# **CDS**<sup>®</sup> COMPUTE-A-CHARGE® **CC220EW**

Enhanced, Wireless Refrigerant Charging Scale





CPS Link<sup>™</sup>







# **OWNER'S MANUAL** (English)

Latest updates: www.cpsproducts.com

TO BE OPERATED BY QUALIFIED PERSONNEL ONLY

Patented CDS Link Wireless Technology Bluetooth FC (CES-003 Patent #9.043.161

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Please read, follow and understand the contents of this entire manual, with special attention given to **Danger**, **Warning** and **Caution** statements.

#### FOR USE BY PROFESSIONALLY TRAINED AND CERTIFIED OPERATORS ONLY. MOST STATES, COUNTRIES, ETC., MAY REQUIRE USER TO BE LICENSED. PLEASE CHECK WITH YOUR LOCAL GOVERNMENT AGENCY.

- **DANGER:** Overfilling a recovery tank may cause a violent rupture resulting in severe injury or even death. As a minimum, please use a scale to continuously monitor recovery tank weight.
- **WARNING:** All hoses may contain liquid refrigerant under pressure. Contact with refrigerant may cause frostbite or other related injuries. Wear proper personal protective equipment such as safety goggles and gloves. When disconnecting any hose, please use extreme caution as high pressure refrigerant may be present.
- **WARNING:** Avoid breathing refrigerant vapors and lubricant vapor or mist. Breathing high concentration levels may cause heart arrhythmia, loss of consciousness, or even cause suffocation. Exposure may irritate eyes, nose, throat and skin. Please read manufacturer's Material Safety Data Sheet for further safety information on refrigerants and lubricants.
- WARNING: Make certain all safety devices are functioning properly before operating equipment.
- **CAUTION:** To avoid cross contamination of refrigerant and potential leakage to the atmosphere, proper hoses and fittings should be used and checked for damage.
- **CAUTION:** To avoid overfilling refrigerant tank, read and follow manufacturer's recommended filling instructions for refrigerant being recovered and constantly monitor the scale display.
- **CAUTION:** Mixing of different refrigerants will cause your recovered supply of refrigerant to become contaminated.
- **CAUTION:** The user must monitor the scale display and turn ON/OFF manifold and/or tank valves at appropriate times so that the proper amount of refrigerant is recovered (into the tank) or removed (from the tank)









The Compute-A-Charge CC220EW is a battery operated, precision scale for weighing, charging and recovering refrigerants used in HVAC/R systems. This scale may be operated in a MANUAL or PROGRAMMABLE mode (or AUTOMATIC -if paired with the SVW Wireless Solenoid Valve-purchased separately).

For additional functionality, the CC220EW can be paired to a mobile device running the CPS Link app which allows technicians to conveniently store and access Job and Customer Data. Logs (records) of refrigerant use (Tank Tracker) can also be stored and sent to the home office or others.

# **KEY FEATURES**

- Weight Capacity 220 lb (100 kg)
- Weight Accuracy 0.015% of reading [or +/- selected display resolution, whichever greater]
- Display Resolution (Selectable) User can select from 4 different increments (see specifications)
- Various Modes Of Operation- Run in Manual or Programmable Mode (or pair to the CPS Wireless Solenoid Valves for Automatic operation)
- Continuous Battery Life One 9V = 50 hours; Two 9V (included) = 100 hours
- 7 Button Keypad Easy to navigate
- Audible & Visual Charge / Recover Alarms Alerts when approaching *programmed charge* amount or *overfill limit*
- Auto-Power Off (APO) To conserve battery power, and when not in use, the scale can be set to turn OFF after any of 5 different time increments (see specifications)
- Smart Awake Feature Displays weight at time of Auto-Off

# ADDITIONAL FEATURES IF PAIRED TO A MOBILE DEVICE

- · Key controlling functions and readouts conveniently located on your mobile device
- Store Job Data- Work order, invoice number, customer, log of refrigerant use
- · Create And Store Customer Data- Name, address, e-mail, phone, notes
- · Test Logs- Measurements, results of tests associated with services performed
- · Export- E-mail specific files to customer or home office
- Tank Tracker<sup>™</sup> -Convenient refrigerant tank management system for tracking refrigerant used on jobsites (for Supply & Recovery tanks and refrigerant type in each tank), plus time, date and geotag location where used
- Operates in ISM band for international use

