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CAPTIVE-AIRE
THE PERFORMANCE COMPANY

TECHNICAL MANUAL

FOR
INSTALLATION, OPERATION
AND MAINTENANCE
OF
THE CAPTIVE-AIRE
MODEL "C-TPF" SERIES
POLLUTION CONTROL UNITS
WITH CFM-100 SERIES MONITORING STATION

WARNING

Improper installation, adjustment, alteration service or maintenance can cause property damage, injury or death. Read the installation, operation and maintenance instructions thoroughly before installing or servicing this equipment. Only trained and qualified service personnel should install or service this equipment.

CAPTIVE-AIRE SYSTEMS, INC.

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The Captive-Aire Unit is designed and engineered by
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TABLE OF CONTENTS

INTRODUCTION

Air quality is a major concern in many large cities world wide, particularly in America. As a result, many commercial kitchens will require pollution control equipment in their exhaust systems to comply with the increasing demands of environmental control agencies. In addition, pollution control equipment is being used for kitchens in high-rise buildings allowing the exhaust to discharge out the side of the structure which saves the cost of running the duct up many floors to the roof.

Smoke pollution control, in kitchen exhaust systems, has typically been accomplished by any one of the following methods: gas fired incinerators, scrubbers, filtration units or electrostatic precipitators (C-ESP). Incinerators and afterburners literally burn the pollutants and, while effective, can be very costly and hazardous to operate. Scrubbers consist of a water bath and extraction baffles to remove the pollutants and, though quite effective on grease removal, they typically require the addition of high efficiency filters to abate smoke below control agencies' standards. Filtration units use a series of impingement filters to remove the pollutants and if done properly can be quite effective on both smoke and grease.

Captive-Aire offers two types of pollution control equipment: the C-TPF Series (triple pass filter) detailed in this manual and the C-ESP Series (electrostatic precipitator) detailed in the C-ESP Series brochure. When initial cost is a greater concern, the C-TPF unit is a sound alternative.

The C-TPF unit is available in several configurations, as illustrated on the following pages, ranging in capacity from 1000 to 32,000 CFM (472 to 15,102 L/s). Most models can include an exhaust fan and odor abatement equipment as an option.

Basic Facts About Smoke

Smoke particles are extremely small and not visible to the human eye unless thousands of them are grouped together to form what we see as smoke. Individual particles are measured in units called microns and one micron equals 1/25,400 of an inch (1/64,516 of a cm).

Smoke generated by commercial cooking equipment has a particulate size of between 0.3 and 0.8 microns and it is these very small particles that smoke abatement equipment must remove from the airstream. The amount of smoke being discharged from a kitchen exhaust duct is measured in terms of its density, referred to as opacity - the degree to which emissions block light. A 100% opacity level would be solid black and 0% would be perfectly clear. Control agencies that have adopted smoke pollution ordinances are requiring an opacity level of no more than 20%, which is a very light blue smoke.

Typically, heavy smoke producing cooking such as charbroiling, creates an opacity level of 60% to 70%. Opacity readings are taken by the human eye by viewing the smoke being discharged and then assigning a percentage of opacity to what is seen. Though this method is quite subjective, it is the method practiced by control agency inspectors who are trained and certified in determining opacity percentages. Other more technical methods of determining opacity or particulate density are achieved through the use of opacity meters and cascade impactors. This level of analysis is usually referred to as source testing. Control agencies occasionally require this type of analysis and if so, the testing is conducted by state certified contractors which can be quite costly and time-consuming. The efficiency of a C-TPF is based on how well it reduces the opacity level of a given airstream.The Captive-Aire unit will reduce the opacity level below 20%, thereby meeting the requirements of environmental control agencies.

Basic Facts About Odor

Cooking odors (molecules) generated by the combustion of animal and vegetable matter result in an extremely complex mixture of reactive organic gases (ROG's). A small percentage of these odors may be absorbed by the grease particles but the vast majority exist separately in the airstream. The ROG molecules are much too small to be removed by any type of filter and therefore, other methods must be used. There are several methods with which to manage the odor. One method is to use a media bed. The two most popular types of media bed are activated charcoal, which absorbs and retains the odor molecules, and the use of an odor-oxidant media (potassium permanganate) which oxidizes the molecules to solids and then retains them. The other method involves the use of a liquid delivered with a finely atomized spray. This spray performs a similar function to potassium permanganate in that it adsorbs or chemically neutralizes odors. This process has the benefit of the end user being able to adjust the amount of spray and thus the effectiveness and cost of the odor control.

The life of the media bed type of odor control is dependent upon several factors such as how much media is used, type of odor, amount of odor molecules, grease loading and air temperature. Typically, any of the above mentioned types of media can remove 85% - 90% of the molecules. Determining the efficiency of odor control can be very subjective, as testing is usually conducted by the human nose. More scientific testing is available through ROG analysis, but this involves considerable costs.

