Franklin Electric

CELLTRON GENSTART

CTS-655P BATTERY & ELECTRICAL DIAGNOSTIC ANALYZER

INSTRUCTION MANUAL

Contents

Chapter 1: Before You Begin

Starting the tester for the first time

When the tester is started for the first time the operator is asked to enter local language, local time and date information.

Changes can be made afterwards by going in to the Utility Menu and selecting CONFIG TESTER.

Safety

ENSURE ALL RELEVANT BEST OPERATING PRACTICES (BOP'S) ARE STRICTLY ADHERED TO WHEN CARRYING OUT ANY TASKS EXPLAINED IN THIS MANUAL.

Conventions Used in This Manual

To help you learn how to use your analyzer, the manual uses these symbols and typographical conventions:

The safety symbol followed by the word **WARNING** or **CAUTION** indicates instructions for avoiding hazardous conditions and personal injury.

CAUTION The word **CAUTION** without the safety symbol indicates instructions for avoiding equipment damage.

The wrench symbol indicates procedural notes and helpful information.

UP ARROW The text for keypad buttons and soft-key functions are in bold capital letters.

POST TYPE The text for screen options are in regular capital letters.

Utilization in accordance with "intended purpose"

The tester is to be used exclusively for its intended purpose. Utilization for any other purpose, or in any other manner, shall be deemed to be „not in accordance with the intended purpose". The manufacturer is not liable for any damage, inadequate or incorrect results arising out of such misuse.

Utilisation in accordance with the "intended purpose" also comprises

- carefully reading and obeying all operating instructions and safety and danger notices
- performing all stipulated inspection and servicing work.
- following all instructions from the battery and generator manufacturers.

Disposal

Do not dispose of this device with normal domestic waste!
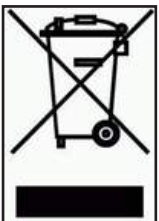
To comply with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility Any device that you no longer require must be returned to our agent, or find out about the approved collection and recycling facilities in your area. Ignoring this European Directive may have potentially adverse affects on the environment and your health! Please be aware that in other parts of the world local legislation should be followed.

Chapter 2: Description

Connections and Data Ports

❶ Integrated thermal printer

❷ Release lever for door to paper compartment

❸ Paper slot

❹ LCD screen with MAIN MENU

❺ Control Panel: keypad and power button

❻ 6-pin connector for the battery test cable

❼ Spring-loaded data card slot for test data storage and software upgrades.

❽ Infrared temperature sensor with a range of -28 °C to +93 °C (-20 °F to +200 °F).

❾ Data transmitter: sends test results to a PC using an optional hardware and software kit

Connecting the Battery Test Cable

⚠️ **CAUTION:** To prevent damage to the analyzer's circuitry, do not connect the analyzer to a voltage source greater than 30 Vdc.

To connect the battery test cable to the analyzer align the arrow on the cable connector with the arrows on the analyzer's housing. Hold the part of the cable connector as shown and firmly insert the connector into analyzer's six-pin receptacle. **Do not twist.**

To avoid damaging the battery test cable, always hold the ridged part of the cable connector (as shown in the photo) when inserting and removing the cable.
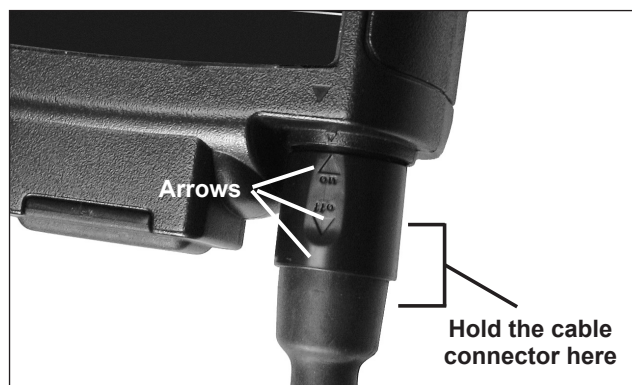
Removing and Inserting the Data Card

The battery tester is delivered with an SD card installed in the data card slot to protect it from dust and debris. To remove the SD card, push briefly on its edge to release it and pull it from the slot.

When inserting a card, push it into the slot until it locks. The card is correctly inserted when it is not protruding from the slot. To protect the card slot and enable the analyzer to read and write to the card, leave the card in the slot.

Display and Keypad

The keypad and display work together to help you quickly find and use the right tools at the right time. The display also keeps you on track with on-screen navigation aids, directions and messages.
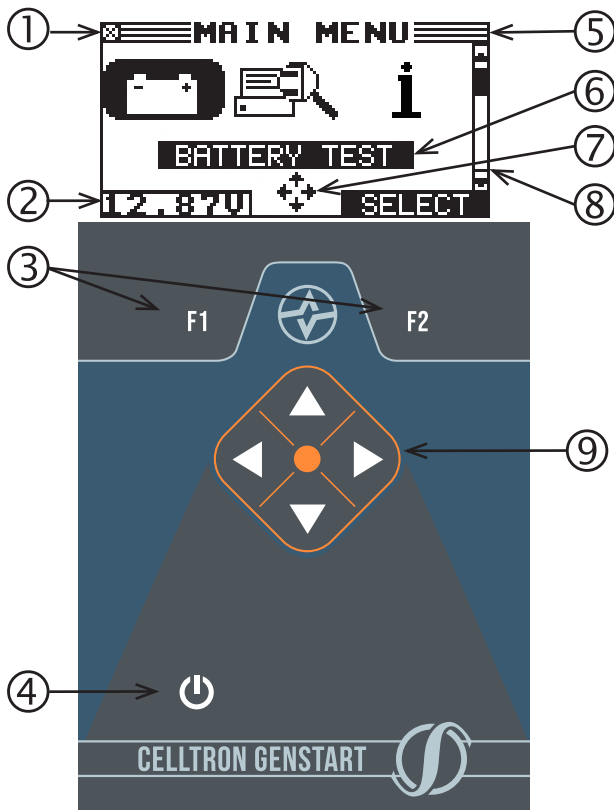
❶ Internal Batteries Status Indicator

This indicator appears in the screen's top left corner, lets you know the status and charge level of the analyzer's six 1.5-volt batteries. The **X** in the top left corner of the screen shows that the analyzer is powered by the battery you're testing to conserve the analyzer's internal batteries.

❷ Voltmeter

When you first connect the analyzer to a battery it functions as a voltmeter. The voltage reading appears above the left soft key until you move to other menus or functions.

❸ Soft Keys

Press the two **Soft Keys** linked to the bottom of the screen to perform the functions displayed above them. The functions change depending on the menu or test process. So it may be helpful to think of the words appearing above them as part of the keys. Some of the more common soft-key functions are **SELECT**, **BACK,** and **END**.

❹ POWER Key

Press the **POWER** button to turn the analyzer on and off. The analyzer also turns on automatically when you connect its test leads to a battery.

