# SERVICE MANUAL

## Koldfront Through the Wall Air Conditioner

MODELS COVERED:

WTC8001W

WTC12001W

WTC8002WCO

WTC10002WCO115V

WTC10012WCO230V

WTC12002WCO115V

WTC12012WCO230V

WTC14012WCO230V

CAUTION: READ ALL SAFETY PRECAUTIONS IN THIS MANUAL BEFORE SERVICING THE UNIT
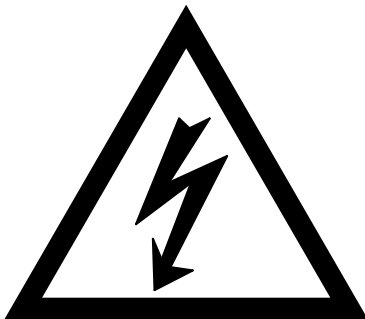
# CONTENTS

# SAFETY PRECAUTIONS

**WARNING: This manual and the information contained herein is intended for use by certified technicians. The manufacturer or seller is not responsible for the interpretation or misuse of the information provided, nor does it assume any liability in connection with its use.**

**The safeguards and warnings indicated in this manual do not cover all possible conditions which may occur. Common sense, caution, and care must be exercised.**

- To prevent electric shock, always unplug an appliance from the power supply before attempting any service.
- Disconnect the power cord by grasping the plug, not the cord.
- Do not bypass, cut, or remove the grounding plug.
- Prevent water from spilling onto electric elements or the machine parts.
- Always refer to the rating label on the appliance for rated current and voltage.
- Always check line voltage and amperage.
- Always use exact replacement parts.
- Any attempt to repair a major appliance may result in personal injury and property damage.

## Electrical Safety

- Do not exceed the power outlet ratings.
- It is recommended that the unit be connected to its own circuit.
- A standard electrical supply that is properly grounded in accordance with the National Electrical Code and all state and local codes and ordinances is required.
- Do not use outlets that can be turned off by a switch or pull chain.
- Always turn the unit off and unplug it from the outlet when cleaning.
- Unplug the unit if it is not going to be used for an extended period of time.
- Do not operate the unit with a power plug missing the ground plug, a damaged cord, or a loose socket.
- Be sure the appliance is properly grounded.
- Do not bypass, cut, or remove the grounding plug.
- If the power cord is damaged, it must be replaced by the manufacturer or a qualified technician.
- Do not use extension cords or power strips with this unit. You may need to contact an electrician if it is necessary to use a longer cord or if you do not have a properly grounded outlet. Do not modify the power cord's length or share the outlet with other appliances.
- Do not start or stop the unit by switching the electrical circuit's power on and off.
- Immediately unplug the unit if it makes strange sounds, emits an odor or smoke and contact customer service.
- Do not remove any part of the casing unless instructed by an authorized technician.
- Before the appliance is removed from service or discarded, remove any doors and cut off the power cord.

## ! WARNING

### Electrical Shock Hazard

Connect to a grounded 3 prong outlet with an individual 12 amp branch circuit protected by a 12 amp circuit breaker.
Connect to individual branch circuit.
Do not remove ground prong.
Do not use an adapter.
Do not use an extension cord.
Failure to follow these instructions can result in electrical shock, fire, or death.

## General Safety

- Always unplug an appliance from the power supply before attempting any service. Disconnect the power cord by grasping the plug, not the cord.
- Do not allow children or pets to play on or in the appliance.
- This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the machine by a person responsible for their safety.
- Do not install or store this appliance where it will be exposed to the weather.
- Disconnect from the power socket before cleaning or maintenance.
- If the plug (power cord) is damaged, it must be replaced by the manufacturer or an authorized service representative.
- This machine shall be repaired only by an authorized service representative. Only genuine replacement parts should be used.
- If connected to a circuit protected by fuses, use time-delay fuses with this appliance.
- Do not lean items against the glass door.
- Please do not close the door with excessive force. If it is found difficult to close the door, please check for obstruction.
- When you plan to dispose of this unit in the future, please comply with the local waste disposal regulations. Remove any doors so that children and pets will not be trapped in the unit.

