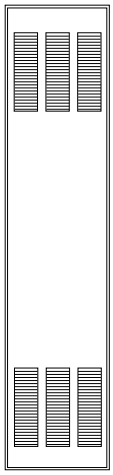
Marley®
Engineered Products



Electric Counterflow Wall Furnace

Model #	Voltage	Watts	Amps	BTU/Hr.
CFWF920A	240V	9.2kW	38	31,395

Installation & Maintenance Instructions

Dear Owner,

Congratulations! Thank you for purchasing this new heater manufactured by Marley Engineered Products. You have made a wise investment selecting the highest quality product in the heating industry. Please carefully read the installation and maintenance directions shown in this manual. You should enjoy years of efficient heating comfort with this product from Marley Engineered Products... the industry's leader in design, manufacturing, quality, and service.

... The Employees of
Marley Engineered Products

⚠ WARNING ⚠

Read Carefully - These instructions are written to help you prevent difficulties that might arise during installation of your heaters. Studying the instructions first may save you considerable time and money later. Observe the following procedures, and cut your installation time to a minimum.

TO REDUCE RISK OF FIRE OR ELECTRICAL SHOCK:

1. Disconnect all power coming to heater at main service panel before wiring or servicing.
2. All wiring must be in accordance with the National and Local Electrical Codes and the heater must be grounded.
3. Verify the power supply voltage coming to heater matches the ratings printed on the heater nameplate before energizing.
4. This heater is hot when in use. To avoid burns, do not let bare skin touch hot surfaces.
5. Do not insert or allow foreign objects to enter any ventilation or exhaust opening as this may cause an electric shock, fire,or damage to the heater.
6. Do not block air intakes or exhaust in any manner. Keep combustible materials, such as crates, drapes, etc., away from heater. Do not install behind doors, furniture, towels, or boxes.
7. A heater has hot and arcing or sparking parts inside. Do not use it in areas where gasoline, paint, or flammable liquids are used or stored.
8. Use this heater only as described in this manual. Any other use not recommended by the manufacturer may cause fire, electric shock, or injury to persons.
9. This heater is not approved for use in corrosive atmospheres such as marine, green house, or chemical storage areas.
10. Do not install this heater in an alcove.
11. Do not install this heater in a travel trailer or recreational vehicle.

SAVE THESE INSTRUCTIONS

CFWF920A Description

Your Counterflow Wall Furnace is shipped assembled for installation on any wall. It may be recessed up to 5-3/8 inches (137 mm) with studs spaced 16 inches (406 mm) on center, or it may be mounted directly on the wall surface.

This heater works by drawing cool air in at the top grille inlet and pushing it with a fan downward over the heating element. Warm air is discharged into the room through the bottom grille outlet near the floor. The warm air at the floor creates a gentle convective process in the room, preventing stratification of warm air near the ceiling and ensuring comfort for the occupants.

This heater runs on single-phase 240V line voltage and produces 9.2 kW of heat or 31,395 BTU/Hr.

The Counterflow Wall Furnace is controlled by a low voltage wall-mounted thermostat (provided). The unit is made of heavy gauge steel with a durable baked powder coat finish.

Removing your Furnace from the Carton

The shipping carton contains the heater and the parts needed for installation.

1. While the heater is still in the carton, lift straight up on the top of the furnace. Remove the top trim cover with its packing materials and the hardware kit (thermostat, wire, and screws). Put this hardware kit aside where it will not be lost or damaged.
2. Finish removing heater from the carton and lay on its back. Carefully remove the remaining packing supports from around the furnace and set aside.
3. Remove the screws from the top front panel. Gently pull panel toward the top of the cabinet about 1/2 inch (13 mm). Panel will loosen. Remove panel from cabinet and set top front panel and screws aside where they will not be lost or damaged.
4. Give fan blade a small push counterclockwise to ensure that it spins freely.
5. Remove the four screws holding the junction box cover above the fan. Place cover and screws aside where they cannot be lost or damaged. The electrical junction box and transformer should now be accessible. Refer to the section "ELECTRICAL WIRING" before attempting to wire your heater.
6. Remove the four mounting screws from the bottom front panel. Remove panel from cabinet. Set panel and screws aside where they will not be lost or damaged.
7. Before discarding packing material, examine it carefully for any loose furnace parts. Dispose of packing material properly (recycle).

