



## testo · Smart Probes

Instruction manual



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## 2 Safety and the environment

### 2.1. About this document

#### Use

- > Please read this documentation through carefully and familiarize yourself with the product before putting it to use. Pay particular attention to the safety instructions and warning advice in order to prevent injuries and damage to the products.
- > Keep this document to hand so that you can refer to it when necessary.
- > Hand this documentation on to any subsequent users of the product.

#### Symbols and writing standards

| Representation                                                                      | Explanation                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | Warning advice, risk level according to the signal word:<br><b>Warning!</b> Serious physical injury may occur.<br><b>Caution!</b> Slight physical injury or damage to the equipment may occur.<br>> Implement the specified precautionary measures. |
|  | Note: Basic or further information.                                                                                                                                                                                                                 |
| 1. ...<br>2. ...                                                                    | Action: more steps, the sequence must be followed.                                                                                                                                                                                                  |
| > ...                                                                               | Action: a step or an optional step.                                                                                                                                                                                                                 |
| - ...                                                                               | Result of an action.                                                                                                                                                                                                                                |
| <b>Menu</b>                                                                         | Elements of the instrument, the instrument display or the program interface.                                                                                                                                                                        |
| <b>[OK]</b>                                                                         | Control keys of the instrument or buttons of the program interface.                                                                                                                                                                                 |
| ...   ...                                                                           | Functions/paths within a menu.                                                                                                                                                                                                                      |
| "..."                                                                               | Example entries                                                                                                                                                                                                                                     |

## **2.2. Ensure safety**

- > Do not operate the instrument if there are signs of damage at the housing, mains unit or feed lines.
- > Do not perform contact measurements on non-insulated, live parts.
- > Do not store the product together with solvents. Do not use any desiccants.
- > Carry out only the maintenance and repair work on this instrument that is described in the documentation. Follow the prescribed steps exactly. Use only original spare parts from Testo.
- > Dangers may also arise from the systems being measured or the measuring environment: Note the safety regulations valid in your area when performing the measurements.

### **2.2.1. Safety and the testo 510i/605i**

- Magnetic field
- May be harmful to those with pacemakers.
- > Keep a minimum distance of 10 cm between pacemaker and instrument.

### **2.2.2. Safety and the testo 549i**

- Risk of injury due to pressurized, hot, cold or toxic refrigerants/media!
- > Only to be used by qualified staff.
- > Wear protective goggles and safety gloves.
- > Before applying pressure to the measuring instrument: always fix the instrument tightly onto the pressure connection
- > Comply with the permissible measuring range (0 to 60 bar). Pay particular attention to this in systems with R744 refrigerant, since these are frequently operated at higher pressures!

### **2.2.3. Safety and the testo 805i**

- Laser radiation! Class 2 laser
- > Do not look into the laser beam!

## 2.3. Protecting the environment

- > Dispose of faulty rechargeable batteries/spent batteries in accordance with the valid legal specifications.
- > At the end of its useful life, send the product to the separate collection for electric and electronic devices (observe local regulations) or return the product to Testo for disposal.

## 3 Specifications

Testo Smart Probes are different hand-held measuring instruments for various applications that communicate with your mobile terminal devices by means of an app. The respective Smart Probe performs the measurement and is operated by your mobile terminal device. The various Smart Probes allow you to measure the temperature, humidity, flow, and volume flow at the outlet, or perform pressure, differential pressure, and non-contact temperature measurements in the duct.

## 4 Product description

### 4.1. Overview of Smart Probes



- 1 Measuring unit
- 2 LED
- 3 Key
- 4 Battery compartment (at the back)
- 5 Direction of flow testo 405i / testo 410i (not shown)  
(An arrow on the top of the housing displays the direction of flow in which the measuring instrument has been calibrated and which achieves the best measurement results. Please note the direction of flow during usage.)