❺ Title Bar

The title bar shows you the name of the current menu, test tool, utility, or function.

❻ Selection Area

The selection area below the Title Bar contains selectable items or dialog boxes that display information or require a response.

❼ Menu Screen Arrows

When displayed in menu screens, the menu screen arrows show you which **ARROW** key on the keypad to press to display other icons or screens. The Up and Down Menu Screen Arrows, for example, indicate when to press the **UP ▲** and **DOWN ▼ ARROW** keys to display the screens above and below the current screen. The Left and Right Menu Screen Arrows tell you when to use the **LEFT ◀** or **RIGHT ▶ ARROW** keys to select an icon. When displayed under a list of options, the menu screen arrows show you which keypad arrow to press to highlight a character or item in a list.

❽ Scroll Bar

Another navigational aid is the scroll bar on the right side of the screen. The position of its scroll box shows you whether the screen is the top (or only screen), middle, or last in a series.

❾ Arrow keys

Press the **UP** or **LEFT ARROW** key to move up to the next selectable item or row. When entering text, use the **UP** or **LEFT ARROW** key to move to the previous character.

Data Entry Methods

To perform a particular test or function, the tester will ask for different types of information. This means that the methods you use to enter information will change depending on the type of information requested. The four types of entry methods are described below.

Typically, the soft key below the right half of the screen confirms your choice, although the word above it may vary. In a similar fashion, the soft key below the left half of the screen cancels your choice or returns you to the previous screen, although the word above it may also vary.

Menu icons

A menu icon is a graphical representation of a function you can select. To select an icon, use the **LEFT** or **RIGHT ARROW** key to highlight it. Highlighting changes the icon to a white picture on a black background. To confirm your selection, press the appropriate soft key.

Option Buttons

Some lists have option buttons before each item. To select an item, use the **UP/DOWN ARROW** keys to move the dot into the button next to the item you want. You can also use the alphanumeric keypad to enter the number preceding the option button. To confirm your selection, press the appropriate soft key.

Scrolling Lists

Scrolling lists contain items that extend above and below the screen or the selection box that contains them. To indicate that there are more items, the symbols ⬍ appear to the right of the first visible or highlighted item on the list. To select from this type of list, use the **UP/DOWN ARROW** keys to scroll to the item, or use the keypad to enter your choice, and press the appropriate soft key.

Numeric Entries

Even though the tester does not use a numeric keypad it is possible to enter numeric values. When applicable the numeric values appear on the display. Use the **UP/DOWN or LEFT/RIGHT ARROW** keys to scroll and confirm this with the ▶ key. To return one or more steps use the ◀ key.

Menu Maps

This section will help you get to your destination while letting you know what test leads you may need when you arrive. The test leads are represented by symbols for their connectors.

Main Menu

The MAIN MENU is the starting point for all tools and utilities, which are depicted as icons. Some icons lead directly to the function they represent, while others are menu icons that lead to two or more functions. Menu icons are marked here with an asterisk (∗) and are mapped on the following pages.

MAIN MENU (Screen 1)

Tests a battery, or batteries, using the battery information you select in a series of screens.

Enables you to view your stored test results and print them to the internal printer.

Displays the software version, total tests from first use, and the serial number.

MAIN MENU (Screen 2)

Utilities, many of which customize your user interface in the tester.
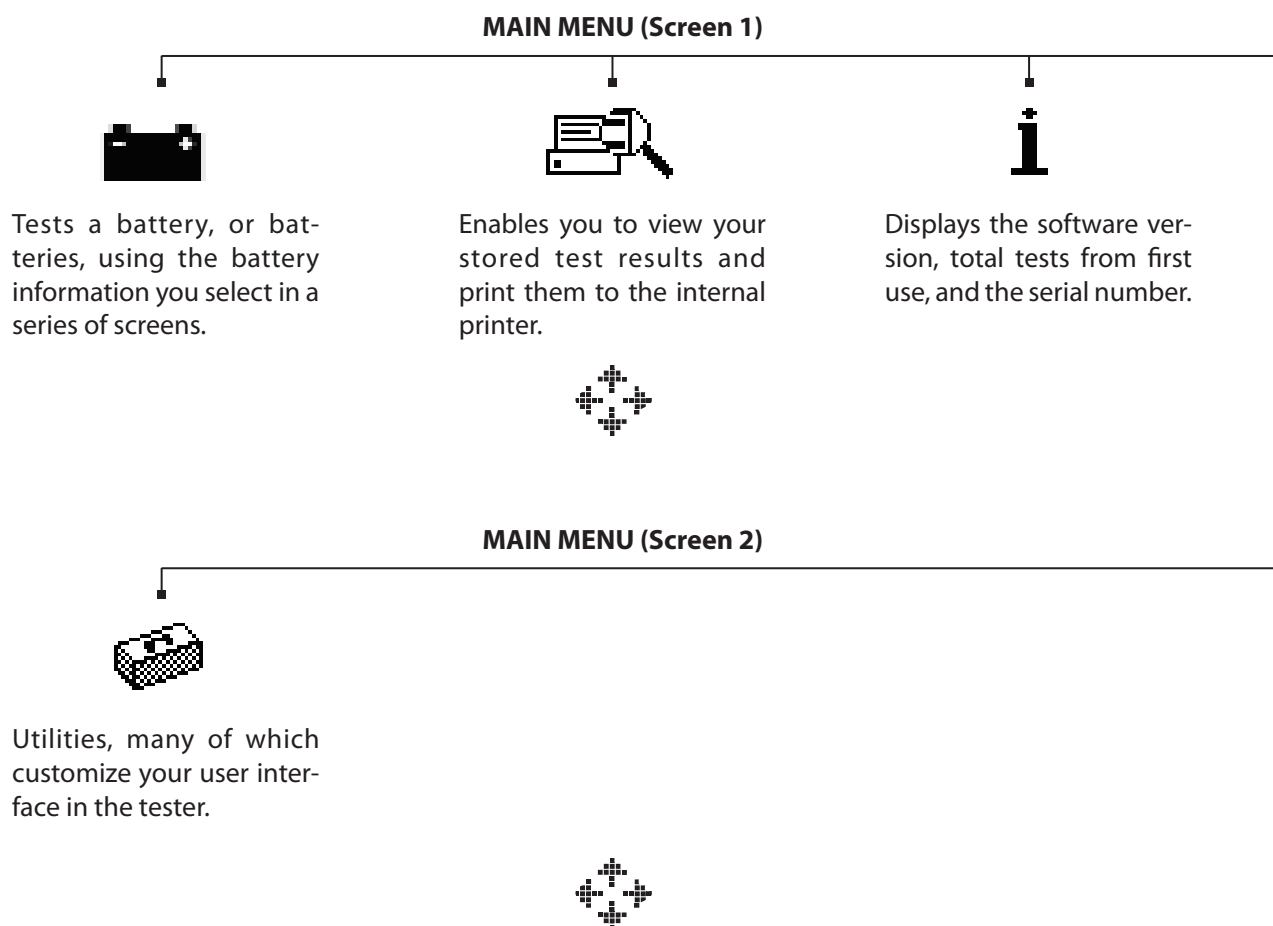
Print/View Menu