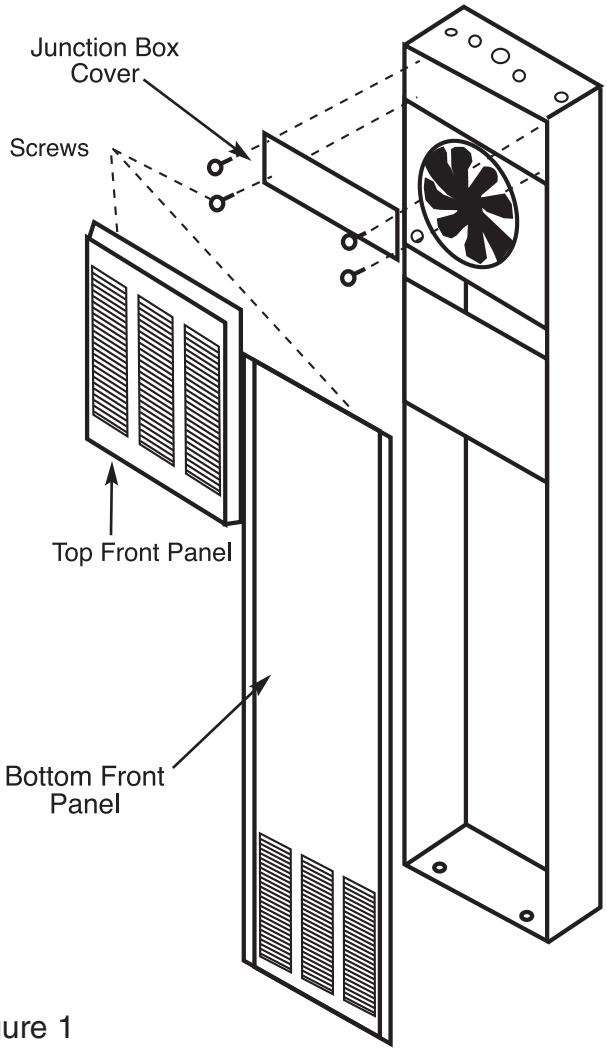


Figure 1

Optional Accessories

Rear Outlet Kit CFWFRO

This accessory allows you to divert some heated air to a second room behind the furnace. The finished wall of this room must be within 10 inches (254 mm) of the furnace. The built-in damper allows you to close the rear outlet, rediverting all the air to the front outlet grill. If this accessory is to be used, the opening must be cut in the rear of the cabinet, at this time. See “Optional Rear Outlet Installation” section of this manual.

How to Install Your Wall Furnace

Follow the directions carefully to ensure proper installation and safe operation of your Counterflow Wall Furnace. All wiring must be in accordance with the National and Local Electrical Codes and the heater must be grounded as a precaution against possible electric shock. If you are not sure what the requirements are, check with your local authorities for local and state codes affecting installation. Always get professional help when needed.

Locating the Counterflow Wall Furnace & Thermostat

1. Furnace can be surface mounted or recessed in any interior or exterior wall.

Note: The optional rear outlet (CFWFRO) may only be used on an interior wall.

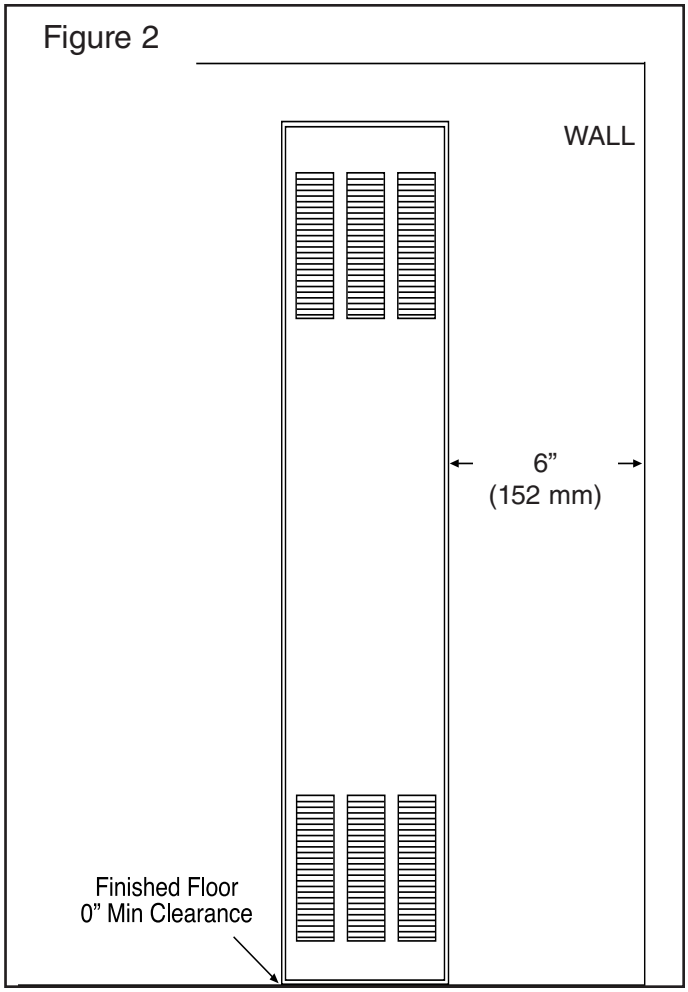
2. This heater may be recessed a maximum of 5-3/8 inches (137 mm).

Note: Check all clearances. The side of the furnace must be at least 6 inches (152 mm) from a corner or from a wall divider.

Note: Your wall furnace works best when it is placed as near to the center of the space to be heated as possible.

3. Ensure that electrical service is available at your desired installation location,
4. To ensure that there are adequate clearances and service access, the front of the heater must face the open room. Do not place furniture directly in front of the Counterflow Wall Furnace.
5. Locate the thermostat approximately 5 feet (152 cm) above the floor on an inside wall. Since you want the thermostat to sense average room temperatures, avoid cold and drafty locations and warm or sunny locations which could mislead the sensing device in the thermostat. You have been supplied with approximately 20 feet (610 cm) of thermostat wire. This should allow you to locate the thermostat approximately 16 feet (489 cm) from the furnace if the wire is run through the attic, 12 feet (366 cm) if under the floor.
6. After selecting a location for your Counterflow Wall Furnace, ensure that there are no pipes, wiring, etc. that would interfere with the heater or thermostat location. If so, select another location.

Figure 2



Recessed Mount Installation

CAUTION

To avoid electrical shock, turn off electrical circuits that run through the wall where you are installing the furnace.

If you are using the optional rear outlet (CFWFRO), refer to Optional Rear Outlet Installation on page 7 before proceeding.

Locate Wall Studs

Use a stud locator or small finishing nails. Drive and remove a small finishing nail through the wall surface until you find a stud. Then locate the side of the stud using the same technique. Leaving that locating nail there, locate the other side of the stud. Once you have done this, you should be able to easily locate the next stud. The inside edge of the next stud should be approximately 14-1/2 inches (369 mm) from the one you just found.

Note: IF STUDS ARE NOT ON 16-INCH (406 mm) CENTERS, SEE CLOSE OFF STUD SPACE ON PAGE 4 AND 5.

Cut Wall Openings

Refer to Figure 3. Lay out and cut the required opening in wall.

The vertical height given includes an allowance of 3 inches (76 mm) extra to allow room for wiring after the furnace is installed.