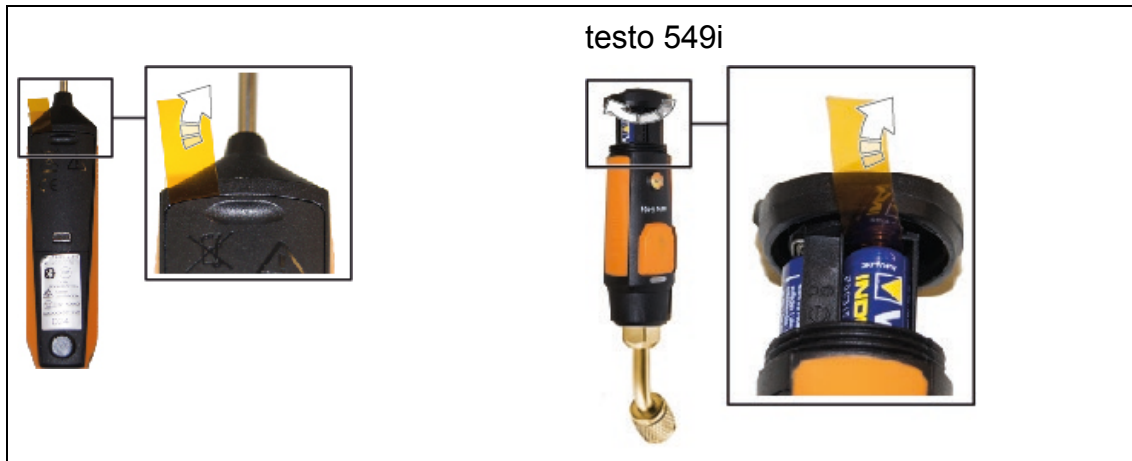
### 4.2. LED status

| LED status      | Meaning                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flashing red    | Low battery status                                                                                                                                          |
| Flashing yellow | <ul style="list-style-type: none"><li>• Smart Probe is switched on.</li><li>• Smart Probe is searching for a BT connection, but is not connected.</li></ul> |
| Flashing green  | <ul style="list-style-type: none"><li>• Smart Probe is switched on.</li><li>• Bluetooth is connected.</li></ul>                                             |



## 5 First steps

### 5.1. Switching on/off



#### 5.1.1. Switching on

1. Pull the film out of the battery compartment.
2. Press the button on your Smart Probe.
  - The Smart Probe switches on.

#### 5.1.2. Switching off

1. Press and hold the button on your Smart Probe.
  - The Smart Probe switches off.

### 5.2. Establishing Bluetooth® connection



You need a tablet or smartphone with the testo Smart Probes App already installed on it to be able to establish a Bluetooth connection. You can get the App for iOS instruments in the App Store or for Android instruments in the Play Store.

Compatibility:

- requires iOS 8.3 or later/Android 4.3 or later
- requires Bluetooth 4.0

- 
- ✓ The testo App Smart Probe is installed on your terminal device and ready for use.
  - 1. Press the button on the Smart Probe.
    - The Smart Probe switches on.

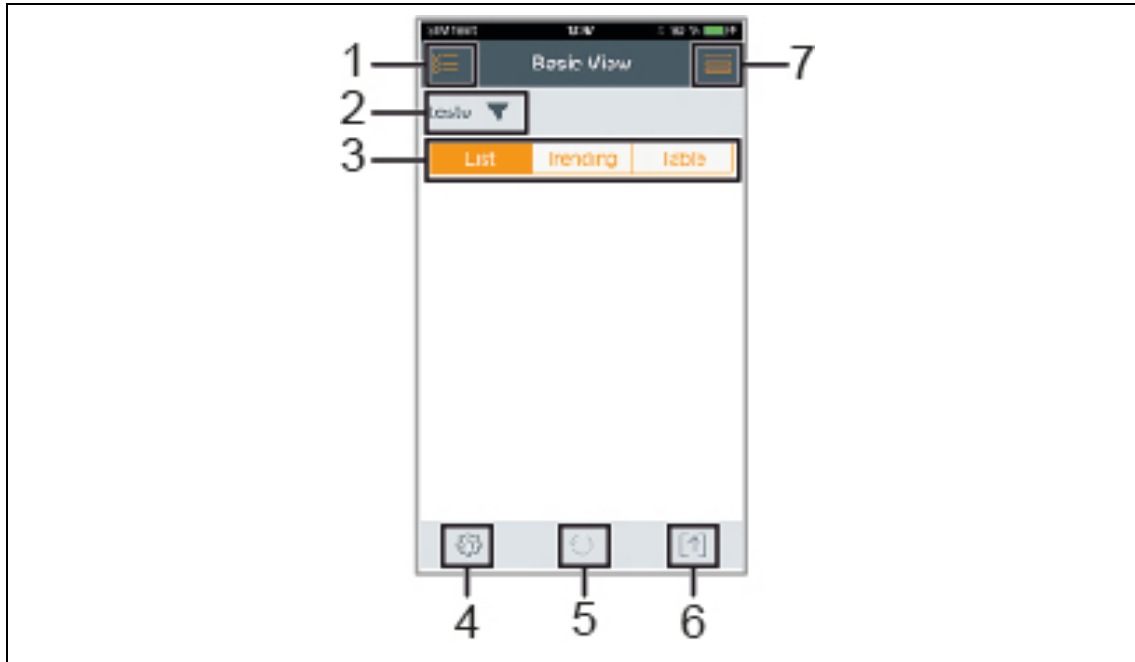
- The LED flashes yellow while connecting via Bluetooth and then flashes green once the connection is established.
- The connection between the Smart Probe and your mobile terminal device is established.

### **5.3. Transmitting readings**

- ✓ The Smart Probe is switched on and connected to your mobile terminal device via Bluetooth.
- The current readings are automatically displayed in the App.

## 6 Using the App

### 6.1. Overview of operating controls



- 1  Choice of applications.
- 2  Display of connected Smart Probes.
- 3 Switch between the views (list, graphic diagram, table)
- 4  Measurement settings. (The menu changes depending on the Smart Probe connected and the application selected)
- 5  Restarts the measuring value recording in graph and table format.
- 6  Export the readings.
- 7  Options menu

## 6.2. App options

### 6.2.1. Set “Language”

1. Tap  -> **Settings** -> **Language**.
  - A selection list is displayed.
2. Tap the required language.
  - The selected language receives a green check mark.
3. Tap ◀ several times until the measurement view is displayed.
  - The language has been changed.