# LCD DISPLAY FUNCTIONS



**Display Screen On Corded Control** 

# ABBREVIATIONS THAT APPEAR ON CORDED CONTROL DISPLAY

Selectable Modes	<b>SCL=</b> Scale (Weigh)		<b>rEC =</b> Recover	<b>rES =</b> Resolution	<b>APO =</b> Automatic Power OFF	<b>SOL =</b> Solenoid (SVW- Purchased Separately)
Charge Mode	<b>c</b> = Charge (tracking) in process	<b>F</b> = Final programmed charge achieved				
Recover Mode	t OFF: Ensure tank NOT on scale	<b>t ON:</b> Place tank ON scale	■ = Recovery (tracking) in process	<b>o =</b> Tank overfilled	<b>n</b> = Net gain of one or more tanks	
Charge or Recover	<b>h</b> = Hold (pause) refrigerant tracking <b>Err</b> = Scale Malfunction					
All Modes <b>OL=</b> Overload (Reduce load immediately)						

# **7 BUTTON KEYPAD (FUNCTIONS)**



Maximum Load:	220 lb (100 kg)
Weight Accuracy:	0.015% of reading or +/- selected resolution, whichever greater
Display Resolution (Increments):	Selectable: 0.1 oz ( 2 g); 0.2 oz (5 g); 0.25 oz (10 g); or 0.50 (25 g)
Battery Life:	One 9V = 50 hrs.; Two 9V = 100 hrs.
Power Source:	One or two (included) 9V Alkaline batteries.
Battery Status Indicator:	3 segment symbol
Control Type:	Handheld LCD display (or wirelessly using CPS Link app and mobile device)
Control Mount:	Magnetic back, with 360° swivel hook
Cord:	6' (1.8 m) flexcord, extended
Auto Power Off (Enabled):	Default = Display Turns OFF After 10 minutes inactivity (Can re-set in increments of 5, 10, 15, 30, 60 mins or OFF)
Auto Power Off (Disabled):	Display shows "APO OFF" at power up [Display will be constant ON]
Smart Awake:	Displays last weight measurement at time of Auto-off, updated to current value
Weight Readout:	lb. / oz. or kg / g
Operating Temperature Range:	14°F to 122°F (-10°C to 50°C)
Scale to mobile device range:	150 ft. (45.7 m) Unobstructed
Operating Humidity Range:	0 to 95% non-condensing
Overload Protection:	Mechanical and visual
Unit Weight (Including Case):	5.62 lb (2.55 kg)
Platform Dimensions:	8.75" x 8.75" (22.3 x 22.3 cm)
Calibration:	National Institute of Standards & Technology (U.S.)
Approvals	FCC, IC, CE
Serial # / Radio I.D. #	See label on scale underside
Warranty:	1 year

# QUICK START INSTRUCTIONS (Scale)

- A. Remove scale from storage case and place on level, rigid surface.
- B. Install one or two (included) 9V batteries in back of control.
- C. If desired, attach swivel hook to rear of control housing.
- D. Press power () to turn scale ON.
- E. APO (Automatic Power Off). 5 minutes = default setting [you may also select 10, 15, 30, 60 mins, or turn APO OFF]. Press see until APO appears on display. Then use  $\frown$   $\frown$  until desired  $\overrightarrow{APO}$  time is found. Then press for select desired time.
- F. DISPLAY RESOLUTION: Default setting is 0.2 Oz (5g).
  - a. To select a different resolution, press SET/RESET until "rES" appears on display.
  - b. Press Up/Down arrows until new desired value found (0z: .1, .2, .25, .50; or Grams: 2, 5, 10, 25)
  - c. Press SET/RESET to select value.
- G. WEIGHT UNITS: To select Imperial (Lb & Oz) or Metric (Kg & G) units, press the LB/KB key to toggle to your desired value.
- H. You are now ready to use the Weigh, Charge or Recover functions.

# **MANUAL WEIGH (Scale)**

- 1. Place refrigerant tank on scale
- 2. Default mode is "SCL" (weigh).
- 3. View GROSS weight on display.
- 4. Remove tank from platform after weight observed.
- 5. Display will flash if maximum weight capacity (220 Lb/100 kg) exceeded.