# 1 Exploded Diagrams and Part Lists
## 1.1 WTC8001W and WTC12001W
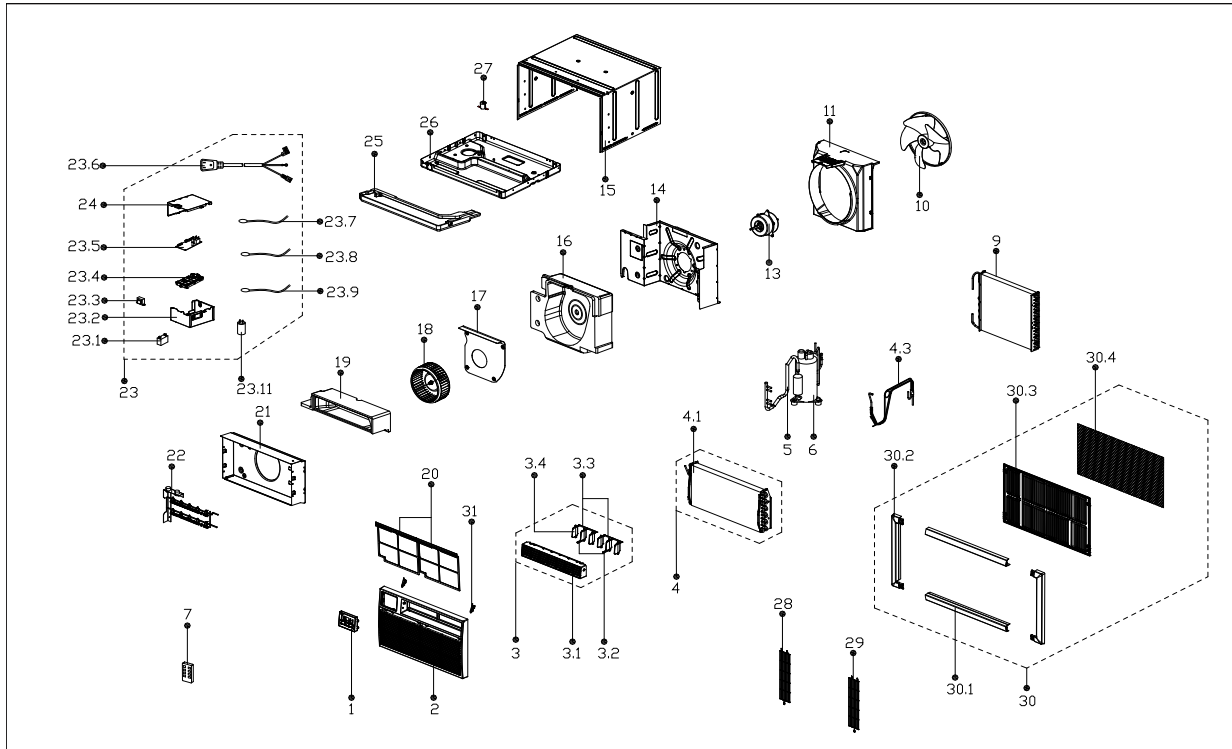
| No. | Part Name | No. | Part Name |
|---|---|---|---|
| 1 | Display assembly | 22 | Electric heater |
| 2 | Front panel | 23 | Electronic control box assembly |
| 3 | Air outlet assembly | 23.1 | Capacitor for fan motor |
| 3.1 | Air outlet | 23.2 | Electronic control box |
| 3.2 | Horizontal louver | 23.3 | Transformer |
| 3.3 | Connecting rod for louver | 23.4 | Bracket for main control board |
| 3.4 | Horizontal louver | 23.5 | Main control board assembly |
| 4 | Evaporator coil assembly | 23.6 | Power cord |
| 4.1 | Evaporator | 23.7 | Defrost sensor assembly |
| 4.3 | Capillary tube assembly | 23.8 | Ambient temperature sensor assembly |
| 5 | Discharge pipe assembly | 23.9 | Heater temperature sensor assembly |
| 6 | Compressor | 23.11 | Capacitor for compressor |
| 7 | Remote control | 24 | Cover for electronic control box |
| 9 | Condenser | 25 | Condenser water tray |
| 10 | Axial flow fan | 26 | Chassis assembly |
| 11 | Rear separating housing | 27 | Drain valve |
| 13 | Fan motor | 28 | Grille |
| 14 | Front separating housing | 29 | Grille |
| 15 | Cabinet | 30 | Installation accessories |
| 16 | Rear volute shell | 30.1 | Upper and lower shutter frame |
| 17 | Heat insulation | 30.2 | Left and right shutter frame |
| 18 | Centrifugal fan | 30.3 | Rear grille |
| 19 | Front volute shell | 30.4 | Plastic net |
| 20 | Air filter | 31 | Filter guide |
| 21 | Box for electric heater | | |

## 1.2 WTC WCO Models
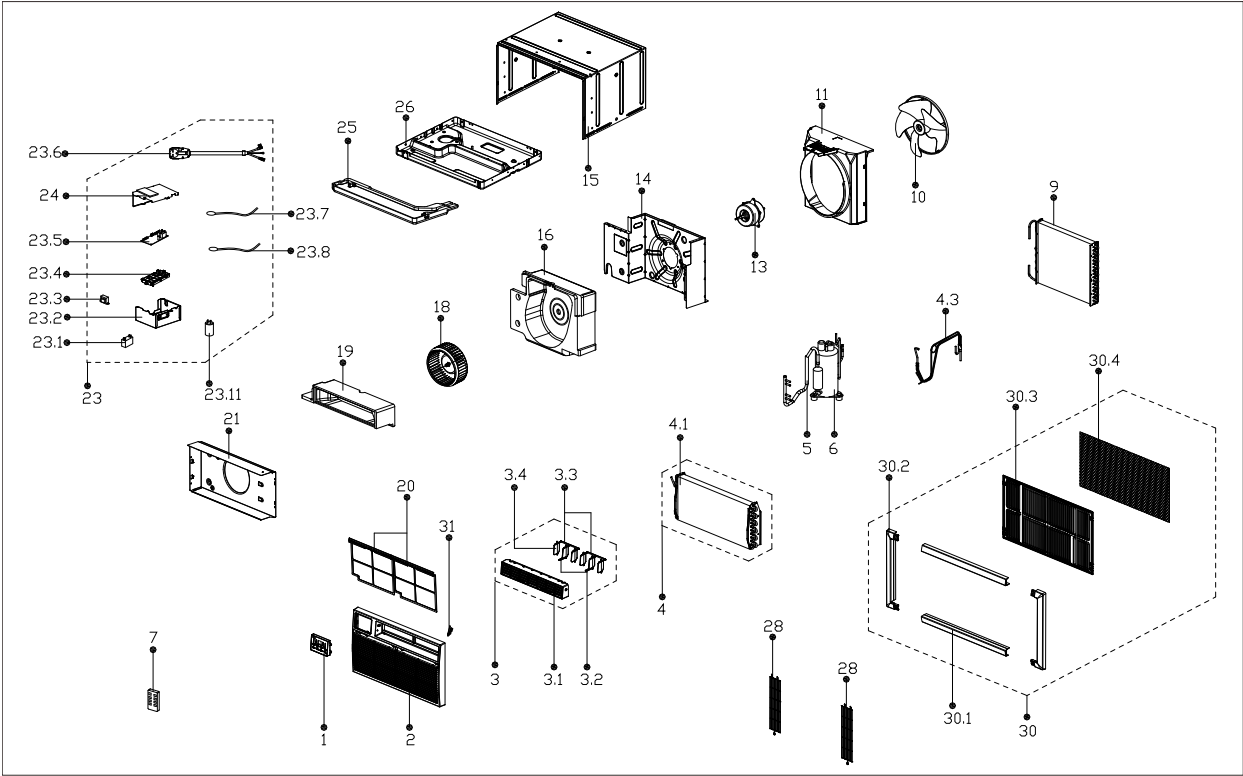
| No. | Part Name | No. | Part Name |
|---|---|---|---|
| 1 | Display assembly | 21 | Electrical heating box (for units with heat) |
| 2 | Front panel | 23 | Electronic control box assembly |
| 3 | Air outlet assembly | 23.1 | Capacitor |
| 3.1 | Air outlet | 23.2 | Electrical control box |
| 3.2 | Horizontal louver | 23.3 | Transformer |
| 3.3 | Connecting rod for louver | 23.4 | Mounting rack for main control panel |
| 3.4 | Horizontal louver | 23.5 | Main control board |
| 4 | Evaporator assembly | 23.6 | Power supply cord |
| 4.1 | Evaporator | 23.7 | Defrost temperature sensor |
| 4.3 | Capillary tube assembly | 23.8 | Room temperature sensor |
| 5 | Compressor exhaust pipe assembly | 23.11 | Compressor capacitor |
| 6 | Compressor | 24 | Electrical control box cover |
| 7 | Remote control | 25 | Water receiver tray |
| 9 | Condenser | 26 | Chassis assembly |
| 10 | Axial fan | 28 | Rear grill |
| 11 | Rear barrier assembly | 28 | Rear grill |
| 13 | Fan motor | 30 | Installation accessories |
| 14 | Front barrier assembly | 30.1 | Upper and lower shutter frame |
| 15 | Cabinet | 30.2 | Left and right shutter frame |
| 16 | Rear air duct foam | 30.3 | Air inlet grille |
| 18 | Centrifugal fan | 30.4 | Plastic Rear Guard |
| 19 | Front air duct foam | 31 | Filter guide |
| 20 | Air filter | | |