## 6.2.2. Display Tutorial

---



The **Tutorial** guides you through the first steps when operating the testo Smart Probes App.

1. Tap  -> **Tutorial**
  - The **Tutorial** is displayed. In **Tutorial**, swipe to display the next page.
2. Tap X to close the **Tutorial**.

## 6.2.3. Show help

---



An internet connection is required to display the testo website.

1. Tap  -> **Help**
  - The page **Fehler! Linkreferenz ungültig.** is displayed.

## 6.2.4. Display testo website

---



An internet connection is required to display the testo website.

1. Tap  -> **About/Link** -> **Testo**
  - The page **Fehler! Linkreferenz ungültig.** is displayed.

## 6.2.5. Display App Info

---



In App Info you can find the version number of the installed App.

1. Tap  -> **About/Link** -> **Info**
  - The App's version number is displayed, as well as the ID.
2. Tap ◀ several times until the measurement view is displayed.

## 6.3. Application menus

### 6.3.1. Selecting the application menu

1. Press .
  - A selection of menus for various applications is displayed.
2. Select the required application.
  - The selection disappears and your selected application is displayed.

### 6.3.2. Setting favourites

1. Press .
  - A selection of applications is displayed.
2. Press  next to the application that you would like to designate as a favourite.
  - The asterisk is displayed in orange , and the selected application is listed under **Show Favorites**.

### 6.3.3. Displaying information about an application

1. Press .
  - A selection of applications is displayed.
2. Press .
  - The information about an application is displayed.

## 6.4. Displaying Smart Probe details

- ✓ One or more Smart Probes are connected to your mobile terminal device via Bluetooth.
1. Press .
    - All connected Smart Probes are displayed in this list.
  2. Select the Smart Probe to display the details you would like to see.
    - A list appears with the details for the Smart Probe.
  3. Press **Close** to exit the detailed view.

## 6.5. List, graphic diagram and table view

The available readings can be displayed in different ways in the various views.

- List view  
Displays the readings transmitted by the Smart Probe in the form of a list. Readings from all connected Smart Probes are displayed here.
- Graphic diagram view  
The graphical progression of up to four different readings can be displayed. Tap on a reading above the diagram to select the readings to be displayed.
- Table view  
In the Table view, all readings are displayed in sequence according to date and time. The different readings from the individual Smart Probes can be selected by pressing  .

## 6.6. Settings view

1. Press  and select **Edit View**.
  - An overview of all Smart Probes and their measurement parameters is displayed.
2. Move the required reading up or down to the position it should be.
3. Press  to hide a Smart Probe reading.
4. Press  to select the unit for a reading.
5. Press **OK** to confirm your settings

## 6.7. Retaining readings

Readings are retained in the “**List**” view; in the “**Trend**” and “**Table**” view, the current readings are still displayed.

- ✓ The Smart Probe is switched on, connected to your mobile terminal device via Bluetooth, and readings are transmitted.
1. Press the button on your Smart Probe.
    - The current reading is retained.
  2. Press the key again.
    - The instrument again displays the current readings.

## 6.8. Exporting readings

### 6.8.1. Excel (CSV) Export

1. Press .
  - A selection of export options appears.
2. Press **Export Excel (CSV)**.
  - A list of readings is displayed.
3. Press .
  - A selection of sending/export options appears.
4. Select your required sending/export options.

### 6.8.2. PDF Export

1. Press .
  - A selection of export options appears.
2. Press **Export PDF**.
  - A PDF is created and saved on your mobile terminal device (Android only) or sent via e-mail (iOS and Android).
3. Press **Done** to exit the detailed view.

### 6.8.3. Exporting a graph

1. Press .
- A selection of export options appears.
2. Press **Export Graph**.
- An image file of the trend display is created.
3. Press .
- A selection of sending/export options is displayed.
4. Tap on the sending/export option you need.

## 7 Maintaining the product

### 7.1. Maintaining Smart Probes

#### **Cleaning the instrument**

- > Do not use any aggressive cleaning agents or solvents!
- > Mild household cleaning agents or soap suds may be used.
- > If the housing of the instrument is dirty, clean it with a damp cloth.

#### **Keeping connections clean**

- > Keep connections clean and free of grease and other deposits, clean with a damp cloth as required.

#### **Ensuring measuring accuracy**

- > Testo Customer Service would be glad to further assist you if you so wish.
- > Keep within the permissible measuring range!
- > Calibrate instrument regularly (recommendation: once a year).

### 7.2. Smart Probes App

The testo Smart Probes App is kept updated via the Play Store for Android devices and the App Store for iOS devices. Please update the App as soon as a new update is available. We therefore recommend that you do not disable automatic notifications when new updates are available.