The tester stores the last test results in its memory until you perform another test. To review or print results before you retest, select a test type in the Print/View Menu.
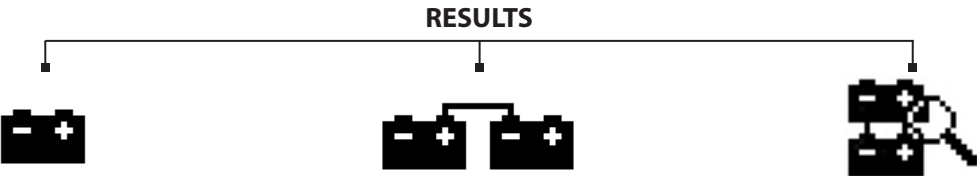
RESULTS

Displays the last test results per test type (single, series or pack). The results can be printed to the integrated printer.

BACK
to MAIN MENU

SELECT
an icon

Utility Menu

The Utility Menu lets you customize your analyzer to suit your needs.

SETUP (Screen 1)

Configur the tester by selecting several specific functions

Settings to adjust the screen contrast and back-light time.

Sets the language of the display and printouts.

BACK
to MAIN MENU

SELECT
an icon

SETUP (Screen 2)

Enables you to add a custom site to printed test results.

If you've created a note in the Edit Notes utility, use Print Notes to enable or disable the note(s) on the printout.

Enables you to create a note at the bottom of printed test results.

BACK
to MAIN MENU

SELECT
an icon

SETUP (Screen 3)

Formats the SD card to receive data. Also erases all data on the card.

Enable you to Update the software in the tester with a specific SD Card

BACK
to MAIN MENU

SELECT
an icon

Chapter 3: Test Preparation

Inspecting the Battery

Before starting the test visually inspect the battery for:

- Cracked, buckled, or leaking case. If you see any of these defects, replace the battery.

- Corroded, loose, or damaged cables and connections. Repair or replace them as needed.

- Corrosion on the battery terminals, and dirt or acid on the case top. Clean the case and terminals using a wire brush and a mixture of water and baking soda.

- When electrolyte level is too low, replace the battery.

Testing Out of Generator

The preferred battery test location is in the generator. However, if you plan to test out of the generator:

- Always disconnect the negative cable from the battery first and reconnect it last.

- Always use a carry tool or strap to lift and transport the battery.

Testing In Generator

The preferred test position is at the battery posts.

Connecting the Battery Test Cable

CAUTION: Do not connect the tester to a voltage source greater than 30 Vdc.

Connect the clamps to the battery: the red clamp to the positive (+) terminal and the black clamp to the negative (–) terminal. If you connect the clamps in the wrong polarity (positive to negative or negative to positive), the tester displays **CLAMPS REVERSED!** Reconnect the clamps correctly.

To make sure both sides of the clamps are gripping the terminals, rock the each clamp back and forth. A poor connection will prevent testing, and the tester will display the message **CHECK CONNECTION**. If the message reappears after you have correctly reconnected the clamps, clean the terminals and reconnect.

Setting User Preferences

Before starting your test you may want to customize the use of your analyzer by setting preferences in the Utility Menu. The menu has settings for the display's date and time, the contrast and backlight time, a utility to customize printouts, among others.

To conserve the analyzer's internal batteries, the tester will turn off after 10 minutes of inactivity.

Chapter 4: Battery Testing

The tester will guide you through the steps of selecting your battery test parameters and interpreting the results. Before you start the test, review the instructions in *Chapter 3: Test Preparation*.

New Battery Test

1. From the MAIN MENU choose BATTERY TEST.

2. Choose BATTERY TEST and you will see two options in BATTERY AGE:
   - IN SERVICE
     - OUT OF GENERATOR
     - IN GENERATOR
   - NEW BATTERY

   IN SERVICE means the battery has been in use. NEW BATTERY means the battery has never been in service (used) before. OUT OF GENERATOR means that the battery has been in use, but is not installed at that moment. IN GENERATOR means the battery is installed and so in service at the moment.

   NOTE: A new battery is always out of generator since it is never been used before!

   Please, choose NEW BATTERY.

3. Choose your BATTERY TYPE.

   First check the OPTIMA REDTOP battery rating. If the battery rating is 910 CCA/SAE, please select OPTIMA. If the OPTIMA REDTOP rating is other than 910 CCA/SAE, please select AGM SPIRAL, select the RATING UNITS and the BATTERY RATING.

4. Choose the RATING UNITS and BATTERY RATING, or the part number in case of 'JIS'. Please see appendix B at the back of the manual for an explanation of JIS.

5. Measure the temperature. Press NEXT to continue.
   (The temperature can influence the battery's capability to deliver energy.)

6. The test will be performed.

   The results will be shown. You can print the results by selecting PRINT. If END is pressed you will go back to the MAIN MENU.

For all the possible results please go to the 'Test Results' section, which can be found on page 20 of this manual.

①

MAIN MENU — BATTERY TEST — --.--V — SELECT

②

BATTERY AGE — ○IN SERVICE ◉NEW BATTERY — BACK — NEXT

③

BATTERY TYPE — ◉OPTIMA REDTOP ○FLOODED ○AGM FLAT ○AGM SPIRAL — BACK — NEXT

④

RATING UNITS — ◉CCA ○JIS ○DIN ○SAE ○IEC ○EN — BACK — NEXT
BATTERY RATING — 815 A(EN) — BACK — NEXT

⑤

TEMPERATURE — 20°C — AIM TEMP. SENSOR 5CM FROM BATTERY — BACK — NEXT

⑥

TESTING — TESTING AT: 815EN
RESULTS — CHARGE & RETEST — VOLTAGE: 10.96V — MEASURED: 28 A(EN) — RATED: 815 A(EN) — TEMPERATURE: 29°C — PRINT — END
RESULTS — TIME TO CHARGE — 285 MINUTES @ 25A — 142 MINUTES @ 50A — PRINT — END
RESULTS — SOC — 0% 25% 50% 75% 100% — PRINT — END
PRINTING — PRINTING... PLEASE WAIT — END

Out of Generator

1. From the MAIN MENU choose BATTERY TEST.

2. Choose BATTERY TEST and you will see two options in BATTERY AGE:
   - IN SERVICE
   - NEW BATTERY

   Please, choose IN SERVICE. In service means the battery has been in use, and when performing the OUT OF GENERATOR test, the battery is NOT installed in the generator.