## 1.3 Dimensions
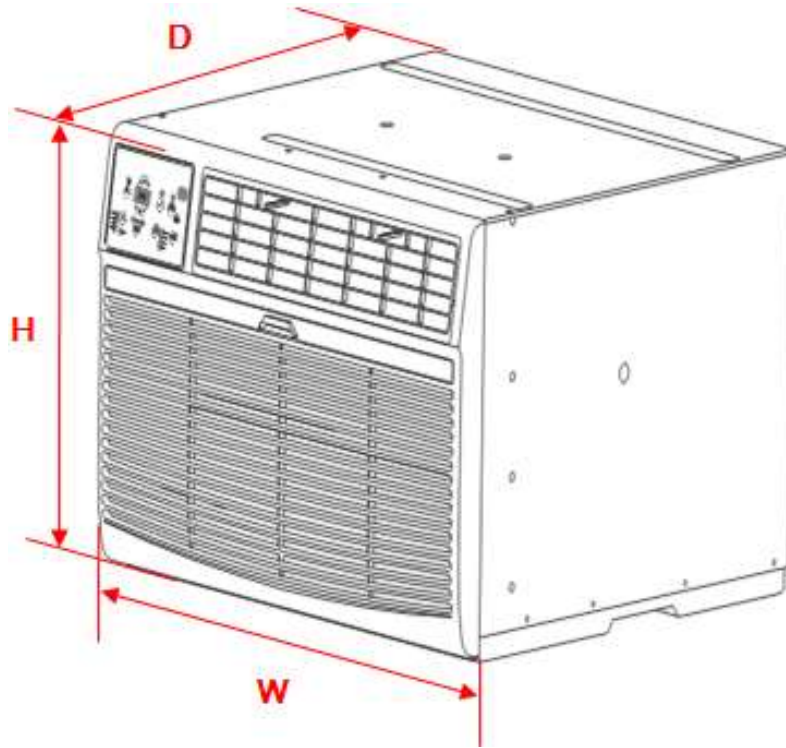
WTC Wall Unit

Wall Sleeve
Model: WTCSLV

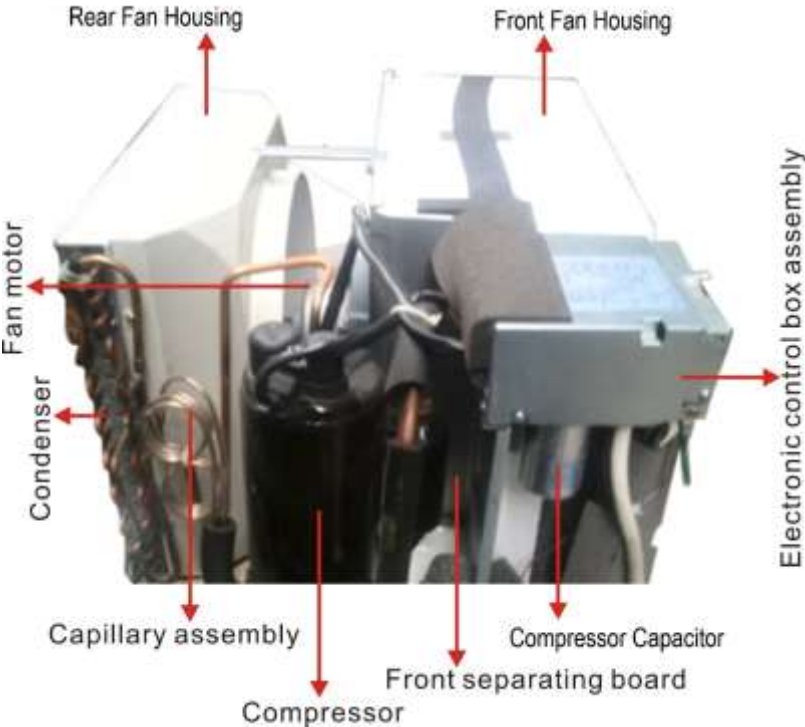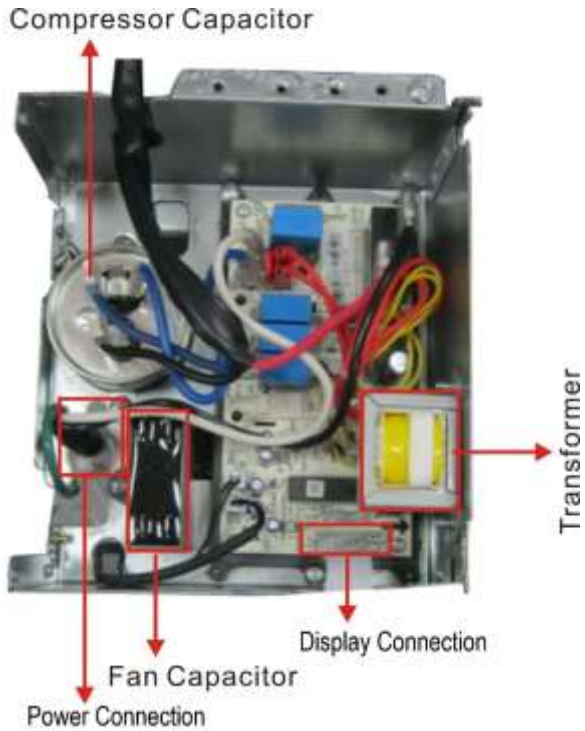|            | **Width**          | **Height**          | **Depth**           |
|------------|--------------------|---------------------|---------------------|
