable output function, see note [5]
20	RS232: DTE ready	See note [1]	Serial communication
21	GND		GND for I/O
22	RS232: Ring indicator	See note [1]	Serial communication
23	Analog output 0-10 V	Nominal range = [0.150 ... +10.0] V Resolution: 8-bit Output current = -65 mA (sourcing) / +100 mA (sinking) Unlimited capacitive load No short-circuit protection	Linear output between two measuring levels. Check value level, Calculate RL voltage, calculate resolution.
24	GND		GND for I/O
25	PLC input EXT1	See note [3]	Selectable input function, see note [6]

| Notes	1)	OUT Note on RS-232 communication:
		This system is a DCE device with only RXD, TXD and GND. Remaining RS-232 signals are not implemented. A DB9-to-DB25 adapter can be used: then connect the DB25 male to this system (DCE) and connect the DB9 female to the terminal device (DTE).
	2)	2 A = 24 V + total Digital outputs current. Not available for portable model
	3)	Nominal level = [0 ... +24] V
		Maximum level = [-50 ... +50] V
		Low-high threshold = appr. 8.5 V
		Input impedance = min 23 kΩ
		Input functions selectable in the menu: • Unused • Start (I•Guide) • Stop (I•Guide) • Locating Signal Zeroing • External Alert (Error high)
	4)	Nominal level = [0 ... +24] V. Not available for portable model
		Maximum sourcing current = 500 mA
		Output impedance = max 4 Ω
		Output functions selectable in the menu: • Unused • Reject • Accept (only I•Guide) • Calibrated • Not Ready • Gas Signal • Not Ready or Gas Signal • Error (summary error)
	5)	Outputs: • Unused • Reject • Accept • Calibrated • Not Ready

- Gas Signal

- Not Ready or Gas Signal

- Error (summary error)

[6)] Inputs:

- Unused

- Start (I•Guide)

- Stop (I•Guide)

- Locating Signal Zeroing

- External Alert
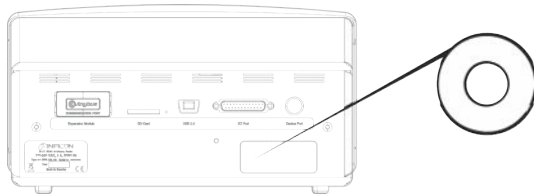
18.1.4 Probe Connector Port
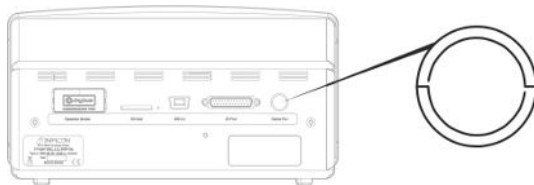
Cable:	C21 Probe Cable