## 8 Tips and assistance

### 8.1. Questions and answers

| Question                                                   | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LED flashes red                                            | <ul style="list-style-type: none"> <li>Batteries are almost spent.</li> <li>Change batteries.</li> </ul>                                                                                                                                                                                                                                                                                                                                                             |
| The instrument switches itself off                         | Remaining battery capacity insufficient<br>> Change the batteries.                                                                                                                                                                                                                                                                                                                                                                                                   |
| --- lights up instead of the measurement parameter display | <ul style="list-style-type: none"> <li>Outside the permissible measuring range.</li> </ul> > Keep within the permissible measuring range.<br>or<br><ul style="list-style-type: none"> <li>Sensor is defective</li> </ul> > Contact your testo Service department.                                                                                                                                                                                                    |
| The App cannot be found in the store                       | <ul style="list-style-type: none"> <li>No correct search terms were entered.</li> </ul> > Enter an unambiguous search term, e.g.: "testo Smart Probes" or use the link on the testo website.<br>or<br><ul style="list-style-type: none"> <li>Your mobile terminal device does not meet the technical requirements (iOS 8.3 or later, Android 4.3 or later / Bluetooth 4.0 (Low Energy))</li> </ul> > Please check the technical data for your mobile terminal device |

### 8.2. Accessories and spare parts

| Designation                                                                                                                                                 | Item number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| testo Smart Case (Refrigeration) for storing and transporting 2 × testo 115i and 2 × testo 549i, dimensions 250 × 180 × 70 mm                               | 0516 0240   |
| testo Smart Case (Heating) for storing and transporting testo 115i, testo 410i, testo 510i, testo 549i and testo 805i, dimensions 250 × 180 × 70 mm         | 0516 0270   |
| testo Smart Case (VAC) for storing and transporting testo 405i, testo 410i, testo 510i, testo 605i, testo 805i and testo 905i, dimensions 270 × 190 × 60 mm | 0516 0250   |



## 9 Technical data

### 9.1. Bluetooth module



The use of the wireless module is subject to the regulations and stipulations of the respective country of use, and the module may only be used in each case in countries for which a country certification has been granted.

The user and every owner undertake to adhere to these regulations and prerequisites for use, and acknowledge that the re-sale, export, import, etc. in particular in, to or from countries without wireless permits, is their responsibility.

### 9.2. General technical data



All accuracy specifications apply at a nominal temperature of 22 °C.

#### 9.2.1. testo 905i

| Feature                         | Values                                                                           |
|---------------------------------|----------------------------------------------------------------------------------|
| Measuring range                 | -50 to 150 °C / -58 to 302 °F                                                    |
| Accuracy ± 1 digit              | ± 1 °C / ± 1.8 °F                                                                |
| Resolution                      | 0.1 °C / 0.1 °F                                                                  |
| Measurement rate                | 1/sec                                                                            |
| Available units of measurement  | °C, °F                                                                           |
| Storage temperature             | -20 °C to 60 °C / -4 to 140 °F                                                   |
| Operating temperature           | -20 °C to +50 °C / -4 to 122 °F                                                  |
| Battery type                    | 3 micro batteries AAA                                                            |
| Battery life                    | 150 h                                                                            |
| Dimensions                      | 222 mm × 30 mm × 24 mm<br>Probe shaft length 100 mm<br>Probe shaft diameter 4 mm |
| Directives, standards and tests | EU guideline: 2014/30/EU                                                         |

**9.2.2. testo 410i**

| Feature                         | Values                                                                                                      |
|---------------------------------|-------------------------------------------------------------------------------------------------------------|
| Measuring range                 | 0.4 to 30 m/s / 80 to 5,900 fpm<br>-20 to 60 °C / -4 to 140 °F                                              |
| Accuracy ± 1 digit              | ± (0.2 m/s + 2% of m.v.) (0.4 to 20 m/s)<br>± (40 fpm + 2% of m.v.) (80 to 4,000 fpm)<br>± 0.5 °C / ±0.9 °F |
| Resolution                      | 0.1 °C / 0.1 °F<br>0.1 m/s / 1 fpm                                                                          |
| Measurement rate                | 1/sec                                                                                                       |
| Available units of measurement  | °C, °F, m/s, fpm, m³/h, cfm, l/s                                                                            |
| Storage temperature             | -20 °C to 60 °C / -4 to 140 °F                                                                              |
| Operating temperature           | -20 °C to +50 °C / -4 to 122 °F                                                                             |
| Battery type                    | 3 micro batteries AAA                                                                                       |
| Battery life                    | 130 h                                                                                                       |
| Dimensions                      | 154 mm × 43 mm × 21 mm<br>40 mm vane diameter                                                               |
| Directives, standards and tests | EU guideline: 2014/30/EU                                                                                    |

**9.2.3. testo 405i**

| Feature                      | Values                                                                                                                                                                                            |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measuring range <sup>1</sup> | 0 to 30 m/s / 0 to 5,900 fpm<br>-20 to 60 °C / -4 to 140 °F                                                                                                                                       |
| Accuracy ± 1 digit           | ± (0.1 m/s + 5% of m.v.) (0 to +2 m/s)<br>± (0.3 m/s + 5% of m.v.) (2 to +15 m/s)<br>± (20 fpm + 5% of m.v.) (0 to +394 fpm)<br>± (59 fpm + 5% of m.v.) (394 to +3.000 fpm)<br>± 0.5 °C / ±0.9 °F |
| Resolution                   | 0.01 m/s / 1 fpm<br>0.1 °C / 0.1 °F                                                                                                                                                               |