Electrical Supply Rough-In

1. Make entry holes in the ceiling wall plate above the furnace to route the conduit, electrical power supply wires, and the thermostat wiring to the furnace.
2. If this is impractical, entry holes 1 inch (25 mm) for electrical conduit and 1/2 inch (13 mm) for thermostat wire may be drilled through either wall stud above the furnace and the wiring may be routed from an adjoining stud space. You may also route the wiring from the crawl space or basement to a point above the furnace to match the openings in Fig. 4.
3. Install conduit so that it extends 4 inches (102 mm) below the top of the furnace wall opening. One (1) inch (25 mm) of conduit should extend inside the furnace cabinet (See Fig. 3).

Note: Flexible conduit may be used only if it meets local codes and ordinances.

1. The electrical supply wires, ground wire, and the thermostat wires may now be routed to the furnace locations. See THERMOSTAT INSTALLATION, pages 6, and ELECTRICAL WIRING page 8.
2. Ensure that there is enough wire at the furnace to make the connections inside the furnace junction box.

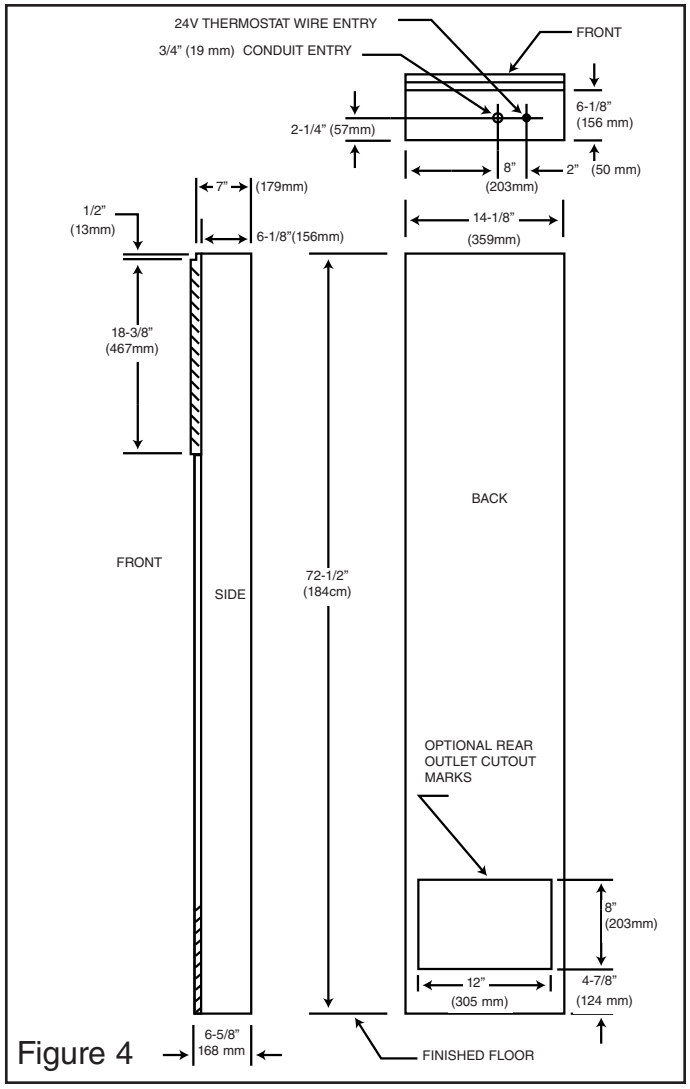


Figure 4

Close Off Stud Space (If Necessary)

If studs are not on 16 inch (406 mm) centers, cut the hole for the Counterflow Wall Furnace next to an existing stud and frame in the other side using a 2x4 (or other lumber as required) and spacer blocks or shims. See Fig. 5.

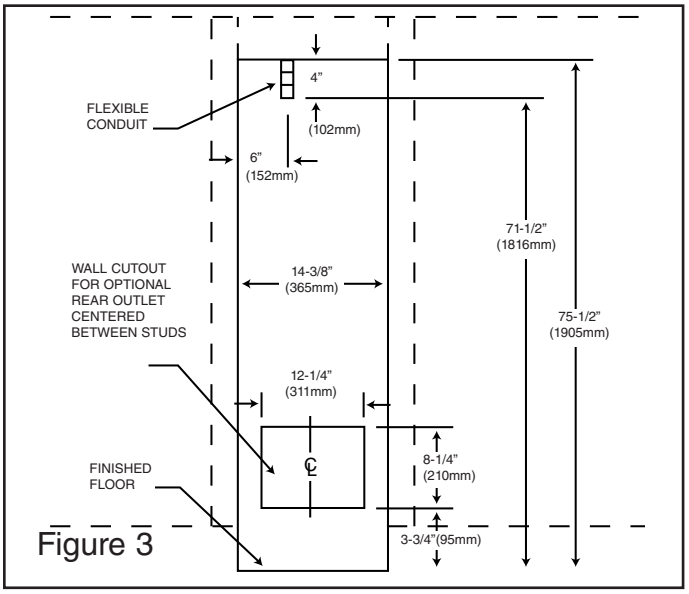


Figure 3

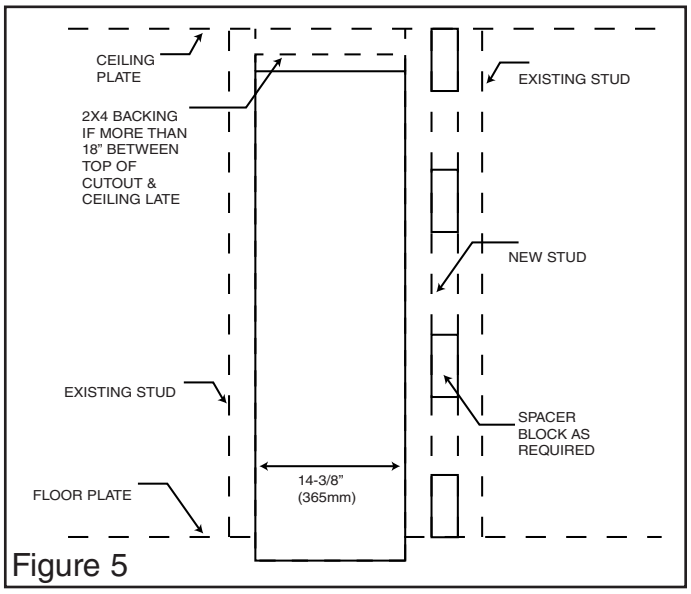


Figure 5

In some high ceilings the distance from the top of the cutout to the ceiling wall plate may be more than 18 inches (457 mm). If so, we recommend that you close off this space. Nail a 2x4 horizontally between the studs to close off this space. Drill entry holes in this as required.