| WTC UNIT   | 24-1/4" (615 mm)   | 14-1/2" (369 mm)    | 20-1/4" (515 mm)    |
| WTC SLEEVE | 25-5/8" (649 mm)   | 15-1/4" (388 mm)    | 17-1/2" (445 mm)    |

# 2 Wiring Diagram (All Models)
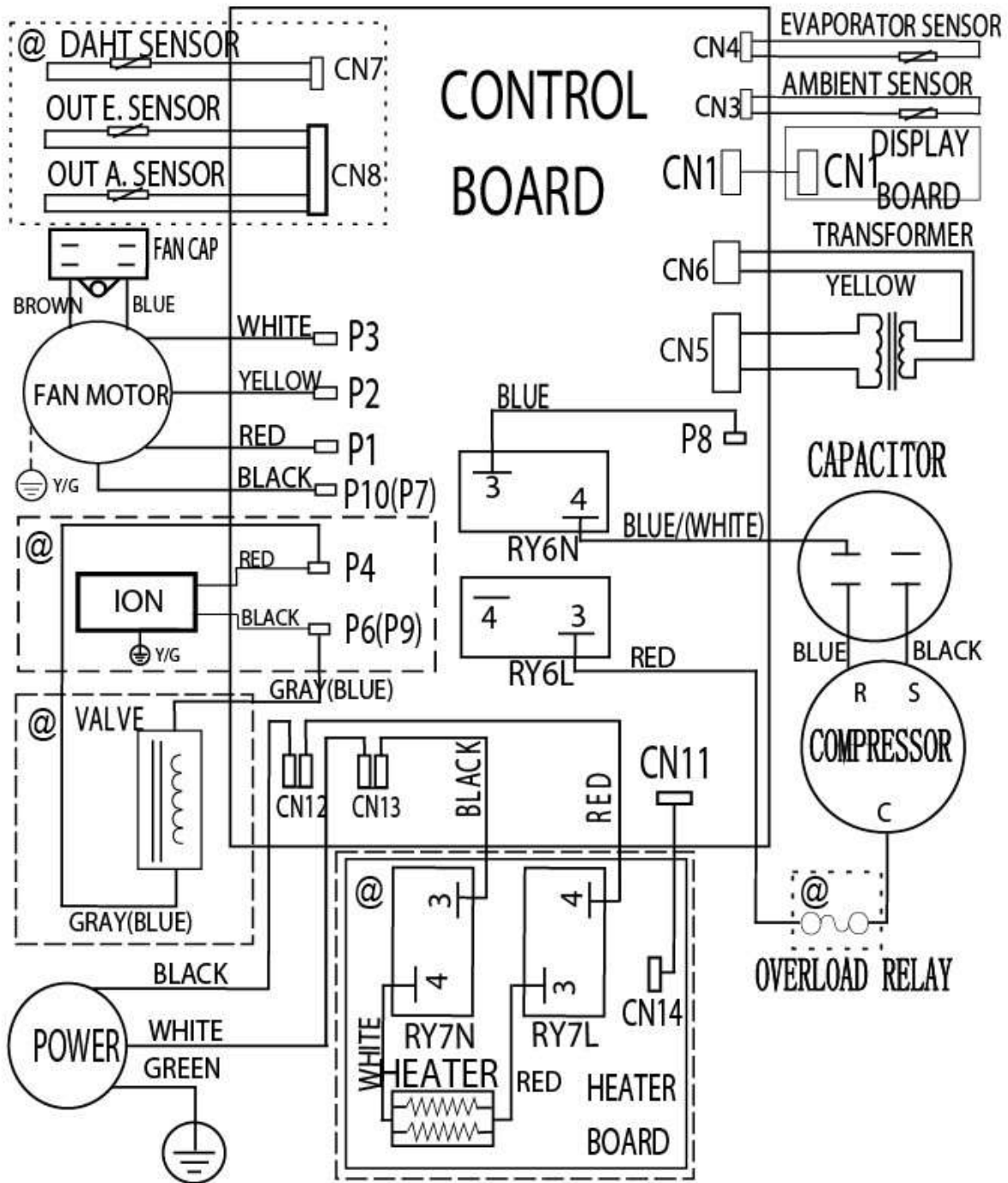


@ indicates optional components that are not included in all models.