# **PROGRAMMABLE CHARGE (Scale)**

- 1. Place refrigerant tank on scale
- 2. Connect equipment per DIAGRAM A (CHARGE).
- 3. Press set to scroll through the menu and choose CHARGE "CH9".
- 4. Use to input desired weight (charge amount), then press Hold .(Figure C-4)
- 5. Once tank and manifold valves are opened, the charge (tracking) session will begin. The display will show a small "c"indicating "charge" and how much refrigerant has been charged into your system (removed from the refrigerant tank).
- 6. During charging, screen characters will eventually flash at an increasing rate, showing that the programmed charge amount is closer to being reached.
  - HOLD Pressing HOLD while charging will PAUSE charge tracking, allowing the user tighten hoses, change tanks if necessary, but continue later without losing track of the NET amount charged.
  - SET/RESET Pressing set during charge operation will stop/cancel the charge from being tracked. The normal WEIGH Mode will resume.

DIAGRAM A (CHARGE)





Fia. C-4 (Example Weight Shown)

Runs on one 9V battery (or 2 included)

360° Swivel hook with magnetic back

C











- NOTE: So that the *actual charged* vs. tracked amounts align, remember to physically stop charging by closing tank and/or manifold valves before pressing HOLD.
- GO/HOLD After any adjustments are made, the accumulated amount being tracked can be resumed by pressing Houp
- When programmed charge amount (weight) has been reached, the screen will flash a large "F" (FINAL) (Figure C-7) and the control will "beep". Quickly close tank and/or manifold valves.
- 8. Press set to end session.
- 9. SHUT DOWN When CHARGE function done, turn off recovery machine, close valves, remove cylinder from platform. Press 🕐 to turn scale OFF.

# PROGRAMMABLE RECOVER (Scale)

- 1. Connect equipment per DIAGRAM B (RECOVER) but *DO NOT PLACE TANK ON SCALE AT THIS TIME*
- 2. Press to scroll through menu and choose Recover "rEC".
- 3. For tank you will use, press to input a combined Tank Weight & Water Capacity Weight both stamped individually on the tank collar (but use TW + 0.8 X WC for final value to enter), then press
  - WC = Water Capacity (weight);
  - TW = Tank Weight (of empty tank)

#### 4. TANK OFF

When "t OFF" appears (See Figure R-6) ensure tank is NOT on scale, press FIGUR.

#### <u>CAUTION: DO NOT PLACE TANK ON PLATFORM BEFORE STEP 5. DOING</u> <u>SO COULD LEAD TO OVERFILLING THE REFRIGERANT TANK. DANGER -</u> <u>THE RECOVERY TANK CONTAINS LIQUID REFRIGERANT. OVERFILLING</u> <u>OF THE RECOVERY TANK MAY CAUSE A VIOLENT EXPLOSION RESULTING</u> <u>IN SEVERE INJURY OR EVEN DEATH.</u>

#### 5. TANK ON

When "t ON" (Figure R-7) appears, place tank on scale, press and valves and turn ON Recovery Machine (follow manufacturer's instructions) to start recovery.

#### 6. REMAINING CAPACITY OF TANK

Display will show "r" (Figure R-8) indicating recovery in process, alongside the remaining tank refrigerant weight capacity (until full). Display will count backwards from remaining tank capacity (indicating decreasing capacity of tank) CAUTION: OVERFILLING RECOVERY TANK MAY RESULT IN SERIOUS INJURY



Fig. C-7 (Example Weight Shown)



#### DIAGRAM B (RECOVER)





Fig. R-6



Fig. R-7



Fig. R-8 (Example Weight Shown)

#### 7. TANK FILL LIMIT REACHED (OR EXCEEDED)

While recovering refrigerant, be ready to turn OFF recovery\_ machine and/or CLOSE valves, while constantly monitoring the display so that the tank will NOT be overfilled. Characters will flash if tank overfill has occurred and a "negative" symbol will appear next to the "o" symbol, (Figure R-9) indicating the tank has been overfilled by the amount indicated on the display.

7.1 If characters flash, the user may press and once to stop the flashing. Turn OFF recovery machine and/or CLOSE valves. The user may change tanks then press again to restart recovery tracking.

#### 8. HOLD FUNCTION

At any point during recovery, pressing for will activate the HOLD function. During HOLD indicated by "h" (Figure R-10), the remaining tank capacity will update if the weight is changed, but the net gain will not account for any additional recovery during hold.