CAUTION

To avoid electrical shock, turn off electrical circuits that run through the wall where you are installing the furnace.

Surface Mount Installation

If you are using the optional rear outlet (CFWFRO), refer to Optional Rear Outlet Installation on page 7 before proceeding.

Locate Wall Studs

Use a stud locator or small finishing nails. Drive and remove a small finishing nail through the wall surface until you find a stud. Then locate the side of the stud using the same technique. Leaving that locating nail there, locate the other side of the stud. Once you have done this, you should be able to easily locate the next stud. The inside edge of the next stud should be approximately 14-1/2 inches (368 mm) from the one you just found.

Cut Wall Opening

If you are using the optional rear outlet (CFWFRO), cut the 8-1/4 (210 mm) inch by 12-1/4 inch (311 mm) opening ONLY as shown in Fig. 3, page 4. Refer to Optional Rear Outlet Installation on page 7 before proceeding.

1. If impractical to route the wiring to the furnace from the attic, entry holes 1 inch (25 mm) for electrical conduit and 1/2 inch (13 mm) for thermostat wire may be drilled through either wall stud above the furnace and the wiring may be routed from an adjoining stud space. You may also route the wiring from the crawl space or basement to a point above the furnace to match the openings in Fig. 4.
2. To route the conduit, electrical power supply wires, and thermostat wires to the furnace top, entry holes must be made in the wallboard above the furnace location.
3. Electrical supply opening must be located at 2 inches (51 mm)above the furnace top to match opening shown in Fig. 4., page 6.
4. Drill a 1-inch (25 mm) hole for the electrical supply wiring and a 1/2 inch (13 mm) hole for the thermostat wires at the selected locations.
5. Route the flexible conduit to the 1 inch (25 mm) hole in the wallboard and allow 1 inch (25 mm) to extend below the furnace top (71-1/2 inches [1816 mm] from the finished floor). See Fig. 3, page 4.
6. You may now route the electrical supply wires, ground wire, and the thermostat wires to the furnace locations. See THERMOSTAT INSTALLATION, pages 6, and ELECTRICAL WIRING page 9.

Route Thermostat Cable

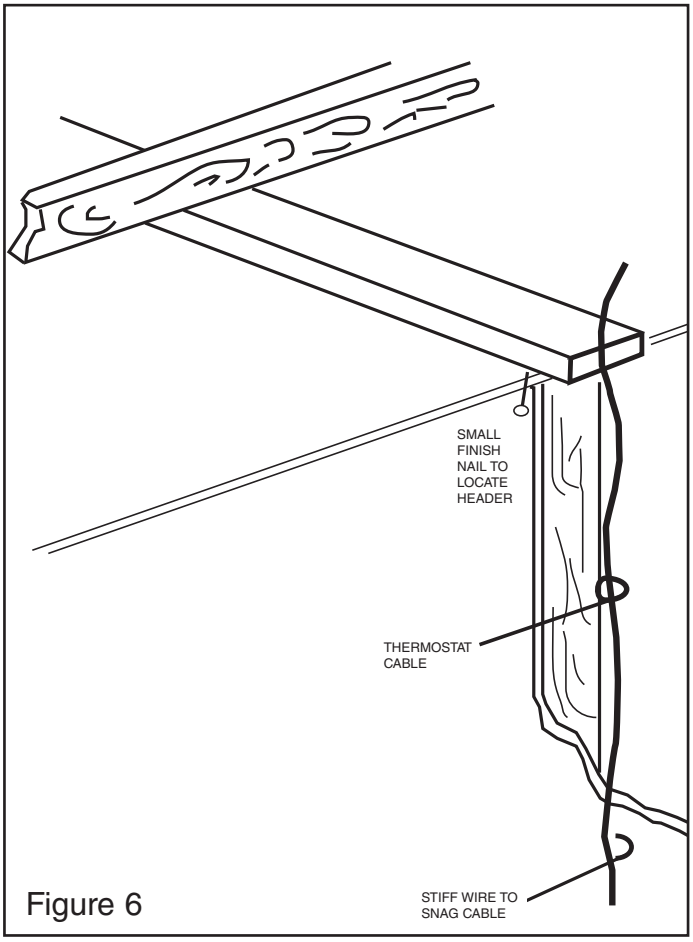


Figure 6

Thermostat Installation

1. Thermostat cable must be run to the location selected. All wiring must agree with the local codes and ordinances. These instructions describe how to wire the thermostat from the attic but it can also come from the basement or crawl space.
2. Locate the thermostat and then drive a small nail hole through the ceiling in the corner of the wall and ceiling above the thermostat location. Pull out the nail and push a small stiff wire through the hole to locate the wire in the attic. Drill a 1/2 inch (13 mm) hole through the ceiling wall plate.
3. Using the stiff wire, probe for obstructions in the wall. Then drill 1/2 inch (13 mm) hole through the wall at the selected location for the thermostat.
4. Feed the thermostat cable from the ceiling into the wall. Snag the thermostat cable through the hole and pull through so that 6 inches (152 mm) of cable protrudes.
5. Route cable to Counterflow Wall Furnace.