18.1.5 Power Input (Desktop Model)
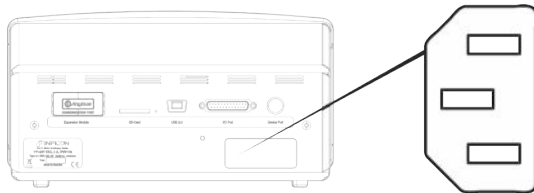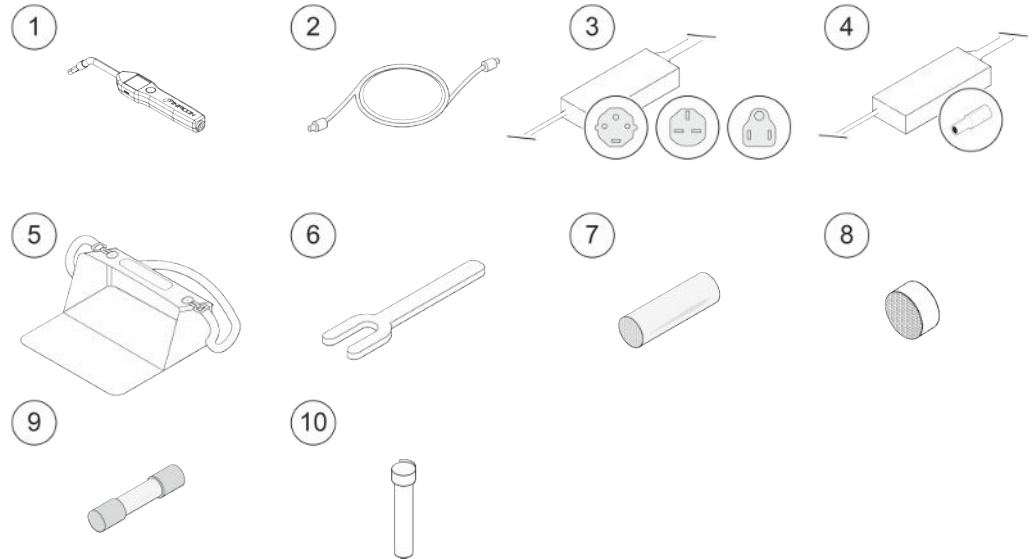

Cable:	Power Cable

18.1.6 Power Input (Portable Model)

Cable:	Battery Charger

19 Spare Parts and Accessories

19.1 Spare Parts

Pos.	Part	Type	Description	Part no.
1	Hand Probe	P60	With a rigid neck	590-890
2	C21 Probe Cable	3 m		590-161
		6 m		590-175
		9 m		590-165
3	Mains Cord Desktop Model			
		EU		591-146
		UK		591-147
		US		591-853
4	Battery Charger		To Sensistor Sentrac Portable Model	591-795
5	Carrying Case		To Sensistor Sentrac Portable Model	591-993
6	Sensor Key			598-147
7	Probe Tip Protection Cap		set of 50	591-273
			set of 500	590-625
8	Probe Tip Filter		set of 50	591-234
9	Fuse, 2A T slow		To Sensistor Sentrac Desktop Model	591-578
10	Hydrogen Sensor			590-292

19.2 Accessories
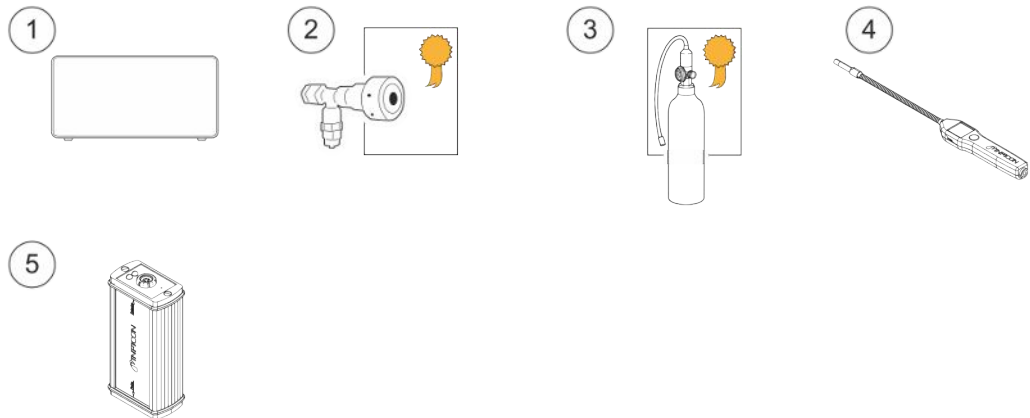
Pos.	Part	Type	Description	Part no.
1	Tracer Gas Filler	TGF11		Contact INFICON for further information
2	Calibration Leak		For calibration and function tests of probes	Contact INFICON for further information
3	Calibration Gas		For calibration and function tests of probes	Contact INFICON for further information
4	Hand Probe	P60-FLEX	With flexible neck	590-790
5	COMBOX60		Probe adapter	590-821

For a complete list of all spare parts and accessories, please contact:
support.sweden@inficon.com

20 Support from INFICON

20.1 How to Contact INFICON

For Sales and Customer Service, contact your nearest INFICON Service Center. The address can be found on the website: www.inficon.com

If you are experiencing a problem with your instrument, please have the following information readily available before contacting Customer Service:

- The serial number and firmware version for your instrument,

- A description of your problem,

- A description of any corrective action that you may have already attempted, and the exact wording of any error messages that you may have received.

20.2 Returning Components to INFICON

Please use the Product Return Form that was included with the product on delivery.

Do not return any component of your instrument to INFICON without first speaking with a Customer Service Representative. You must obtain a Return Material Authorization (RMA) number from the Customer Service Representative.