NOTE: Remember to physically stop recovering refrigerant by\_ closing tank and/or manifold valves while activating HOLD.

#### 9. NET GAIN

At any point during refrigerant recovery, pressing and holding will show the net gain indicated by "n" (Figure R-11) The recovery feature will track the net gain during the recovery session (except during Hold), including even after overfill is reached, so that the exact total net gain will be known.

#### 10. IF RECOVERING REFRIGERANT INTO MORE THAN ONE TANK

If recovering refrigerant into more than one tank, of the same capacity, without reaching overfill, press during recovery, turn off recovery machine and close valves. Then change the tank, then press during again to restart recovery tracking.

11. **SHUT DOWN** - When RECOVER function complete, close valves, turn OFF recovery machine (follow manufacturer's instructions) and remove tank from scale then press to end session or pres 🕑 until display turns off.

# QUICK START INSTRUCTIONS (Scale + CPS Link App)

- 1. Review and adhere to all safety instructions.
- 2. Remove scale from case and place on a level, rigid surface.



For iOS devices - Download the free CPS Link<sup>™</sup> app from the App Store.

CPS Link™ Download App Now

For Android devices (version 4.3 or higher) -Download the free CPS Link<sup>™</sup> app from *Google Play.* Note: Earlier versions of Android software do not use 'low energy' communication device necessary to install and run the app.

Fig. R-10 (Example Weight Shown)



Fig. R-11 (Example Weight Shown)





(Example Weight Shown)



<sup>10.1</sup> The NET Gain will continue to track the recovery of this session, until 📰 is pressed.



- 3. Remove battery door on back of hand control and install 1 or 2 (included) 9V batteries.
- 4. Replace battery door.
- 5. Press (b) to turn scale ON.
- 6. Scan the appropriate QR code from this front cover or download and install the free CPS Link<sup>™</sup> app on your moble device
- 7. On your mobile device, open the CPS Link app. Select DEVICE LIST screen (above) which will show and scan for CPS wireless devices in range.
- 8. If there are multiple CPS wireless scales in range, select ONE (see label on scale base for serial/ radio I.D. number) device from the screen on your mobile device.
- 9. Connect equipment as shown in Diagram A or Diagram B. If you don't intend to use the Tank Tracker<sup>™</sup> (tank management feature), you are ready to use the Compute-A-Charge scale. To use Tank Tracker<sup>™</sup>, see page 16-17 for more information.
- 10. You are now ready to work.

## HOSE & EQUIPMENT CONNECTION DIAGRAMS



#### **DIAGRAM B (RECOVER)**



#### **DIAGRAM A (CHARGE)**

(III)

The **HOME SCREEN** (below) appears if the CPS Link<sup>TM</sup> app is paired to a scale you have selected from the device list (page 10).



# SETTINGS SCREEN (Using CPS Link App On Mobile Device)





# **TOOLS SCREEN (Using CPS Link App On Mobile Device)**



(ps





# Follow on screen instructions









CLOSE manifold valves after programmed charge completed



Final tank weight (once CHARGE completed)



Exit app when done

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Note: 1. Not all screens in the CHARGE sequence are shown above. 2. This operation can also be performed using the scale with corded control/ display. See page 6. 3. If mobile device loses connection with CC220EW, charge numerical information can still be viewed on the scale's corded control (See page 6).





desired amount

recovered

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# TANK TRACKER™ (Featured Within The CPS Link App)

The Tank Tracker<sup>™</sup> feature (Patent Pending), developed by CPS Products, Inc., provides a convenient way to manage and track your inventory of refrigerant supply and recovery tanks in the field.

Tank Tracker<sup>TM</sup> is included within the CPS Link app (U.S. Patent # 9,043,061), and it allows technicians to set up an electronic inventory of all their Suppy and Recovery Tanks. Information such as tank size, type and amount of refrigerant contained in each can be entered.

Tank Tracker<sup>™</sup> will then record the addition or subtraction of refrigerant from a tank, along with the date, place and time the tank was used, as well as the name of the job and the customer it was used for. All of this information can be mailed to clients, technicians, a home office, or others.

The Tank Tracker<sup>™</sup> feature is available only when the CPS Link app has been activated and the CC220EW scale has been paired with a mobile device.