3. Choose OUT OF GENERATOR

4. Choose your BATTERY TYPE.

   First check the OPTIMA REDTOP battery rating. If the battery rating is 910 CCA/SAE, please select OPTIMA. If the OPTIMA REDTOP rating is other than 910 CCA/SAE, please select AGM SPIRAL, select the RATING UNITS and the BATTERY RATING.
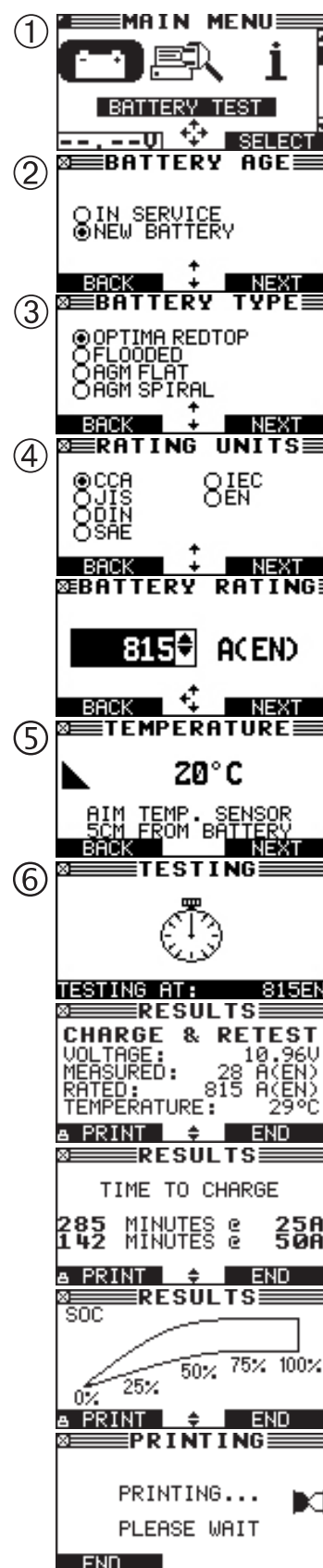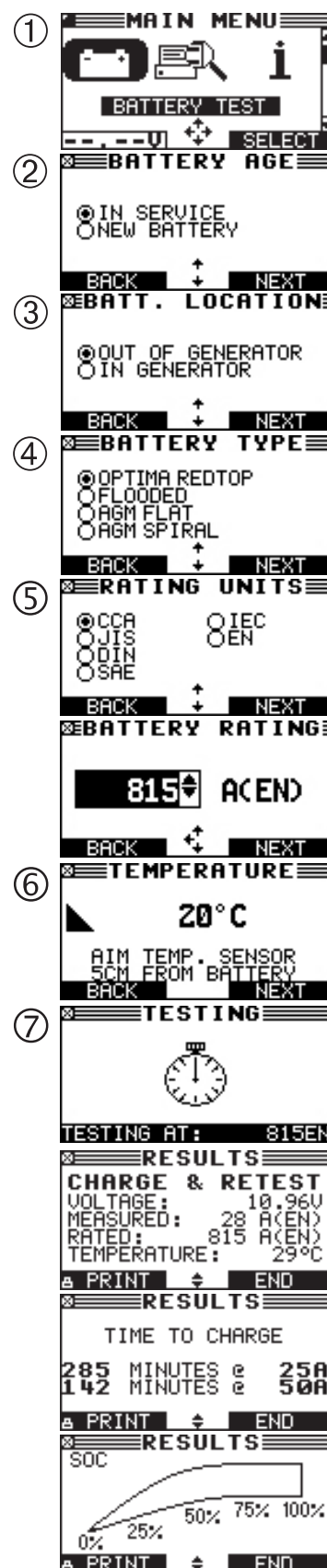
5. Choose the rating system and rating, or the part number in case of 'JIS'. Please see appendix B at the back of the manual for an explanation of JIS.

6. Measure the temperature. Press NEXT to continue.
   (The temperature can influence the battery's capability to deliver energy.)

7. The test will be performed.

   The results will be shown. When testing a single or series configuration the individual battery result is shown. Whereas for the parallel configuration you will see a pack result.

   The results will be shown. You can print the results by selecting PRINT. If END is pressed you will go back to the MAIN MENU.

For all the possible results please go to the 'Test Results' section, which can be found on page 20 of this manual.

① MAIN MENU / BATTERY TEST / --.--V / SELECT

② BATTERY AGE / ⦿IN SERVICE / ⦾NEW BATTERY / BACK / NEXT

③ BATT. LOCATION / ⦿OUT OF GENERATOR / ⦾IN GENERATOR / BACK / NEXT

④ BATTERY TYPE / ⦿OPTIMA REDTOP / ⦾FLOODED / ⦾AGM FLAT / ⦾AGM SPIRAL / BACK / NEXT

⑤ RATING UNITS / ⦿CCA ⦾IEC / ⦾JIS ⦾EN / ⦾DIN / ⦾SAE / BACK / NEXT
BATTERY RATING / 815 A(EN) / BACK / NEXT

⑥ TEMPERATURE / 20°C / AIM TEMP. SENSOR 5CM FROM BATTERY / BACK / NEXT

⑦ TESTING / TESTING AT: 815EN
RESULTS / CHARGE & RETEST / VOLTAGE: 10.96V / MEASURED: 28 A(EN) / RATED: 815 A(EN) / TEMPERATURE: 29°C / PRINT / END
RESULTS / TIME TO CHARGE / 285 MINUTES @ 25A / 142 MINUTES @ 50A / PRINT / END
RESULTS / SOC / 0% 25% 50% 75% 100% / PRINT / END

In Generator

1. From the MAIN MENU choose BATTERY TEST.

2. Choose BATTERY TEST and you will see two options in BATTERY AGE:
   - IN SERVICE
   - NEW BATTERY

   Please, choose IN SERVICE. In service means the battery is in use, and when performing the IN GENERATOR test, the battery is installed in the generator.

3. Please, choose IN GENERATOR.

   A warning is shown:

4. Choose your BATTERY CONFIGURATION. Please see appendix A at the back of the manual for various battery configurations.

   Make sure to choose the correct configuration, otherwise the test and its result can be inaccurate. When choosing a parallel configuration you will be asked to put in the number of batteries.

5. Choose your BATTERY TYPE. Press NEXT to continue.

   First check the OPTIMA REDTOP battery rating. If the battery rating is 910 CCA/SAE, please select OPTIMA. If the OPTIMA REDTOP rating is other than 910 CCA/SAE, please select AGM SPIRAL, select the RATING UNITS and the BATTERY RATING.

6. Choose the rating system and rating, or the part number in case of 'JIS'. Please see appendix B at the back of the manual for an explanation of JIS.

7. Measure the temperature. Press NEXT to continue.
   (The temperature can influence the battery's capability to deliver energy.)

8. The test will be performed.

   The results will be shown. When testing a single or series configuration the battery test result is shown. Whereas for the parallel configuration you will see a pack result. For all the possible results please go to the 'Test Results' section, which can be found on page 20 of this manual.