# 3 Main Components

## 3.1 Major Parts



Rear Fan Housing
Front Fan Housing
Fan motor
Condenser
Electronic control box assembly
Capillary assembly
Compressor Capacitor
Front separating board
Compressor

## 3.2 Electronic Control Box and Main PCB



Compressor Capacitor
Transformer
Display Connection
Fan Capacitor
Power Connection

# 4 Unit Operation

## 4.1 Display Panel Controls
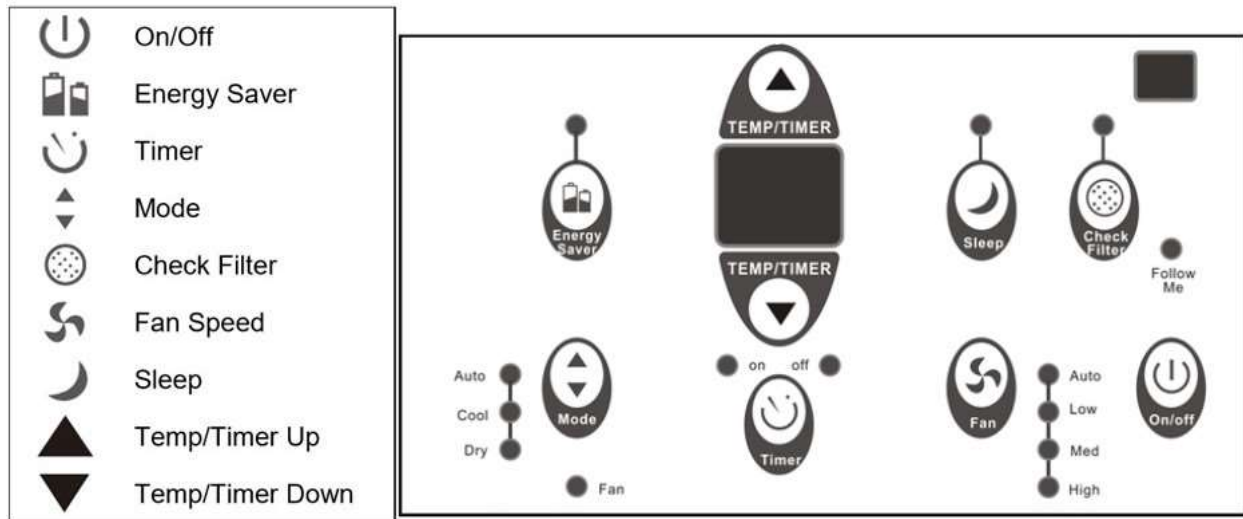


**On-Off Button**

Press ⏻ to turn on or off the unit.

NOTE: The Energy Saver feature will automatically turn on in Cool, Dry, and Auto mode.

**Up and Down Button**

Press or hold either Up ▲ or Down ▼ button until desired temperature is seen on the digital display. This temperature will be automatically maintained anywhere between 62 °F (17° C) and 86° F (30° C). Pressing and holding both Up and Down buttons for 3 seconds, will change the display from °F to °C.

**Mode select Button**

To choose the operating mode press Mode ▲▼ . Each time you press the button a mode is selected in a sequence that goes from Auto, Cool, Dry, to Fan. The indicator light beside the mode button will be illuminated and remain on once the mode is selected.

NOTE: The unit will automatically turn on the Energy Saver function under Cool, Dry, and Auto.

**Fan speed Button**

To select the speed of the fan press Fan Speed ⤺ which cycles through four steps- Auto, Low, Medium, or High. Each time the button is pressed the fan speed mode is shifted.

NOTE: The fan speed is automatically set to low and cannot be adjusted in Dry mode.

**Energy Saver Button**

To start the Energy Saver feature, press the Energy Saver ▮▮button. This feature is available on Cool, Dry, and Auto. The fan continues to run for 3 minutes after the compressor shuts off.  The fan then cycles on for 2 minutes at 10 minute intervals until the room temperature is above the set temperature, at which point the compressor turns back on and cooling starts.

**Timer Button**

➢ When the unit is on or off, press the Timer ⟳button and the "Timer On" indicator light illuminates.  It indicates that the Auto Start/Stop program is initiated.

➢ To switch to off press the Timer ⟳ button again and the "Timer Off" indicator light illuminates.  It indicates that the Auto Stop program is initiated.

➢ Press or hold the Up ▲or Down ▼ button to change the Auto Time by ½ hour increments up to 10 hours or 1 hour increments up to 24 hours. The control will count down the time remaining until start.

➢ The selected time will display for five (5) seconds and then will automatically revert back to display the previous temperature setting or room temperature when the unit is on.

➢ Turning the unit ON or OFF at any time or adjusting the timer setting to 0.0 will cancel the Auto Start/Stop program.

➢ The timer is not a permanent setting.  The user must set the timer each they wish to use it.

**Sleep Button**

To initiate, press the Sleep ☾ button. In this mode the selected temperature will increase by 2°F (1°C) 30 minutes after the mode is selected. The temperature will then increase by another 2°F (1°C) after an additional 30 minutes. This new temperature will be maintained for 6 hours before it returns to the originally selected temperature. This ends the Sleep mode and the unit will continue to operate as originally programmed. The Sleep Mode program can be cancelled at any time during operation by again pressing the Sleep button.

**Check Filter Button**

This feature is a reminder to clean the Air Filter for more efficient operation.  The LED light will illuminate after 250 hours of operation.  To reset after cleaning the filter, simply press the Check Filter ⊙ button and the light will go off.

## 4.2 Remote Control

ON/OFF button- Select to turn unit off and on.

MODE Button- Press this button to select desired operation mode from AUTO, COOL, DRY, and FAN.