<sup>1</sup> Please switch on the Smart Probe in the following ambient conditions: > 10 °C, air velocity 0 m/s = protective cap closed to enable the sensor to heat up.

| Feature                         | Values                                                                                                         |
|---------------------------------|----------------------------------------------------------------------------------------------------------------|
| Measurement rate                | 1/sec                                                                                                          |
| Available units of measurement  | °C, °F, m/s, fpm, m³/h, cfm, l/s                                                                               |
| Storage temperature             | -20 °C to 60 °C / -4 to 140 °F                                                                                 |
| Operating temperature           | -20 °C to +50 °C / -4 to 122 °F                                                                                |
| Battery type                    | 3 micro batteries AAA                                                                                          |
| Battery life                    | 15 hrs                                                                                                         |
| Dimensions                      | 200 mm × 30 mm × 41 mm<br>Extendible telescope 400 mm<br>Probe shaft diameter 12 mm<br>Probe tip diameter 9 mm |
| Directives, standards and tests | EU guideline: 2014/30/EU                                                                                       |

#### 9.2.4. testo 549i

| Feature                         | Values                                 |
|---------------------------------|----------------------------------------|
| Measuring range                 | 0 to 60 bar (rel) / 0 to 870 psi (rel) |
| Overpressure                    | 65 bar                                 |
| Accuracy ± 1 digit              | 0.5% of full scale value               |
| Resolution                      | 0.01 bar / 0.1 psi                     |
| Measurement rate                | 2/sec                                  |
| Available units of measurement  | bar, psi, MPa, kPa                     |
| Connection                      | 1× 7/16" UNF / 1/4" SAE connection     |
| Overload rel.                   | 65 bar                                 |
| Storage temperature             | -20 °C to 60 °C / -4 to 140 °F         |
| Operating temperature           | -20 °C to +50 °C / -4 to 122 °F        |
| Battery type                    | 3 micro batteries AAA                  |
| Battery life                    | 130 hrs                                |
| Measurable media                | CFC, HFC, HCFC, N, H2O, CO2            |
| Dimensions                      | 152 mm x 35 mm x 35 mm                 |
| Directives, standards and tests | EU guideline: 2014/30/EU               |

**9.2.5. testo 805i**

| Feature                         | Values                                                                                                                                                                                                        |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measuring range                 | -30 °C to 250 °C / -22 to 482 °F                                                                                                                                                                              |
| Accuracy ± 1 digit              | ± 1.5 °C or ± 1.5% of m.v. (0 to 250 °C)<br>± 2.0 °C (-20.0 to -0.1 °C)<br>± 2.5 °C (-30.0 to -20.1 °C)<br><br>± 2.7 °F or ± 1.5% of m.v. (32 to 482 °F)<br>± 3.6 °F (-4 to 32 °F)<br>± 4.5 °F (-22 to -4 °F) |
| Resolution                      | 0.1 °C / 0.1 °F                                                                                                                                                                                               |
| Measurement rate                | 2/sec                                                                                                                                                                                                         |
| Available units of measurement  | °C, °F                                                                                                                                                                                                        |
| Connection                      | 7/16" – UNF                                                                                                                                                                                                   |
| Storage temperature             | -20 °C to 60 °C / -4 to 140 °F                                                                                                                                                                                |
| Operating temperature           | -10 °C to +50 °C / 14 to 122 °F                                                                                                                                                                               |
| Battery type                    | 3 micro batteries AAA                                                                                                                                                                                         |
| Battery life                    | 30 hrs                                                                                                                                                                                                        |
| Optics                          | 10:1                                                                                                                                                                                                          |
| Laser marking                   | Diffraction lens as laser marking (laser circle)                                                                                                                                                              |
| Dimensions                      | 140 mm × 36 mm × 25 mm                                                                                                                                                                                        |
| Emission level                  | Adjustable from 0.1 to 1.0                                                                                                                                                                                    |
| Directives, standards and tests | EU guideline: 2014/30/EU                                                                                                                                                                                      |

**9.2.6. testo 605i**

| Feature         | Values                                   |
|-----------------|------------------------------------------|
| Measuring range | -20 to 60 °C, -4 to 140 °F, 0 to 100% RH |