   On the next page you can see the testing process per column for configurations up to 6 batteries per pack.

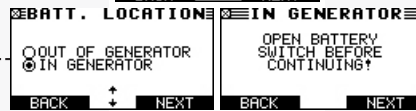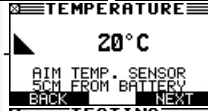*Please see next page for the screen flow of this test*

①

MAIN MENU
BATTERY TEST
--.--V SELECT

②

BATTERY AGE
⦿ IN SERVICE
○ NEW BATTERY
BACK NEXT

③

BATT. LOCATION
○ OUT OF GENERATOR
⦿ IN GENERATOR
BACK NEXT

IN GENERATOR
OPEN BATTERY
SWITCH BEFORE
CONTINUING!
BACK NEXT

④

BATT. CONFIG.
12V PARALLEL
BACK SELECT

⑤

BATT. IN PACK
ENTER NUMBER OF
BATTERIES IN PACK
2
BACK NEXT

BATT. IN PACK
ENTER NUMBER OF
BATTERIES IN PACK
3
BACK NEXT

BATT. IN PACK
ENTER NUMBER OF
BATTERIES IN PACK
4
BACK NEXT

BATT. IN PACK
ENTER NUMBER OF
BATTERIES IN PACK
5
BACK NEXT

BATT. IN PACK
ENTER NUMBER OF
BATTERIES IN PACK
6
BACK NEXT

BATTERY TYPE
⦿ OPTIMA RED TOP
○ FLOODED LEAD ACID
○ AGM FLAT
○ AGM SPIRAL
BACK NEXT

⑥

RATING UNITS
⦿ CCA   ○ IEC
○ JIS   ○ EN
○ DIN
○ SAE
BACK NEXT

BATTERY RATING
815 A(EN)
BACK NEXT

⑦

TEMPERATURE
20°C
AIM TEMP. SENSOR
5CM FROM BATTERY
BACK NEXT

⑧

TESTING
TESTING AT: 815EN

⑨

TESTING PACK
CONNECT TO
BATTERY 2 OF 2
END

PACK RESULTS
CHECK PACK
BATT# 1,2
VOLTAGE: 10.90V
RATED: 815 A(EN)
TEMPERATURE: 23°C
PRINT   END

PACK RESULTS
1 2 3 4 5 6
PRINT   END

TESTING PACK
CONNECT TO
BATTERY 2 OF 3
END

TESTING PACK
CONNECT TO
BATTERY 3 OF 3
END

PACK RESULTS
CHECK PACK
BATT# 1-3
VOLTAGE: 10.91V
RATED: 815 A(EN)
TEMPERATURE: 24°C
PRINT   END

PACK RESULTS
1 2 3 4 5 6
PRINT   END

TESTING PACK
CONNECT TO
BATTERY 2 OF 4
END

TESTING PACK
CONNECT TO
BATTERY 3 OF 4
END

TESTING PACK
CONNECT TO
BATTERY 4 OF 4
END

PACK RESULTS
CHECK PACK
BATT# 1-4
VOLTAGE: 10.90V
RATED: 815 A(EN)
TEMPERATURE: 24°C
PRINT   END

PACK RESULTS
1 2 3 4 5 6
PRINT   END

TESTING PACK
CONNECT TO
BATTERY 2 OF 5
END

TESTING PACK
CONNECT TO
BATTERY 3 OF 5
END

TESTING PACK
CONNECT TO
BATTERY 4 OF 5
END

TESTING PACK
CONNECT TO
BATTERY 5 OF 5
END

PACK RESULTS
CHECK PACK
BATT# 1-5
VOLTAGE: 10.91V
RATED: 815 A(EN)
TEMPERATURE: 24°C
PRINT   END

PACK RESULTS
1 2 3 4 5 6
PRINT   END

TESTING PACK
CONNECT TO
BATTERY 2 OF 6
END

TESTING PACK
CONNECT TO
BATTERY 3 OF 6
END

TESTING PACK
CONNECT TO
BATTERY 4 OF 6
END

TESTING PACK
CONNECT TO
BATTERY 5 OF 6
END

TESTING PACK
CONNECT TO
BATTERY 6 OF 6
END

PACK RESULTS
CHECK PACK
BATT# 1-6
VOLTAGE: 10.90V
RATED: 815 A(EN)
TEMPERATURE: 24°C
PRINT   END

PACK RESULTS
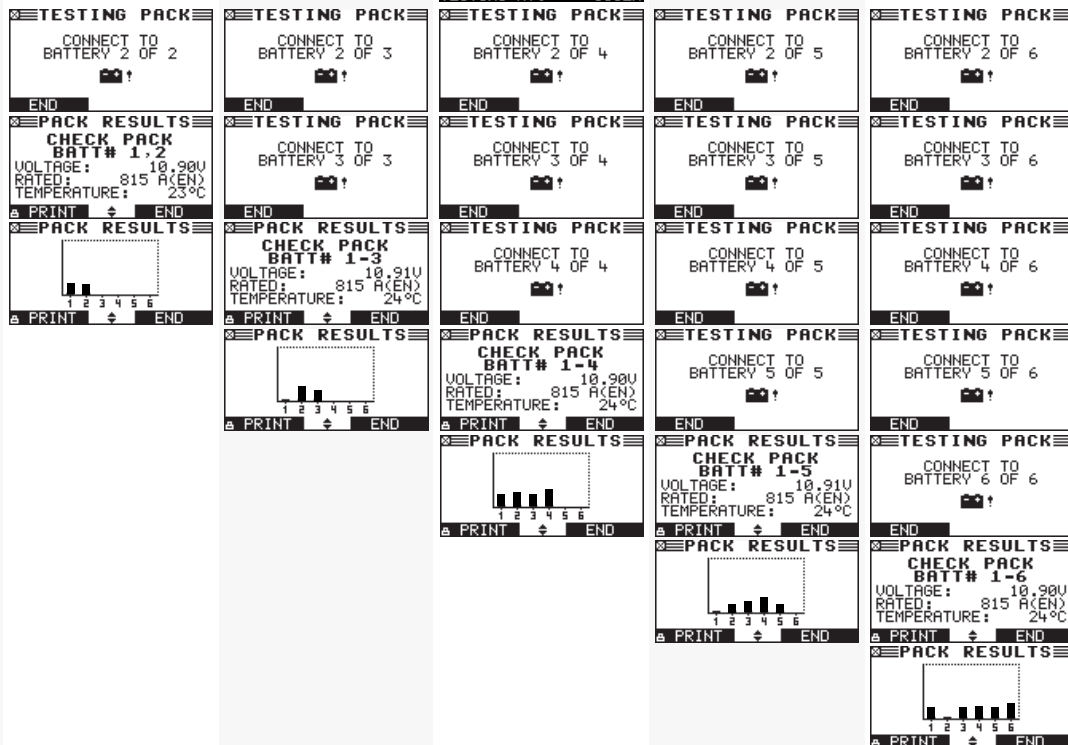1 2 3 4 5 6
PRINT   END

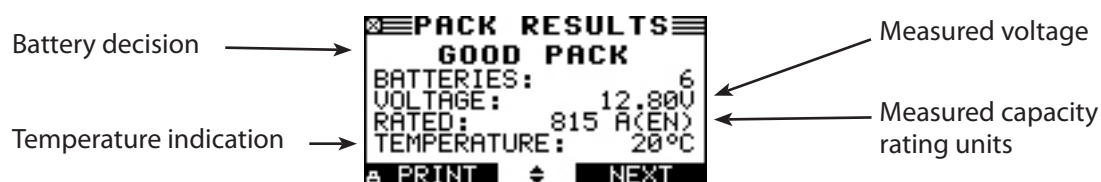## Additional tester messages

Deep Scan Test

In some cases the tester may need to further analyze the battery to determine whether the battery should be replaced or it has a significant chance to be recovered. It will then conduct a Deep Scan Test of the battery for a few seconds. This test will typically be performed on batteries that are in a low state of charge.

Open Battery Switch Before Continuing

Before testing the batteries the battery switch must be opened. Therefore a warning pops up. If the switch is closed during the test, the test can be disrupted. If a system test is required, the tester will ask you to close the switch.

Battery Test Results

After the test the tester will display the battery decisions with the complete results in a series of screens. Use the **UP/DOWN ARROW** keys to scroll through each result. To print the results press the **PRINT** soft key. To return to the MAIN MENU, press the **END** soft key.

Battery decision →

Temperature indication →

```
⊠≣PACK RESULTS≣
   GOOD PACK
BATTERIES:        6
VOLTAGE:      12.80V
RATED:      815 A(EN)
TEMPERATURE:    20°C
⌂ PRINT    ⬍    NEXT
```

← Measured voltage

← Measured capacity rating units

Battery decisions and recommendations

Decision	Recommended Action and Information
GOOD BATTERY	Return the battery to service
GOOD-RECHARGE	Fully charge the battery and return it to service.
CHARGE & RETEST	Fully charge the battery and retest. Failure to fully charge the battery before retesting may cause inaccurate results. If CHARGE & RETEST appears again after you fully charge the battery, replace the battery.
REPLACE BATTERY	Replace the battery and retest. A REPLACE BATTERY result may also mean a poor connection between the battery cables and the battery. After disconnecting the battery cables, retest the battery using the OUT OF GENERATOR test before replacing it.