TEMP DOWN button- Push this button to decrease the temperature setting in 1°C / 1°F increments to 17°C / 62°F.

TEMP UP button- Push this button to increase the temperature setting in 1°C / 1°F increments to 30°C / 86°F.

TIMER button- Push this button to activate the "Auto Start" or "Auto Stop" program.

FAN SPEED button- Use to select the fan speed in four steps. AUTO, LOW, MED, and HIGH.

ONE TOUCH button- When pushed the system will automatically shift to COOL operation with auto fan speed, with the setting temperature at 26°C / 80°F, and the timer setting program will be cancelled.

SLEEP button- Press this button to activate the Sleep mode. This function is available on COOL and AUTO mode only.

MODE

TIMER    SPEED

ENERGY SAVER

ONE TOUCH    SLEEP

➢ The remote signal receiver/sensor is located on the control panel of the air conditioner.

➢ Reception of signal commands is confirmed by an audible beep.

➢ Direct sunlight can interfere with the infrared signal.

➢ To replace batteries, remove the back cover by pressing where indicated and sliding off the battery cover.

# 5 Installation and Cleaning

## 5.1 Proper Installation and Drainage

Older Koldfront window air conditioners included a drain plug that could be removed to assist with water drainage in excessively humid operating environments. Current models DO NOT use drain plugs. WAC series air conditioners were modified to increase unit operating efficiency and as a result the drain hole and plug have been removed.

As water builds up towards the rear / back of the unit the fan blade will begin to splash and disperse that water over the condenser coils which significantly aids in cooling the internal components and increases the overall efficiency of the unit.  If there is an over-accumulation of water, it will simply drain out of the lower back edge of the unit onto the exterior ground. Provided that the unit has been installed properly with a slight rearward slope as indicated below, there will not be drainage issues with the unit.
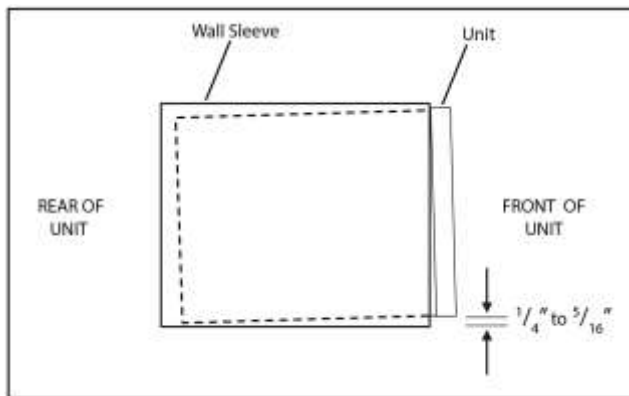


**Service Note:** Check that the air conditioner is tilted about 3° to 4° (degrees) downward slope toward the outside. After proper installation, water from the coils should not drain from the unit during normal use. Correct the slope if necessary.

## 5.2 Cleaning the Filter

In order to maintain energy efficiency and prolong the life of the unit the air filter should be checked at least once a month to see if cleaning is necessary. In addition, trapped particles in the filter can quickly build up and cause frost on the evaporator.
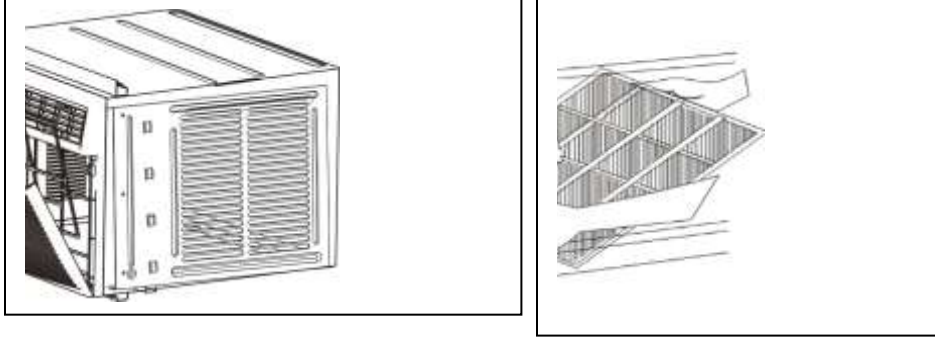


1. Open the front panel.

2. Take the filter by the center and pull up and out.

3. Wash the filter using liquid dishwashing detergent and warm water. Rinse filter thoroughly. Gently shake excess water from the filter. Be sure the filter is thoroughly dry before replacing.

4. You may also gently use a vacuum to clean the filter.

5. Reinstall the air filter once it's clean and dry.

**Service Note:**

1. Never use hot water over 104℉(40℃) to clean the air filter.

2. Never attempt to operate the unit without the air filter.

3. The air filter should be checked at least once a month to see if cleaning is necessary.

4. When the check filter light comes on clean the filter.  It will be prolong the life of the unit and save energy.

5. When the AC has not used for a for a prolonged period of time clean the filter before re-use.

# 6 Modes and Operating Conditions
## 6.1 Terms and Definitions

1.  TA: Temperature of indoor ambient.

2.  TE: Temperature of evaporator.

3.  TS: The set temperature.

4.  DAHT: Heater sensor.

## 6.2 Protection Functions

- The compressor restart protection has a delay of 3 minutes.

- 5 minute operation for compressor in cooling mode.

- Sensor protection against an open or short circuit.

## 6.3 Auto Mode

- AUTO Mode is a setting that allows the unit to automatically switch between COOL and FAN in order to achieve and maintain the desired set temperature.

- In  Auto mode the unit will choose cooling or fan-only mode based on ΔT(ΔT=TA-TS)

| ΔT = TA - TS | Running mode |
|---|---|
| ΔT $>$ 4°F | Cooling |
| -2°F ≤ ΔT ≤ 4°F | Fan-only |

- The unit will default to running mode when in auto mode under the following circumstances:

1.  Powering on, changing mode to auto mode or adjusting temperature in auto mode will cause the unit to default to running mode again.