| Feature                         | Values                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accuracy $\pm 1$ digit          | $\pm 0.8$ °C (-20 ... 0 °C) / $\pm 1.44$ °F (-4 ... 32 °F)<br>$\pm 0.5$ °C (0 ... +60 °C) / $\pm 0.9$ °F (32 ... 140 °F)<br>$\pm 3.0$ %RH (10%RH...35%RH)<br>$\pm 2.0$ %RH (35%RH...65%RH)<br>$\pm 3.0$ %RH (65%RH...90%RH)<br>$\pm 5.0$ %RH (<10%RH or >90%RH)<br>@ 25°C $\pm 1$ °C<br>Hysteresis: $\pm 1.0$ %RH<br>Long term stability/year : $\pm 1.0$ %RH/year |
| Resolution                      | 0.1 °F / 0.1 °C<br>0.1% RH                                                                                                                                                                                                                                                                                                                                         |
| Measurement rate                | 1/sec                                                                                                                                                                                                                                                                                                                                                              |
| Available units of measurement  | °C, °F, %RH, °Ctd, °Ftd, wetbulb °C, wetbulb °F                                                                                                                                                                                                                                                                                                                    |
| Storage temperature             | -20 °C to 60 °C / -4 to 140 °F                                                                                                                                                                                                                                                                                                                                     |
| Operating temperature           | -20 °C to +50 °C / -4 to 122 °F                                                                                                                                                                                                                                                                                                                                    |
| Battery type                    | 3 micro batteries AAA                                                                                                                                                                                                                                                                                                                                              |
| Battery life                    | 150 h                                                                                                                                                                                                                                                                                                                                                              |
| Dimensions                      | 218 mm $\times$ 30 mm $\times$ 27 mm<br>Probe shaft length 90 mm                                                                                                                                                                                                                                                                                                   |
| Directives, standards and tests | EU guideline: 2014/30/EU                                                                                                                                                                                                                                                                                                                                           |

### 9.2.7. testo 510i

| Feature                | Values                                                                                                                                                                            |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measuring range        | -150 ... 150 hPa / 60 in wc                                                                                                                                                       |
| Accuracy $\pm 1$ digit | $\pm 0.05$ hPa (0 to 1.00 hPa) /<br>$\pm 0.02$ in wc (0 to 0.4 in wc)<br><br>$\pm 0.2$ hPa + 1.5% of m.v. (1.01 to 150 hPa)<br>$\pm 0.08$ in wc + 1.5% of m.v. (0.41 to 60 in wc) |
| Overpressure           | 500 mbar                                                                                                                                                                          |
| Resolution             | 0.01 hPa / 0.01 inch wc                                                                                                                                                           |
| Measurement rate       | 2/sec                                                                                                                                                                             |

| Feature                         | Values                                                                                                                          |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Available units of measurement  | mbar, hPa, Pa, mmHg, inHg, in WC, psi, mmWC<br>In conjunction with Pitot tube (optional): m/s, fpm, m <sup>3</sup> /h, cfm, l/s |
| Storage temperature             | -20 °C to 60 °C / -4 to 140 °F                                                                                                  |
| Operating temperature           | -20 °C to +50 °C / -4 to 122 °F                                                                                                 |
| Battery type                    | 3 micro batteries AAA                                                                                                           |
| Battery life                    | 150 hrs                                                                                                                         |
| Dimensions                      | 148 × 36 × 23 mm                                                                                                                |
| Directives, standards and tests | EU guideline: 2014/30/EU                                                                                                        |

### 9.2.8. testo 115i

| Feature                         | Values                                              |
|---------------------------------|-----------------------------------------------------|
| Measuring range                 | -40 to 150 °C / -58 to 302 °F                       |
| Accuracy ± 1 digit              | ± 1.3 °C (-20 to 85 °C)<br>± 2.34 °F (-4 to 185 °F) |
| Resolution                      | 0.1 °C / 0.1 °F                                     |
| Measurement rate                | 1/sec                                               |
| Available units of measurement  | °C, °F                                              |
| Storage temperature             | -20 °C to 60 °C / -4 to 140 °F                      |
| Operating temperature           | -20 °C to +50 °C / -4 to 122 °F                     |
| Battery type                    | 3 micro batteries AAA                               |
| Battery life                    | 150 h                                               |
| Dimensions                      | 183 mm × 90 mm × 30 mm<br>max. 35 mm pipe diameter  |
| Directives, standards and tests | EU guideline: 2014/30/EU                            |