BAD CELL-REPLACE	Replace the battery and retest.
FROZEN BATTERY	Defrost the battery and retest.
24 VOLT SYSTEM	24-volt system detected. Connect to 12V battery instead of the system.
LOW VOLT REPLACE	Battery voltage is too low.
SYSTEM NOISE	If the result system noise keeps occurring, disconnect the batteries and test each battery individually. System noise possibly means the generator is interfering with the batteries. Therefore, an accurate test is impossible.

New Battery Test Result

Decision	Recommended Action and Information
GOOD BATTERY	Return the battery to service
BATTERY APPROVED	Fully charge the battery prior to placing into service.
REST & RETEST	Battery could have a surface charge, because it has recently been charged.
CHARGE & RETEST	Fully charge the battery and retest. Failure to fully charge the battery before retesting may cause inaccurate results. If CHARGE & RETEST appears again after you fully charge the battery, replace the battery.
REPLACE BATTERY	Replace the battery and retest. A REPLACE BATTERY result may also mean a poor connection between the battery cables and the battery. After disconnecting the battery cables, retest the battery using the OUT OF GENERATOR test before replacing it.
BAD CELL-REPLACE	Replace the battery and retest.
FROZEN BATTERY	Defrost the battery and retest.
24 VOLT SYSTEM	24-volt system detected. Connect to 12V battery instead of the system.
LOW VOLT REPLACE	Battery voltage is too low.

Pair Test Result

Decision	Recommended Action and Information
GOOD PAIR	Return the pair to service
CHARGE PAIR	Fully charge the pair and return it to service.
REPLACE PAIR	Replace the pair. A REPLACE PAIR result may also mean a poor connection between the battery cables and the battery. After taking the battery out, retest the battery using the OUT OF GENERATOR test before replacing it.
OUT OF BALANCE	The batteries used in the pack do not have the same state of charge and/or the same state of health. This means the batteries are not in balance and this can result in a non properly functioning battery pair. Follow the tester's instructions.

Pack Test Result

Decision	Recommended Action and Information
GOOD PACK	Return the pack to service
CHECK PACK	Follow the tester's advise and check the battery indicated. Disconnect the battery and perform a single battery test.
CHARGE PACK	Disconnect the batteries and charge them individually according to the test result.

Chapter 5: Utilities

From the MAIN MENU select the Utility Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. From the Utility Menu select CONFIG TESTER. The Utility Menu allows you to easily set up your battery tester:

Config Tester

TIME :	**15:23**
MODE :	24 HOUR
DATE :	01/02/2013
FORMAT :	DD/MM/YYYY
TEMP. UNITS	C

Time

1. Use the **LEFT/RIGHT ARROWS** to highlight the hour, minutes. Use the **UP/DOWN ARROWS** to adjust the hours, minutes. To rapidly scroll, hold down an **ARROW** key.

<p align="center">9 : 19 PM</p>

2. Press the **SAVE** soft key to save your setting or **BACK** to return to the ADJUST screen.

Mode

Use the **LEFT/RIGHT ARROWS** to select the option of your choice.

1. Select the 24-hour or AM/PM mode

2. Press the **OK** soft key to save your setting

Date

Date cannot be changed. The date configuration is embedded in the software.

Format

Use the **LEFT/RIGHT ARROWS** to select the desired option.

1. MM/DD/YYYY (month/day/year) or DD/MM/YYYY (day/month/year)

2. Press the **OK** soft key to save your setting.

Temp. units

1. Use the **LEFT/RIGHT ARROWS** to select either Celsius or Fahrenheit as temperature indication.

Display

From the MAIN MENU select the Utility Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. From the Utility Menu select DISPLAY. The LCD OPTIONS utility enables you to adjust the contrast of the text on the display and the backlight time.

Contrast Level

The contrast level is 0 (lightest) to 10 (darkest). To change it:

1. Press the **UP** or **DOWN ARROW** to highlight the option.

CONTRAST LEVEL	10
BACKLIGHT TIME	**60**

2. Press the **LEFT/RIGHT ARROW** key to display the option's numerical scroll box.

10 ◆ (1-10)

3. Press the **UP/DOWN ARROW** keys to select your preference.

4. Press the **SAVE** soft key to save your setting or the **BACK** soft key to return to the CONTRAST LEVEL screen without saving the changes.