2.  A: In auto mode, if the compressor does not run for 15 minutes check condition B.

3.  B: If ΔT<-8°F or ΔT $>$2°F, the unit will default to running mode again according to ΔT until the compressor stops.

## 6.4 Fan-Only Mode

➤ If the temperature can't be controlled by the selected mode and the room ambient temperature is shown on the display the unit will default to fan only mode.

➤ The readout can only display a temperature of 32 to 99 °F (0 to 37℃.) If the temperature is out of that range the display will show LO or HI.

➤ The Timer function works in fan-only mode.

➤ The follow me function (on some models) does not work in fan-only mode.

## 6.5 Cooling Mode

➢ The cooling temperature can be set from 62 to 86°F (17 to 30℃.)

➢ Sleep, Timer and Energy Saver functions work in cooling mode.

➢ The compressor will run when the difference between the set temperature and the actual ambient room temperature conforms to the chart below:

```
Operation conditon

(TA-Ts)℉                    compressor on

  +2

   0
           compressor off with a delay of 1 minute
```
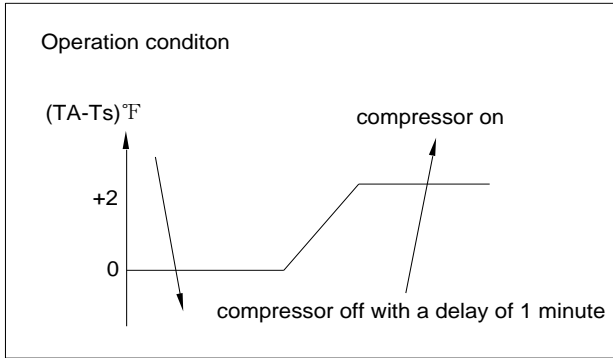
1. When TA≤TS (for 1 minute) the compressor turns off.

2. When T1>TS+2°F the compressor turns on.


## 6.6 Auto-Defrost Function

• The Auto-defrost function operates according to the chart below:

```
TE ℉                       compressor on

  55

  30
           compressor off
           when TE is lower than 30℉
           lasting for 5 seconds
```
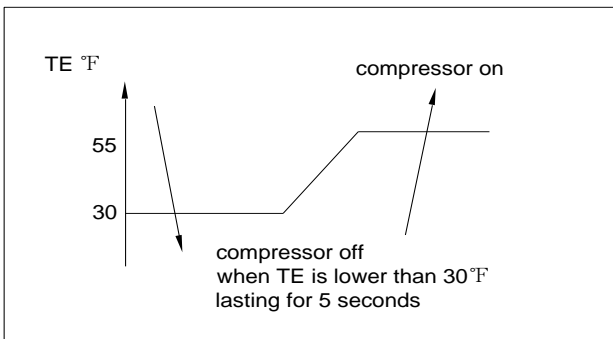
1. When TE is below 30°F the evaporator will frost. As the unit defrosts the indoor fan will continue to operate.

2. When the temperature is up over 55°F the unit will stop defrosting.

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## 6.7 Dry Mode

- In this mode, the air conditioner will operate as a dehumidifier. Because the conditioned space is closed or sealed, some degree of cooling will continue to occur.

- The dry mode temperature can be set from 62 to 86°F (17 to 30℃.)

- The fan speed is Low and can't be controlled.

- Sleep function works in dry mode.

## 6.8 Sleep Mode

➢ This mode has a duration of 7 hours and can be used in Cool, Dry and Heat mode.

➢ In sleep mode the fan speed will default to Auto.

➢ In the first 60 minutes, the set temp will rise (or lower for heating mode) 2°F (1℃) each half hour. Then it will keep a steady temperature for 6 hours until the mode stops.

➢ If you change any settings after sleep mode starts, the function will stop. Press sleep button again or use the remote control to start it again.

# 7 Troubleshooting

## 7.1 Troubleshooting Guide

| Problem | Possible Cause | Solution |
|---|---|---|
| Air conditioner does not function at all. | Wall plug is disconnected. | Insert plug firmly into proper wall outlet. |
| | House fuse blown or circuit breaker tripped. | Replace fuse with time delay type or reset circuit breaker. |
| | Power cord is tripped. | Press the RESET button on the power cord. |
| | Unit is turned OFF. | Turn unit ON and set to desired setting. |
| | Ribbon cable to control panel is disconnected. | Remove front grill and reconnect cable. |
| | Loose or disconnected wiring on main PCB. | Remove front grill and outer shell. Check all connections to the PCB and reconnect any loose or disconnected leads. |
| Air from unit does not feel cold enough. | Room temperature is below 62℉ (17℃). | Cooling will not occur until room temperature rises above 62℉ (17℃). |
| | Temperature sensor behind the front grill and air filter is touching the cold evaporator. | Realign sensor so it does not touch the evaporator coil. It should only be sensing the air temperature leaving the evaporator. |
| | Set temperature is too high. | Set to a Lower temperature. |
| | Compressor is shut-off by changing modes. | Wait approximately 3 minutes and listen for compressor to restart when set in COOL mode. |
| Air conditioner cooling, but room is too warm - ice forming on cooling coil behind front grill. | Outdoor temperature below 62℉ (17℃). | To defrost the coil, set to FAN ONLY mode. |
| | Air filter may be dirty. | Clean filter. Refer to Installation and Cleaning section. To defrost, set to FAN ONLY mode. |
| | Thermostat set too cold for night-time cooling. | To defrost the coil, set to FAN ONLY mode. Then set temperature to a Higher setting. |
| Air conditioner cooling, but room is too warm - **NO** ice forming on cooling coil behind front grill. | Dirty air filter- air restricted. | Clean air filter. Refer to Installation and Cleaning section. |
| | Temperature is set too High. | Set to a Lower temperature. |
| | The directional louvers on the front are positioned improperly. | Position louvers for better air distribution. |