Mounting the Thermostat

1. Read instructions for thermostat. Grasp thermostat cover and pull gently outward at top to remove.
2. Connect the thermostat wires to terminal screws marked R and W on the base.
3. Push excess wire back through the hole in the wall and plug hole with insulation to prevent drafts from affecting thermostat operation.
4. Fasten the thermostat base to the wall through the mounting holes with the screws provided.
5. Set dip switches to 1-ON, 2-OFF, and 3-OFF.
6. Replace the thermostat cover.

Mounting Your Furnace

Note: If you are installing the CFWFRO optional rear outlet refer to Optional Rear Outlet Installation on page 7 before proceeding.

1. If you have elected to recess your heater, clear the recess of all construction debris.
2. Move furnace upright into position. Drop the flex conduit through the hole provided in the top of the furnace.
3. Fasten Furnace Top (Recessed Mounting) to the studs through holes provided into top flanges using (2) long screws provided (Fig. 8).

Fasten Furnace Top

(Surface Mounting)

Fasten furnace top to wall using (2) metal anchors (packed in hardware kit) by placing them over the back flange of furnace top and screwing to wall with (2) long screws provided. See Fig. 8.

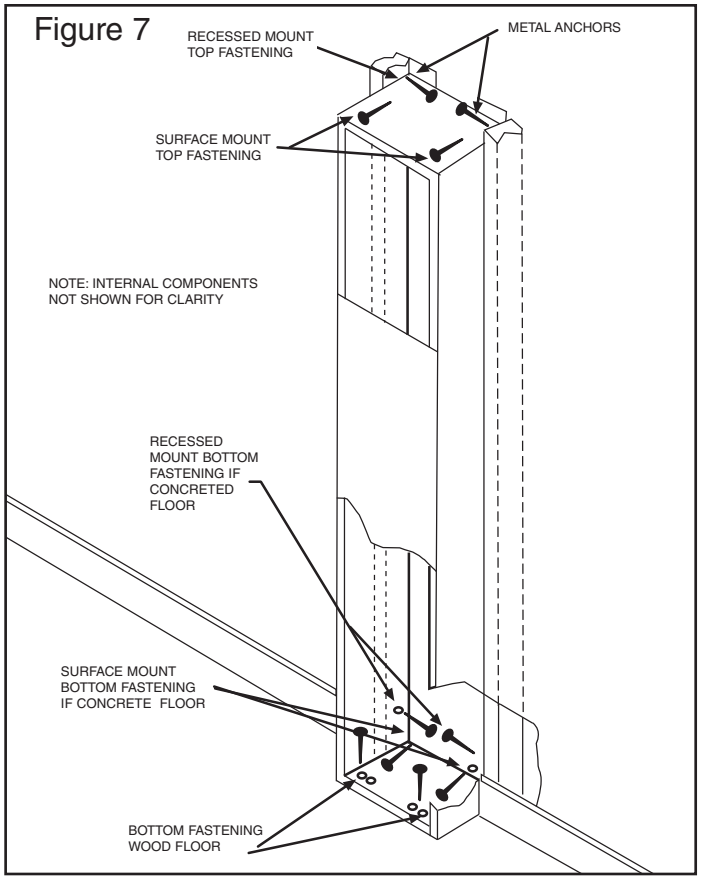
Note: Some fasteners are not provided and some holes are not pre-drilled due to the many various construction situations that may be encountered. Suitable fasteners for your application may be purchased at your local hardware store

Fasten Furnace Bottom

(Surface and Recessed Mount)

Drill (2) holes in the bottom of the furnace cabinet near each side. Fasten the furnace through these holes to the floor. If your floor is made of concrete, use the alternate fastening location as shown in Fig. 7.

Figure 7



NOTE: DO NOT USE BOTTOM DOOR HOLES FOR MOUNTING FURNACE

Figure 8

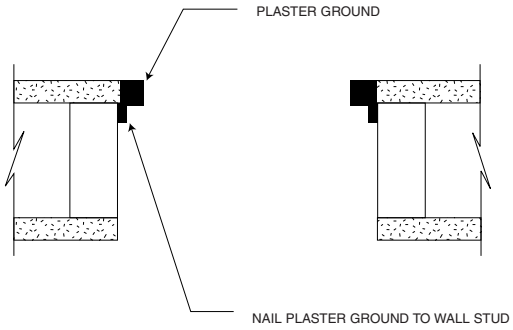
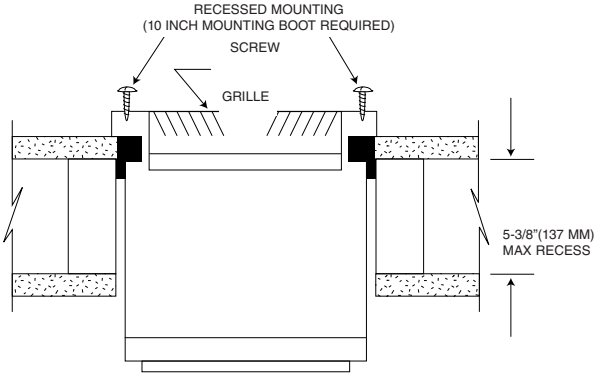


Figure 9



Optional Rear Outlet Installation

Recessed Mount Furnace

1. Cut 8-1/4 inch (210 mm) x 12-1/4 (311 mm) inch hole in wall as shown in Fig. 3, page 4.
2. There are four diamond-shaped holes at the bottom of the cabinet on the rear panel. Using these diamond-shaped holes, draw straight lines to mark your outline for the CFWFRO and cut out your opening.
3. Mount furnace in the recess. (See Mounting Your Furnace, Page 3).
4. Place plaster ground in opening and nail into studs. (Fig. 8)

Note: In new construction, install plaster ground before wall finish is applied. In drywall construction the plaster ground may be omitted.