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Follow on screen instructions to use Tank Tracker





Enter SUPPLY TANK information (or select from drop downs)



# Follow on screen instructions to use Tank Tracker



Enter RECOVERY TANK information (or select from drop downs)





## Follow on screen instructions





Place known SUPPLY TANK on scale and select its description



#### Note:

1. Not all screens in the CHARGE sequence are shown above. 2. If mobile device loses connection with CC220EW, charge numerical information can still be viewed on the scale's corded control (See page 6).



**OPEN** manifold valves



Final, updated tank weight (example) shown. Close valves.





## Follow on screen instructions





Place known RECOVERY TANK on scale and select its description









**CLOSE** manifold valves

1 \$53 99 Proper Recovery Tank \$53 montene 4 ... 6.2 .. \* tenare 18 .... 10 ...

8

	 1.8.	
-		
01/10 (210a)		
-		

#### Note:

1. Not all screens in the RECOVER sequence are shown above. 2. If mobile device loses connection with CC220EW, recover numerical information can still be viewed on the scale's corded control (See page 7-8).

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- **A.** Pair the CC220EW scale to the CPS Wireless Solenoid Valve ("SVW"-purchased separately). Refrigerant tank weights are then read on the hand control display, or;
- **B.** Pair the CC220EW scale to the SVW (purchased separately) and a mobile device. Tank weights are read on the hand control display or mobile device simultaneously.

**Charge:** In AUTOMATIC mode, the scale will monitor a tank's weight and communicate with the SVW to automatically open/close for precise metering of a refrigerant charge that is programmed by a technician.

**Recover:** A CC220EW working in conjunction with an SVW can also be used to shut off a recovery procedure when accurate tank weight/capacity information has been inputed by the technician beforehand.

# Note: In both charge and recovery procedures, technicians must still turn manifold and/or tank valves On/Off at the very beginning or very end of a charge or recover procedure.

See the SVW Solenoid Valve Owner's Manual for further information about its use and operation.

# APPENDIX A (SCALE BATTERY LEVEL, CONNECTIVITY)

#### Scale Battery Level:

When the scale and mobile device wirelessly connect, the scale's battery usage is displayed as segments on the hand held LCD display (See Appendix B below), or the app HOME screen as a "% voltage remaining" graphic.

#### When To Replace Scale Batteries:

CPS recommends installing new 9V batteries if the battery reading falls below 7%, although useful operation can be obtained with battery voltages as low as 3%.

#### Low Battery Indication:

When a low battery condition exists, the scale will turn itself off in a safe condition.

#### Scale/Mobile Device Connection:

If the CC220EW has difficulty maintaining connectivity, no response to entries, etc., the most probable cause is a low battery, or your mobile device may be more than 150 ft. (45.7 m) [direct line of sight] from the scale.

# APPENDIX B ( LCD BATTERY LEVEL INDICATOR)

The battery indicator is shown on the LCD display as a battery shape with a 3 segment icon:

(3) segments on bar graph: Battery level higher than 66%

(2) segments on bar graph: Battery level between 33% to 66%

(1) segments on bar graph: Battery level between 10% to 33%

(0) segments on bar graph: Battery level between 3% to 10%

(0) segments on bar graph, blinking: Battery level below 3%

LO CELL displayed on LCD: Battery depleted, powering down

EN 61326:2013	Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements
214 EN 55011	Industrial, Scientific & Medical, Class A Emissions Testing
303 EN 61000-4-2	Electrostatic Discharge, Immunity Testing
304 EN 61000-4-3	Radiated Electromagnetic Fields, Immunity Testing

# **APPENDIX D (CERTIFICATE OF CALIBRATION COMPLIANCE)**

The CC220EW scale has been calibrated to respond to the published minimum accuracy levels using one of the following NIST traceable standards:

- Class F 50 lb weight S/N's TP3060, 7816, 0J0H
- Class F 100 lb weight S/N's 2390, 1QNZ

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules and Industry Canada ICES-003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAN ICES-3 (A)/NMB-3(A)

## WARRANTY

CPS Products, Inc. guarantees that all products are free of manufacturing and material defects to the original owner for one year from the date of purchase. If the equipment should fail during the guarantee period it will be repaired or replaced (at our option) at no charge. This guarantee does not apply to equipment that has been altered, misused or solely in need of field service maintenance. All repaired equipment will carry an independent 90 day warranty. This repair policy does not include equipment that is determined to be beyond economical repair.

## **CPS LOCATIONS**

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