Backlight Time

Backlight time is from 0 to 60 seconds. To change it:

1. Press the **UP** or **DOWN ARROW** to highlight the option.

CONTRAST LEVEL	10
BACKLIGHT TIME	**60**

2. Press the **LEFT/RIGHT ARROW** key to display the option's numerical scroll box.

60 ◆ SEC

3. Press the **UP/DOWN ARROW** keys to select your preference.

4. Press the **SAVE** soft key to save your setting or the **BACK** soft key to return to the BACKLIGHT screen without saving the changes.

Language

From the MAIN MENU select the Utility Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. From the Utility Menu select LANGUAGE. The LANGUAGE utility enables you to select a language for the display and printouts. To set your preference:

1. Use the **UP/DOWN ARROWS** to move the dot to the option button of your choice. There is a selection of 24 languages.

2. Press the **NEXT** soft key to save your setting.

Site Info

From the MAIN MENU select the Utility Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. From the Utility Menu select SITE INFO. The SITE INFO utility enables you to create a header for your printed test results showing your business location information. Its two information screens contain eight lines of text with up to 16 characters on each line.

Screen 1

1–SITE NAME —
2–ADDRESS 1
3–ADDRESS 2
4–ADDRESS 3

To create or overwrite a header:

1. Press the **UP** or **DOWN ARROW** to highlight the line you want to change.

2. Press SELECT to activate the line for editing, move the cursor backward to erase a character, press the **LEFT ARROW** key; to move the cursor forward, press the **RIGHT ARROW** key.

3. Insert a character by pressing **UP** or **DOWN ARROW** associated with the character as many times as needed.

4. Press the **RIGHT ARROW** key to save the character.

5. You can center text by selecting blank spaces before and after lines of text or insert spaces between words.

6. Press the **SAVE** soft key to save your setting or the **BACK** soft key to return to the SHOP INFO screen without saving the changes.

Print Notes

From the MAIN MENU select the Utility Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. From the Utility Menu select PRINT NOTES. The PRINT NOTES select utility enables and disables the printing of the custom notes you have created in the EDIT NOTES utility.

1. Use the **UP/DOWN ARROWS** to move the dot to the option button of your choice.

2. Press the **NEXT** soft key to save your setting or the **BACK** soft key to return to the PRINT NOTES select screen without saving the changes.

Edit Notes

From the MAIN MENU select the Utility Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. From the Utility Menu select EDIT NOTES. The EDIT NOTES utility enables you to create a note that prints at the bottom of every test result. Its two information screens contain eight lines of text with up to 16 characters each. The editing process is the same as when you create a header for your test results printouts. See the SITE INFO utility for more information.

Format Card

From the MAIN MENU select the Utility Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. From the Utility Menu select FORMAT CARD. Select this utility to format a data card to receive data or erase all data on the card. The Tester will warn you before formatting the card and ask you if you want to continue. When a new blank data card is used you always have to use this function before the tester can write to the card.

Clear Counters

From the MAIN MENU select the Utility Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. From the Utility Menu select CLEAR COUNTERS. This utility can be used to clear the counters of the tester and reset all decision totals.

Update

From the MAIN MENU select the Utility Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. From the Utility Menu select UPDATE. As software updates become available you'll be able to use this utility to update the Tester software using files on an SD card. The use of a special formatted card is required for this action.

FIRMWARE (use this option when new software becomes available from Franklin Electric)

SAVE CONFIG (the tester will store the workshop address to the data card, file name is CONFIG.CSV)

LOAD CONFIG (after new software is uploaded you can reload the workshop details to the tester)

1. Connect the tester to a 12V battery to ensure the tester does not switch off during the proces
2. Insert the disc in the tester (as shown on page 8)
3. Select one of the options and follow the instructions on the screen
4. When finished the tester will prompt you to remove the card and reboot the tester

Chapter 6: Print/View

From the MAIN MENU select the Print/View Menu using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys. The Print/View Menu enables you to view and print the results of the tests performed before you perform another test and overwrite the results in memory.

Print/View allows you view and print all available test results. To return to the MAIN MENU, press the **END** key. To print the results press the **PRINT** key.

The results can be viewed per test type. You can view only the last test result, one per test type:

•   BATTERY RESULTS

•   PAIR RESULTS

•   PACK RESULTS

Chapter 7: Version Info

From the MAIN MENU select Version Info using the **UP**, **DOWN**, **LEFT** and **RIGHT ARROW** keys.

Version info displays the software version, the database version, the total tests performed and the serial number. The utility keeps a permanent count of the number of battery tests performed since the analyzer was first used. Please note that whenever you load new firmware the counter will be reset.

Chapter 8: Troubleshooting

If you have problems with the display or printer try these troubleshooting suggestions:

Problems with the Display

The display does not turn on:

- Check the connection to the battery.
- The analyzer's internal batteries may need to be replaced.

The display flickers or is dim:

- The contrast may need to be adjusted in the Utility menu.
- The analyzer's internal batteries may need to be replaced.
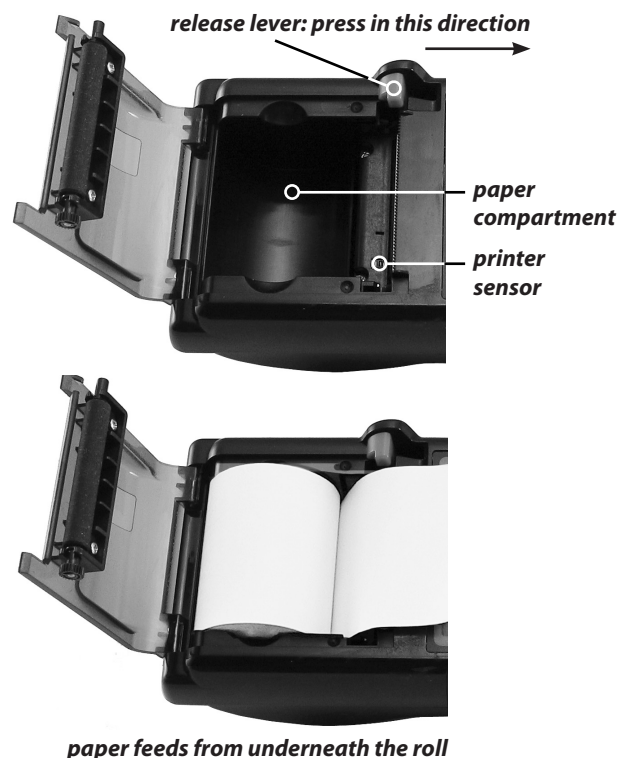
Data will not print

The internal printer will not print
- The analyzer must be connected to the generator battery to print to the internal printer
- The generator battery may be too low to power the printer (battery with at least 11.5 volts)
- Verify that the paper is properly installed
- Verify that the paper sensor is clean and undamaged

Changing the Printer Paper

The IR printer only uses thermal paper in a roll with the dimensions 2.25 in x 85 ft (57 mm x 25.9 m). You can purchase replacement rolls at most office supply stores.