5. Center grille over hole in rear wall and mark location of holes in grille on wall.
6. With a 1/8 inch drill bit, drill (2) holes through plaster or drywall and the cabinet for attaching grille.
7. Attach the grille with screws provided (Fig.10). The 10 inch boot is not required for recessed installation.

Surface Mount Furnace

1. Cut 8-1/4 inch (210 mm) x 12-1/4 inch (311 mm) hole in wall as shown in Fig. 3, page 4.
2. There are four diamond-shaped holes at the bottom of the cabinet on the rear panel. Using these diamond-shaped holes, draw straight lines to mark your outline for the CFWFRO and cut out your opening.
3. Place the boot against cabinet with inner side of boot exactly on the edges of the hole.
4. Mark screw locations, remove boot and drill holes for sheet metal screws.
5. Attach boot to back of furnace with screws provided.
6. Place plaster ground in opening and nail into studs (Fig. 8).

Note: In new construction, install plaster ground before wall finish is applied.

7. Place furnace with boot attached through hole in wall and mark end of the boot so it can be cut off flush with the outer wall.
8. Remove furnace from wall and cut boot where marked.
9. Place furnace with trimmed boot attached, through holes in wall and mount the furnace. (See Mounting Your Furnace, page 6).
10. Center grille over hole in rear wall and mark location of holes in grille on wall.
11. With a 1/8 inch drill bit, drill (2) holes through plaster ground and plaster (or drywall).
12. Attach grille with screws provided (Fig. 10).

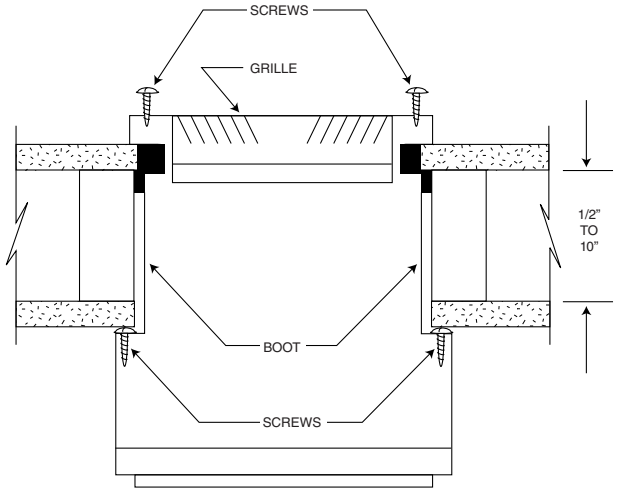


Figure 10

⚠ WARNING ⚠

Danger of Property Damage, Bodily Injury, or Death

TURN OFF ELECTRIC POWER AT FUSE BOX OR SERVICE PANEL BEFORE MAKING ANY ELECTRICAL CONNECTIONS.

INSULATE WHERE NECESSARY...

ALL LINE VOLTAGE AND GROUND CONNECTIONS MUST BE COMPLETED BEFORE ELECTRICAL POWER IS RESTORED.

⚠ CAUTION ⚠

Label all wires prior to disconnection when servicing. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

All electrical work must conform to your local codes and ordinances and with the National Electrical Codes.

Electric Power Supply

Your Counterflow Wall Furnace requires a 240-volt, 60 cycle, 40-ampere circuit from a separate circuit breaker or fuse in your service panel. Do not run supply wires inside the furnace cabinet, except from the top of the cabinet down to the junction box.

Junction Box

Power supply connections are made inside the junction box located in the upper end of the cabinet. See Fig. 11 and Fig. 1, page 2.

Electrical Connection

Connect 240V conduit to top of furnace as shown in Fig. 11. Pull supply wires through conduit and into junction box. Attach 240V supply wires to "LINE" connection at terminal board. Refer to wiring diagram on junction box cover plate. If you do not feel comfortable doing this, or have any doubts
how to comply with code, consult your electrical inspector or a licensed electrician.

Grounding

Provide ground connection from the unit's terminal board to a grounded connection in the electrical service panel or a properly driven and electrically grounded ground rod.

Low Voltage Connections

Run thermostat wire to the furnace. See THERMOSTAT INSTALLATION, page 6.

Connect the thermostat wires to the two (thermostat) wires extending inside the junction box. Refer to wiring diagram on junction box cover plate and Fig. 11.

When furnace mounting has been completed, see steps 1, 2, and 3 below.

Refer to Fig. 1, page 2.

1. Replace junction box cover plate. Tighten screws securely.
2. Replace bottom front panel
3. Replace top front panel.

Note: For supply connections use 6 AWG or larger wires suitable for at least 60 C (140 F). Use copper wire only.

Operating Your Furnace

This heater is controlled by a 24-volt wall thermostat that is included. Set the thermostat to a higher temperature than you think will be comfortable. Let the heater run and when the room reaches a comfortable temperature, adjust the dial counter-clockwise slowly until the heater cuts off. The thermostat will maintain this temperature.