# 10 Certifications

## Module Lierda L Series BLE Module

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Product   | testo 115i, testo 405i, testo 410i, testo 510i, testo 549i, testo 605i, testo 805i, testo 905i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |
| Mat.-No.  | 0560 1115, 0560 1405, 0560 1410, 0560 1510, 0560 1549, 0560 1605, 0560 1805, 0560 1905                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |
| Country   | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |
| Australia |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | E 1561 |
| Brazil    |   <br>  <br>   <p>“Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.”</p> |        |
| Canada    | Product IC ID:<br>testo 115i IC ID: 12231A-1115<br>testo 405i IC ID: 12231A-1405<br>testo 410i IC ID: 12231A-1410<br>testo 510i IC ID: 12231A-1510<br>testo 549i IC ID: 12231A-1549<br>testo 605i IC ID: 12231A-1605<br>testo 805i IC ID: 12231A-1805<br>testo 905i IC ID: 12231A-1905<br>see IC Warnings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| China         | <p>CMII ID:</p> <p>testo 115i CMIIT ID: 2015DP6557</p> <p>testo 405i CMIIT ID: 2015DP6558</p> <p>testo 410i CMIIT ID: 2015DP6612</p> <p>testo 510i CMIIT ID: 2015DP6559</p> <p>testo 549i CMIIT ID: 2015DP6560</p> <p>testo 605i CMIIT ID: 2015DP6561</p> <p>testo 805i CMIIT ID: 2015DP6562</p> <p>testo 905i CMIIT ID: 2015DP6563</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Europa + EFTA | <p></p> <p> The EU Declaration of Conformity can be found on the testo homepage under the product specific downloads.</p> <p><b>EU countries:</b><br/>         Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY).</p> <p><b>EFTA countries:</b><br/>         Iceland, Liechtenstein, Norway, Switzerland</p> |
| Hongkong      | Authorized                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Japan | <p>testo 115i</p>  204-540016 <p>testo 405i</p>  204-540017 <p>testo 410i</p>  204-540018 <p>testo 510i</p>  204-540019 <p>testo 549i</p>  204-540020 <p>testo 605i</p>  204-540021 <p>testo 905i</p>  204-540023 <p>see Japan Information</p> |
| Korea |  <p>testo 115i    Certification No. MSIP-CRM-Toi-115i</p> <p>testo 405i    Certification No. MSIP-CRM-Toi-405i</p> <p>testo 410i    Certification No. MSIP-CRM-Toi-410i</p> <p>testo 510i    Certification No. MSIP-CRM-Toi-510i</p> <p>testo 549i    Certification No. MSIP-CRM-Toi-549i</p> <p>testo 605i    Certification No. MSIP-CRM-Toi-605i</p> <p>testo 805i    Certification No. MSIP-CRM-Toi-805i</p> <p>testo 905i    Certification No. MSIP-CRM-Toi-905i</p> <p>see KCC Warning</p>                                                                                                                                                                                                                                                         |

|                    |                                                                                                                                                                                                                                                                                                                                     |                                                                                                   |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Taiwan             | testo 115i    NCC: CCAB16LP177FT0<br>testo 405i    NCC: CCAB16LP177AT3<br>testo 410i    NCC: CCAB16LP1770T1<br>testo 510i    NCC: CCAB16LP177DT9<br>testo 549i    NCC: CCAB16LP177ET1<br>testo 605i    NCC: CCAB16LP177BT5<br>testo 805i    NCC: CCAB16LP177CT7<br>testo 905i    NCC: CCAB16LP177GT2                                |                                                                                                   |
| Turkey             | Authorized                                                                                                                                                                                                                                                                                                                          |                                                                                                   |
| USA                | Product FCC ID:<br>testo 115i    FCC ID: 2ACVD-1115<br>testo 405i    FCC ID: 2ACVD-1405<br>testo 410i    FCC ID: 2ACVD-1410<br>testo 510i    FCC ID: 2ACVD-1510<br>testo 549i    FCC ID: 2ACVD-1549<br>testo 605i    FCC ID: 2ACVD-1605<br>testo 805i    FCC ID: 2ACVD-1805<br>testo 905i    FCC ID: 2ACVD-1905<br>see FCC Warnings |                                                                                                   |
| Russia             | Authorized                                                                                                                                                                                                                                                                                                                          |                                                                                                   |
| Philippines        | Authorized                                                                                                                                                                                                                                                                                                                          |                                                                                                   |
| South Africa       | testo 115i    TA-2016/1207<br>testo 405i    TA-2016/1201<br>testo 410i    TA-2016/1200<br>testo 510i    TA-2016/1199<br>testo 549i    TA-2016/1198<br>testo 605i    TA-2016/1204<br>testo 805i    TA-2016/1206<br>testo 905i    TA-2016/1205                                                                                        |                                                                                                   |
| Bluetooth SIG List | Bluetooth®                                                                                                                                                                                                                                                                                                                          | Range 15 m (free field)<br>(varies with the used mobile device)                                   |
|                    | Bluetooth® type                                                                                                                                                                                                                                                                                                                     | LSD Science & Technology Co., Ltd<br>L Series BLE Module (08 Mai 2013) based on TI<br>CC254X chip |
|                    | Qualified Design ID                                                                                                                                                                                                                                                                                                                 | B016552                                                                                           |

|  |                        |         |
|--|------------------------|---------|
|  | Bluetooth® radio class | Class 3 |
|  | Bluetooth® company ID  | 10274   |

### IC Warnings

This instrument complies with Part 15C of the FCC Rules and Industry Canada RSS-210 (revision 8). Commissioning is subject to the following two conditions:

- (1) This instrument must not cause any harmful interference and
- (2) this instrument must be able to cope with interference, even if this has undesirable effects on operation.

Cet appareil satisfait à la partie 15C des directives FCC et au standard Industrie Canada RSS-210 (révision 8). Sa mise en service est soumise aux deux conditions suivantes :

- (1) cet appareil ne doit causer aucune interférence dangereuse et
- (2) cet appareil doit supporter toute interférence, y compris des interférences qui provoqueraient des opérations indésirables.

### FCC Warnings

Information from the FCC (Federal Communications Commission)

#### For your own safety

Shielded cables should be used for a composite interface. This is to ensure continued protection against radio frequency interference.

### FCC warning statement

This equipment has been tested and found to comply with the limits for a Class C digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### Caution

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Shielded interface cable must be used in order to comply with the emission limits.