To replace the paper roll:

1. Unlock the printer door by gently pressing on the red lever. Remove the spent roll.

2. Place a new roll of paper in the compartment, and pull the paper forward so that it extends past the serrated edge of the paper slot.

3. Close the door and make sure the lever locks securely.

release lever: press in this direction

paper compartment

printer sensor

paper feeds from underneath the roll

Chapter 9: Tester Internal Batteries

The Tester uses 6 AA, 1.5-volt batteries (alkaline recommended) to allow testing of batteries down to 1 volt and supply power while the menu is active. The analyzer can test batteries down to 5.5 volts when the internal batteries are not functioning.

Battery Power Indicator

The square in the upper left corner of the display indicates the charge level of the battery pack. The square is black when the battery pack is fully charged. It gradually changes to white as the charge level declines. The Tester will display a warning message when the batteries need replacing.
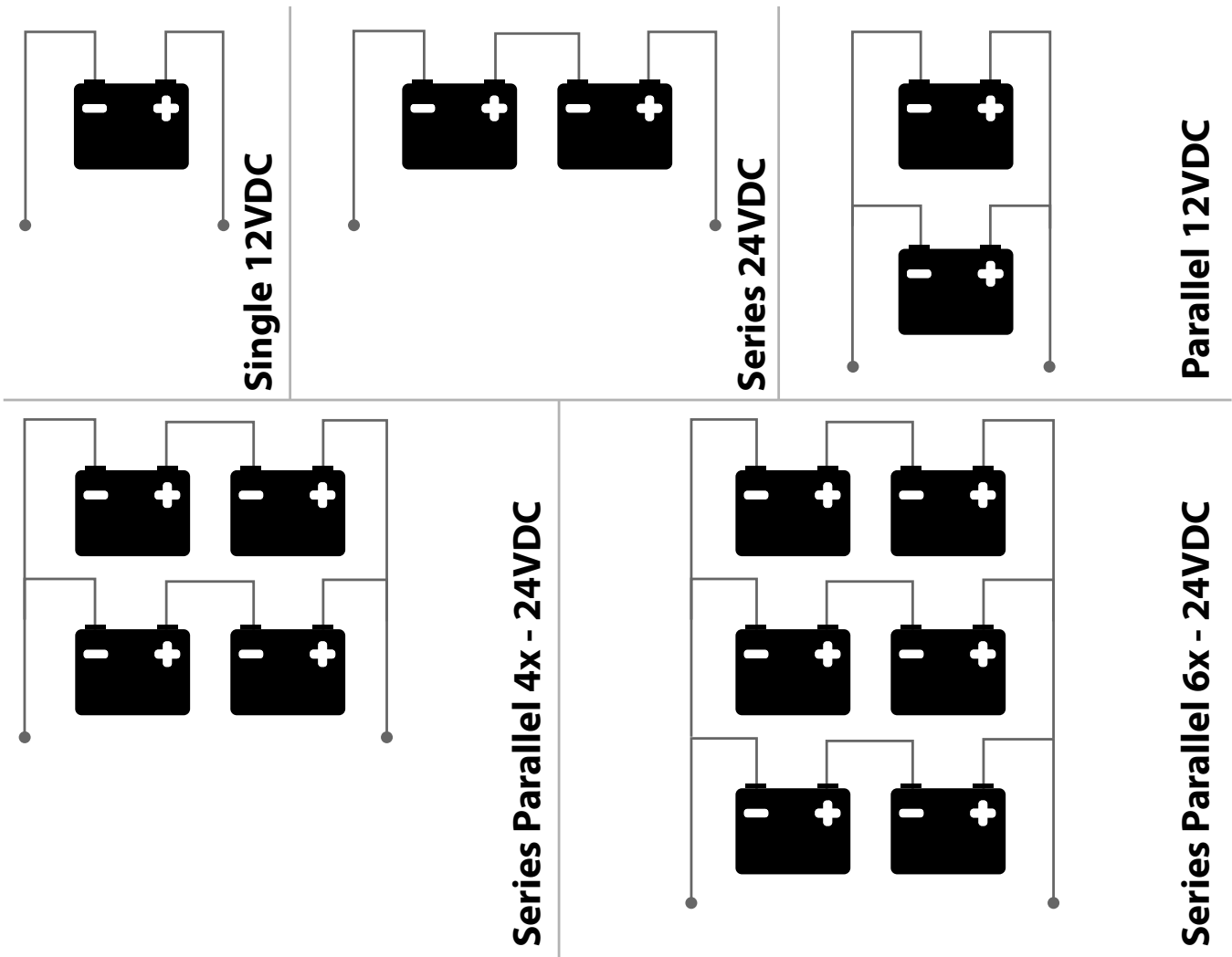

Full   **Decreasing**   **Low**   **Powered by test battery**
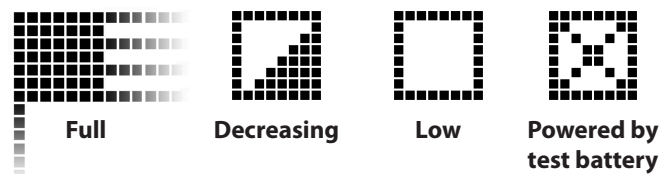
Power Level Indicator for AA Batteries

Replacing the Tester Batteries

1. Turn the Tester face down.

2. Use a Philips screwdriver to remove the screw securing the door to the battery compartment.

3. Lift the door at the tab and place it aside.

4. Remove the discharged batteries.

5. Insert new batteries as shown, make sure the positive and negative terminals are positioned correctly.

6. Reposition the door on the battery compartment.

7. Reinsert and tighten the screw.

APPENDIX A: Battery Configurations

Single 12VDC

Series 24VDC

Parallel 12VDC

Series Parallel 4x - 24VDC

Series Parallel 6x - 24VDC

APPENDIX B: Explanation JIS

JIS

JIS stands for Japanese Industrial Standard. These batteries do not show any values on the label, but a code. This code, mentioned on the label, is linked to values which are programmed into the tester. By choosing the correct code, the tester will test the battery against the correct values.

Patents

The CTS-655P is made by Midtronics, Inc., and is protected by one or more U.S. and foreign patents. For specific patent information, contact Midtronics, Inc. at +1 630 323-2800.

Limited Warranty

This analyzer is warranted to be free of defects in materials and workmanship for a period of two years from date of purchase. Midtronics will, at our option, repair or replace the unit with a remanufactured unit. This limited warranty applies only to the analyzer, and does not cover any other equipment, static damage, water damage, overvoltage damage, dropping the unit, or damage resulting from extraneous causes including owner misuse. Midtronics is not liable for any incidental or consequential damages for breach of this warranty. The warranty is void if owner attempts to disassemble the unit or to modify the cable assembly.