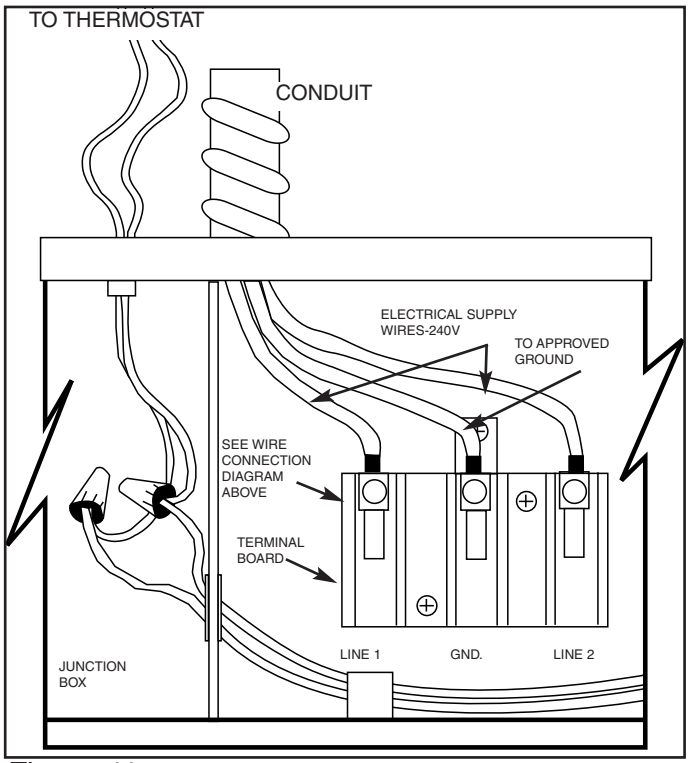


Figure 11 NOTE: ALL WIRING NOT SHOWN

This heater is equipped with a manual reset safety limit device. This device will automatically turn off the heater if it should operate at abnormal temperatures. The manual reset button is located at the bottom right of the fan panel (visible through the grille). Also, a red pilot light, located on the top right of the fan panel (visible through the grille) will illuminate to alert that the device has activated. Once the heater has cooled, push the reset button through the grille. The heater should return to normal operation.

⚠ WARNING ⚠

If this red pilot light comes on, this means your heater has operated abnormally. Check for air blockages and remove. If this does not solve your problem, call a qualified Service Technician.

Additionally, your heater is equipped with micro temp heat limits ("one-shots") to protect against excessive and prolonged current surges. If these device(s) open(s) the heating circuit, the limit(s) must be replaced by a qualified Service Technician, who will also determine and correct the cause of failure.

Air volume may be adjusted if you have installed the CFWFRO rear grille. **Do not attempt to reduce the flow of air from the front grille.** Doing so will cause the limit devices to shut down the heater. Do not obstruct the front grille (or rear grille, if so equipped).

How to Take Care of Your Furnace

Annual Upkeep

1. Heating Element and Optional Rear Outlet

WARNING

Turn off electric power supply at disconnect switch, fuse box, or service panel before removing any doors or access or service panels from unit.

Keep clean at all times. Use a soft brush or vacuum cleaner to clean all foreign materials from inlet and outlet grille (and rear outlet grille if installed). To access the heating element, remove (2) screws (Fig. 1, page 2) and grasp face panel near bottom. Pull up and out. After cleaning heating elements and Optional Rear Outlet, replace the panel.

2. Motor and Fan

In order to get the maximum life out of your fan your should clean any dust (by vacuuming or blowing) from the ventilation holes. You should also add a few drops of #20 non-detergent oil to the bearing cavity (See Fig. 12).

To access the motor:

A. Remove the four screws holding the fan shroud to side flanges of cabinet and remove the shroud (Fig. 1, page 2).
B. Caution: Be sure to mark the position of the fan blade in relation to the motor shaft before removing. Examine the blade nut and the amount of shaft that is visible. Mark the motor shaft with a scratch or in another fashion in order to reinstall the fan to its original position.
C. Loosen the 5/32-inch "allen head" set screw holding the fan blade to the motor shaft and remove the fan blade. A wrench is provided for this purpose.
D. Reverse steps 1-3 to replace the fan blade.

WARNING

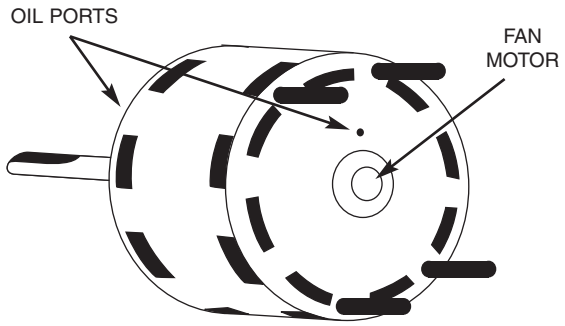
Danger of Bodily Injury

Turn off electric power supply at disconnect switch, fuse box, or service panel before removing any doors or access or service panels from unit.

1. Appliance Area

To more effectively heat your room and improve air circulation, do not place furniture closer than 4 feet to the front of the cabinet or 2 feet to the side of the cabinet.

Figure 12



CAUTION

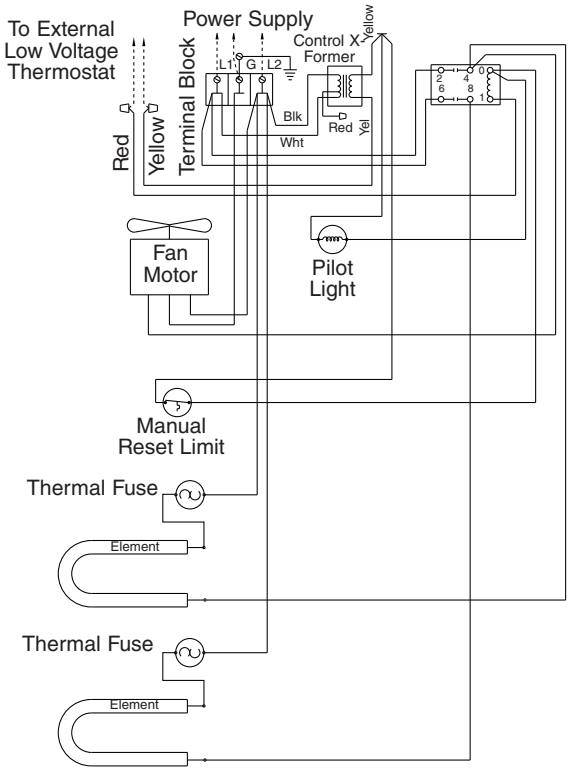
Source of Possible Ignition

High temperature. Keep combustible material away from front of the heater. The appliance must be kept clear and free from combustible material, gasoline, and other flammable vapor and liquids.