If you deliver a package to INFICON without an RMA number, your package will be held and you will be contacted. This will result in delays in servicing your instrument.

Prior to being given an RMA number, you may be required to complete a Declaration Of Contamination (DOC) form if your instrument has been exposed to process materials. DOC forms must be approved by INFICON before an RMA number is issued. INFICON may require that your probe be sent to a designated decontamination facility, not to the factory.

21 EU Declaration of Conformity

EU Declaration of Conformity

We – INFICON AB - herewith declare that the products defined below meet the basic requirements regarding safety and health and relevant provisions of the relevant EU Directives by design, type and the versions which are brought into circulation by us. This declaration of conformity is issued under the sole responsibility of INFICON AB.

In case of any products changes made without our approval, this declaration will be void

Designation of the product:

Sensistor Sentrac® Hydrogen Leak Detector

and either of following hand probes:

- **P60**
- **Strix**

Models:

Desktop model

Portable model

Type numbers:

SEN.122.160

SEN.122.161

SEN.122.162

SEN.122.163

The products meet the requirements of the following Directives:

- ***Directive 2014/35/EU (Low Voltage)***
- ***Directive 2014/30/EU (Electromagnetic Compatibility)***
- ***Directive 2011/65/EC (RoHS)***

Applied harmonized standards:

- ***EN 61000-6-3:2007***
- ***EN 61000-6-2:2005***
- ***EN 50581:2012***
- ***EN 61010-1:2010***
- ***EN 61326-1:2013***

Linköping, 09/10/2020

Fredrik Enquist, Development Manager

INFICON AB
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SE-581 02 Linköping
Sweden
Phone: +46 (0)13-355900
Fax: +46 (0)13-355901
www.inficon.com
E-mail: leakdetection@inficon.com

22 Disposing of the Instrument

According to EU legislation, this product must be recovered for separation of materials and may not be disposed of as unsorted municipal waste.

If you wish you can return this INFICON product to the manufacturer for recovery.

The manufacturer has the right to refuse taking back products that are inadequately packed and thereby presents safety and/or health risks to the staff.

The manufacturer will not reimburse you for the shipping cost.

Shipping address:
INFICON AB
Wahlbecksgatan 25A
SE-582 13 Linköping
Sweden

23 Appendix

23.1 Parameter index

Parameter	Range	Factory Default
Language		English
Operation Mode		Combined Mode
Unit		cc/s
Calibration Value	>0 <1E+30	2.20E-5
Calibration Sampling Time (s)	>2	8
Leak Gas		Air
Viscosity (uPas)	>0 <1E+30	18.2
Density (g/l)	>0 <1E+30	1.20
Interval Reminder active		Off
Days	0-255	0
Hours	0-23	0
Minutes	0-59	0
Sensitivity	1-15	8
Locating Range		Auto
Reject Indication		On
Locating Audio Ready Pulse		On
Direct Sensitivity Adjustment		On
Locating Audio Threshold (%)	0-100%	0
Measuring Unit		cc/s
Correlation Value	>0 <1E+30	1.00
Displayed Gas		Air
Displayed Gas Viscosity (uPas)	>0 <1E+30	18.2
Displayed Gas Density (g/l)	>0 <1E+30	1.20
Show Gas Name		On
Reject Level	1.0E-30 to 1.0E+30	1.0E-4
Chopped Audio Signal		Off
Probe Lamp Flash		Off
Show Reject Level		Off
Min Presentation Time (s)	0.1-100.0	1.0
Display Threshold	0-100%	0
Measuring Audio Threshold (%)	0-100%	0

Parameter	Range	Factory Default
Measuring Audio Ready Pulse		On
3 digits in measure value		Off
I•Guide Mode		Off
I•Guide Measuring Time (s)	min 0.5 s max 1000 s	5.0
I•Guide Positions	1-25	4
Probe Button Function		No function
Probe Lamp		Off
Recipes active		Off
Brightness	1-17	15
Screen saver		Off
Base frequency (Hz)	0, 300, 400, 500, 600, 700	400
Mute speaker if headphone		Off
Mute speaker in screen save mode		Off
Parameter	Range	Factory Default

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INFICON Inspired by visions. Proven by success.