**Warning**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

**KCC Warning**

해당 무선 설비는 운용 중 전파혼신 가능성이 있음

**Japan Information**

当該機器には電波法に基づく、技術基準適合証明等を受けた特定無線設備を装着している。

**Module Lierda LSD4BT-S37**

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Product       | testo 115i, testo 549i, testo 605i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |
| Mat.-No.      | 0560 2115, 0560 2549, 0560 2605                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |
| Country       | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |
| Australia     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | E 1561 |
| Canada        | Product IC ID:<br>testo 115i: IC: 6127B-05602115<br>testo 549i: IC: 6127B-05602549<br>testo 605i: IC: 6127B-05602605<br>see IC Warnings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |
| Europa + EFTA | <br> The EU Declaration of Conformity can be found on the testo under the product specific downloads.<br><b>EU countries:</b><br>Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovakia (SK), Slovenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cyprus (CY).<br><b>EFTA countries:</b><br>Iceland, Liechtenstein, Norway, Switzerland |        |

| Turkey                 | Authorized                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|------------------|-------------------------|----------------|---------------------------------|------------------------|---|--------------------|-----------------------------------|---------|-----------------------|------------------------|-----------------|
| USA                    | testo 115i: WAF-05602115<br>testo 549i: WAF-05602549<br>testo 605i: WAF-05602605<br>see FCC Warnings                                                                                                                                                                                                                                                                                                                                                                    |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| Bluetooth® Information | <table> <tr> <th>Feature</th><th>Values</th></tr> <tr> <td>Bluetooth® range</td><td>Open air: typical 100 m</td></tr> <tr> <td>radio type</td><td>Bluetooth® Low Energy (BLE) 4.2</td></tr> <tr> <td>Bluetooth® radio class</td><td>1</td></tr> <tr> <td>Bluetooth® company</td><td>LSD Science &amp; Technology Co., Ltd</td></tr> <tr> <td>RF Band</td><td>BT LE: 2402 – 2480MHz</td></tr> <tr> <td>power output [E.I.R.P]</td><td>BT LE: 16.94dBm</td></tr> </table> | Feature | Values | Bluetooth® range | Open air: typical 100 m | radio type     | Bluetooth® Low Energy (BLE) 4.2 | Bluetooth® radio class | 1 | Bluetooth® company | LSD Science & Technology Co., Ltd | RF Band | BT LE: 2402 – 2480MHz | power output [E.I.R.P] | BT LE: 16.94dBm |
| Feature                | Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| Bluetooth® range       | Open air: typical 100 m                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| radio type             | Bluetooth® Low Energy (BLE) 4.2                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| Bluetooth® radio class | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| Bluetooth® company     | LSD Science & Technology Co., Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| RF Band                | BT LE: 2402 – 2480MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| power output [E.I.R.P] | BT LE: 16.94dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                         |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| Bluetooth® SIG List    | <table> <tr> <th>Feature</th><th>Values</th></tr> <tr> <td>Declaration ID</td><td>D043363</td></tr> <tr> <td>member company</td><td>Testo SE &amp; Co. KGaA</td></tr> </table>                                                                                                                                                                                                                                                                                          | Feature | Values | Declaration ID   | D043363                 | member company | Testo SE & Co. KGaA             |                        |   |                    |                                   |         |                       |                        |                 |
| Feature                | Values                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| Declaration ID         | D043363                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |
| member company         | Testo SE & Co. KGaA                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |        |                  |                         |                |                                 |                        |   |                    |                                   |         |                       |                        |                 |

### IC Warnings

#### RSS-Gen & RSS-247 statement:

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

#### Caution: Radio Frequency Radiation Exposure

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment and meets the IC radio frequency (RF) Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body in normal use position to ensure compliance with RF exposure requirement.

#### Co-Location:

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

#### Attention : exposition au rayonnement de radiofréquences

Cet équipement est conforme aux limites d'exposition aux radiofréquences IC fixées pour un environnement non contrôlé et aux Lignes directrices relatives à l'exposition aux radiofréquences (RF). Cet équipement doit être installé et utilisé en gardant le radiateur à une distance d'au moins 20 cm du corps humain en position normale d'utilisation pour garantir la conformité à l'exposition aux RF.

### **Co-location**

Ce transmetteur ne peut pas être installé en colocation ou être utilisé avec une autre antenne ou transmetteur, quel qu'en soit le type.

### **FCC Warnings**

Information from the FCC (Federal Communications Commission)

#### **For your own safety**

Shielded cables should be used for a composite interface. This is to ensure continued protection against radio frequency interference.

#### **FCC warning statement**

This equipment has been tested and found to comply with the limits for a Class C digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

#### **Caution**

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Shielded interface cable must be used in order to comply with the emission limits.

#### **Warning**

This device complies with Part 15 of the FCC Rules.  
Operation is subject to the following two conditions:  
(1) this device may not cause harmful interference, and  
(2) this device must accept any interference received,  
including interference that may cause undesired operation.

#### **Caution: Radio Frequency Radiation Exposure**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body in normal use position to ensure compliance with RF exposure requirement.

#### **Co-Location:**

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.