| | Front of unit is blocked by drapes, blinds, furniture, etc. and is restricting air distribution. | Clear blockage in front of unit. |
|---|---|---|
| | Doors, windows, registers, etc. are open and cold air is escaping. | Close doors, windows, registers. |
| | Unit recently turned on in hot room. | Allow additional time for unit to remove stored heat from walls, ceiling, floor and furniture. |
| Air conditioner turns on and off frequently. | Dirty air filter- air restricted. | Clean air filter. |
| | Outside temperature is extremely hot. | Set FAN speed to a Higher setting to push more air through the coils. |
| Noise when unit is cooling. | Air movement sound. | This is normal. If too loud, set to a slower FAN setting. |
| | Window vibration - poor installation. | Refer to installation instructions or check with installer. |
| Water dripping INSIDE when unit is cooling. | Improper installation. | Tilt air conditioner slightly downward toward the outside to allow water drainage. Refer to installation instructions - check with installer. |
| Water dripping OUTSIDE when unit is cooling. | Unit removing large quantity of moisture from humid room. | This is normal during very humid days. |
| Room too cold | Set temperature is too low. | Increase the set temperature. |

## 7.2 Error Codes and Sensor Malfunctions

| Display | Error | Solution |
|---|---|---|
| AS | Room temperature sensor error.* | ➢ Check sensor connection to main PCB and secure any detached or loose connections. |
| LO | Room sensor is an open circuit.* | |
| HI | Room sensor is a short circuit.* | ➢ Check sensor wire for damage and repair if possible. |
| ● | Defrost sensor is open or short circuit. | ➢ Test sensor (see table 7.3) Replace sensor if defective. |

➢ If display indicates an AS error, use the mode button to select "Fan" and LO or HI will be displayed to indicate the underlying condition. See section 7.3 for additional information.

## 7.3 Temperature Sensor Resistance Test Table

| Temp. ℃ | Temp. ℉ | Resistance KΩ | Temp. ℃ | Temp. ℉ | Resistance KΩ | Temp. ℃ | Temp. ℉ | Resistance KΩ |
|---|---|---|---|---|---|---|---|---|
| -10 | 14 | 62.2756 | 17 | 62.6 | 14.6181 | 44 | 111.2 | 4.3874 |
| -9 | 15.8 | 58.7079 | 18 | 64.4 | 13.918 | 45 | 113 | 4.2126 |
| -8 | 17.6 | 56.3694 | 19 | 66.2 | 13.2631 | 46 | 114.8 | 4.0459 |
| -7 | 19.4 | 52.2438 | 20 | 68 | 12.6431 | 47 | 116.6 | 3.8867 |
| -6 | 21.2 | 49.3161 | 21 | 69.8 | 12.0561 | 48 | 118.4 | 3.7348 |
| -5 | 23 | 46.5725 | 22 | 71.6 | 11.5 | 49 | 120.2 | 3.5896 |
| -4 | 24.8 | 44 | 23 | 73.4 | 10.9731 | 50 | 122 | 3.451 |
| -3 | 26.6 | 41.5878 | 24 | 75.2 | 10.4736 | 51 | 123.8 | 3.3185 |
| -2 | 28.4 | 39.8239 | 25 | 77 | 10 | 52 | 125.6 | 3.1918 |
| -1 | 30.2 | 37.1988 | 26 | 78.8 | 9.5507 | 53 | 127.4 | 3.0707 |
| 0 | 32 | 35.2024 | 27 | 80.6 | 9.1245 | 54 | 129.2 | 2.959 |
| 1 | 33.8 | 33.3269 | 28 | 82.4 | 8.7198 | 55 | 131 | 2.8442 |
| 2 | 35.6 | 31.5635 | 29 | 84.2 | 8.3357 | 56 | 132.8 | 2.7382 |
| 3 | 37.4 | 29.9058 | 30 | 86 | 7.9708 | 57 | 134.6 | 2.6368 |
| 4 | 39.2 | 28.3459 | 31 | 87.8 | 7.6241 | 58 | 136.4 | 2.5397 |
| 5 | 41 | 26.8778 | 32 | 89.6 | 7.2946 | 59 | 138.2 | 2.4468 |
| 6 | 42.8 | 25.4954 | 33 | 91.4 | 6.9814 | 60 | 140 | 2.3577 |
| 7 | 44.6 | 24.1932 | 34 | 93.2 | 6.6835 | 61 | 141.8 | 2.2725 |
| 8 | 46.4 | 22.5662 | 35 | 95 | 6.4002 | 62 | 143.6 | 2.1907 |
| 9 | 48.2 | 21.8094 | 36 | 96.8 | 6.1306 | 63 | 145.4 | 2.1124 |
| 10 | 50 | 20.7184 | 37 | 98.6 | 5.8736 | 64 | 147.2 | 2.0373 |
| 11 | 51.8 | 19.6891 | 38 | 100.4 | 5.6296 | 65 | 149 | 1.9653 |
| 12 | 53.6 | 18.7177 | 39 | 102.2 | 5.3969 | 66 | 150.8 | 1.8963 |
| 13 | 55.4 | 17.8005 | 40 | 104 | 5.1752 | 67 | 152.6 | 1.83 |
| 14 | 57.2 | 16.9341 | 41 | 105.8 | 4.9639 | 68 | 154.4 | 1.7665 |
| 15 | 59 | 16.1156 | 42 | 107.6 | 4.7625 | 69 | 156.2 | 1.7055 |
| 16 | 60.8 | 15.3418 | 43 | 109.4 | 4.5705 | 70 | 158 | 1.6469 |

| DATE | REVISION NOTES |
|------|----------------|
| 04/11/2018 | INITIAL DOCUMENT |