2. Cabinet Finish

Clean the cabinet with a damp rag. Do not use abrasive cleaners, as this may permanently damage the surface. This heater is finished with a heat resistant polyester powder baked finish. Do not refinish with wall paint.

WIRING DIAGRAM FOR MODEL CFWF920

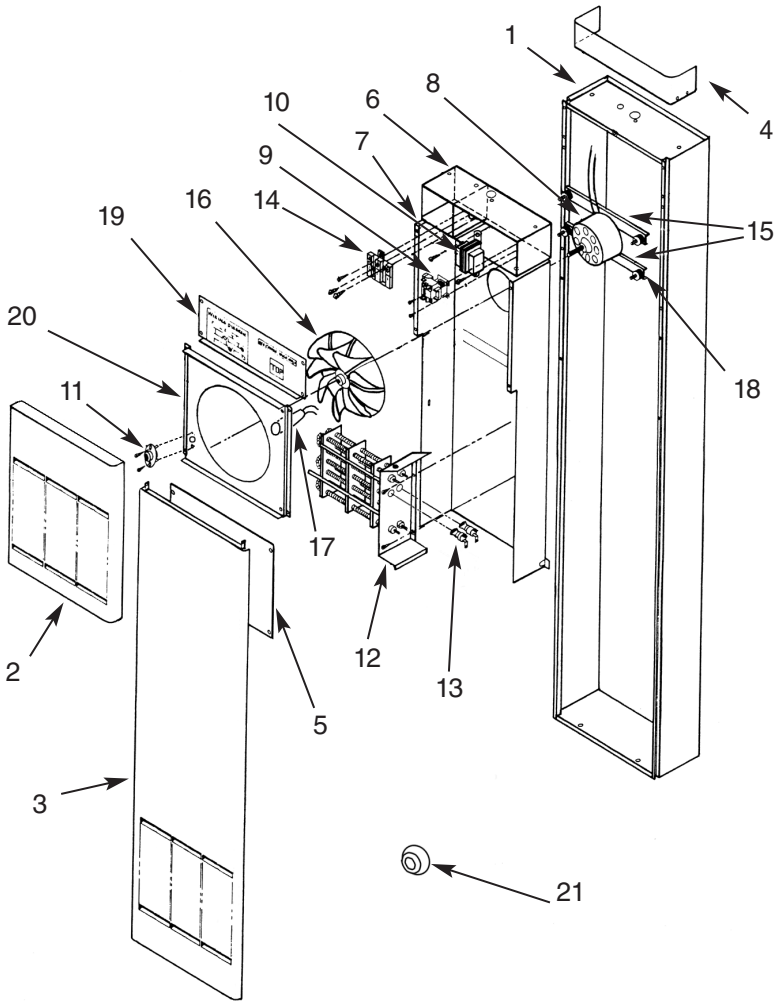


PARTS LIST FOR CFWF920A

ITEM	DESCRIPTION	PART NUMBER
1	OUTER CASING	2701-2033-000
2	TOP FRONT PANEL	1402-2312-000
3	BOTTOM FRONT PANEL	1402-2313-000
4	TOP TRIM COVER	5806-2004-000
5	COVER, ELEMENT	1402-2282-000
6	WIRING BOX ASSY.	1217-2057-000
7	FAN PANEL	4513-2152-001
8	MOTOR	3900-2036-000
9	RELAY	5018-2017-001
10	TRANSFORMER	5814-0003-000
11	RESET LIMIT	4520-2027-000
12	HEATING ELEMENT ASSY	1802-2117-000
13	FUSE LIMITER (2) +	4520-2052-000
14	POWER BLOCK	5823-0004-007
15	MOTOR BRACKET(2)	1215-2173-000
16	FAN BLADE ++	1210-2009-001
17	PILOT LIGHT	3510-2001-000
18	MOTOR MOUNT (4)	3902-2004-000
19	WIRING BOX COVER	1402-2281-000
20	VENTURI PLATE	4503-2075-000
21	WALL THERMOSTAT	T8775A1009
	INSTRUCTIONS	5200-2484-VAR
	LIMIT MOUNTING BRKT.	1215-2065-001

\+ The Fuse Limiter is not field replaceable and servicing should be referred to a qualified service technician.

++ Fan blade appearance not as shown.



LIMITED WARRANTY

All products manufactured by Marley Engineered Products are warranted against defects in workmanship and materials for one year from date of installation, except heating elements which are warranted against defects in workmanship and materials for five years from date of installation. This warranty does not apply to damage from accident, misuse, or alteration; nor where the connected voltage is more than 5% above the nameplate voltage; nor to equipment improperly installed or wired or maintained in violation of the product's installation instructions. All claims for warranty work must be accompanied by proof of the date of installation.

The customer shall be responsible for all costs incurred in the removal or reinstallation of products, including labor costs, and shipping costs incurred to return products to Marley Engineered Products Service Center. Within the limitations of this warranty, inoperative units should be returned to the nearest Marley authorized service center or the Marley Engineered Products Service Center, and we will repair or replace, at our option, at no charge to you with return freight paid by Marley. It is agreed that such repair or replacement is the exclusive remedy available from Marley Engineered Products.

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Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

For the address of your nearest authorized service center, contact Marley Engineered Products in Bennettsville, SC, at 1-800-642-4328. Merchandise returned to the factory must be accompanied by a return authorization and service identification tag, both available from Marley Engineered Products. When requesting return authorization, include all catalog numbers shown on the products.

HOW TO OBTAIN WARRANTY SERVICE AND WARRANTY PARTS PLUS GENERAL INFORMATION

1. Warranty Service or Parts **1-800-642-4328**
2. Purchase Replacement Parts **1-800-654-3545**
3. General Product Information **www.marleymep.com**

Note: When obtaining service always have the following:

1. Model number of the product
2. Date of manufacture
3. Part number or description

Marley® Engineered Products

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