Grease Removal - The Important First Step

Grease particles are also measured in terms of microns and grease generated by commercial cooking equipment has a particulate size of 10 microns and up. Pollution control equipment is not limited to removing smoke particles, but will also remove a majority of the grease particles remaining in the airstream. Therefore, the grease extraction efficiency of the exhaust hood plays an important role in the operation and performance of pollution control equipment.

Removal of grease particles before they reach smoke and odor control equipment will significantly increase the smoke abatement efficiency and the life of the odor abatement media. It is highly recommended that a Captive-Aire Ventilator be used with the C-TPF unit as it has a grease extraction efficiency of 95%. Other high efficiency exhaust hoods and standard filter type hoods may be used with the unit. Contact Captive-Aire Systems for details.

SPECIFICATIONS

General

Furnish one (1) Captive-Aire Pollution Control Unit model C-TPF series as manufactured by Captive-Aire Systems, Inc. of Youngsville, North Carolina in accordance with the following:

The pollution control unit shall consist of a smoke control section, odor control section (optional) and an exhaust fan section (optional) all built on a common base as an integral unit. Smoke control shall be accomplished by a three stage high efficiency filter section (C-TPF). The unit shall be ETL listed and labeled.

Smoke Control Section

The smoke control section shall have three phases of filters The filters shall consist of replaceable 30% pre-filter, 95% bag filter and a replaceable 99% final filter. Replaceable filters shall be mounted in filter slide tracks to prevent air bypass around the ends of the installed filter bank. Filters shall be accessed through removable side access panels with lift and turn latches.

Phase one filters shall have an average efficiency of 25 to 30% and an average arrestance of 90 to 92% in accordance with ASHRAE test standard 52.1-1992. Media support grid shall be on 1" centers with an open area 96%. Filter enclosing frame shall be a rigid, high wet strength beverage board, with diagonal support members 4" deep.

Phase two filters shall have an average efficiency of 90 to 95% in accordance with ASHRAE test standard 52.1-1992. Sealing surface and pocket retainers shall be configured to provide 84% open area. Seams in bag filters shall be sealed with foamseal adhesive to completely eliminate air leakage through stitch holes.

Phase three filters shall be 95% efficient on .03 micron particles (DOP smoke test), 97% efficient on nebulized staphylococcus aerosols, 99+% efficient on atmospheric test dust (ASHRAE standard 52.1-92). The casing shall be 16 gauge steel with corrugated aluminum separators to insure media stability. Media shall be fine-fiber, high strength microfiberglass paper. Media end cuts shall be encapsulated in urethane potting adhesive.

Fire Detection

A thermostat, set at 250° F, shall also be located in the filter section to shut down the exhaust fan in the event of a fire.

☐ **Optional Fire Damper for use in Canada**

The unit shall include a UL listed fire damper, with a 280° F fusible link, located downstream of the filters to prevent passage of fire to the duct downstream of the unit

Filter Monitoring Panel

A monitor panel, for remote location, shall be supplied for the operation and monitoring of the unit. The panel shall be constructed of 18 gauge stainless steel, number 4 finish, and be suitable for surface or recessed mounting. The panel face shall be a hinged door with a lift and turn flush latch. The panel shall include an air proving time delay, relays and indicator lights to continuously monitor the unit. Indicator lights shall be “Fan On”, “Normal Air”, “Low Air”, “Replace Pre-Filters”, “Replace Bag Filters”, “Replace Final Filter”, “Missing Filter”, and “Fire In Unit”. An audible alarm, with an alarm cancel button, shall be included and shall activate whenever the unit status is low air, replace filters, missing filters or fire in the unit. Status other than “Fire In The Unit” shall not shut down the exhaust fan.

Specifier Note: If the C-TPF unit is used in conjunction with a water wash ventilator, the monitor panel is built into the main water wash control cabinet model CGPC-6000 series.

Odor Control Options

☐ **Media bed of 50/50 Blend Potassium Permanganate and Carbon Blend**

The unit shall be provided with odor control utilizing a media bed of 50% potassium permanganate 50% carbon blend. The odor removal media shall be housed in slide out reusable steel modules. There shall be a 30% pleated media after filter located immediately downstream of the odor control media. Replaceable filters shall be mounted in filter slide tracks to prevent air bypass around the ends of the installed filter bank. The odor control media and after filters shall be removable through side access doors with lift and turn latches.

☐ **Spray Odor Control**

The unit shall be provided with a spray odor control system utilizing an odor neutralizer chemical. The odor spray control cabinet shall be mounted on the side of the unit and shall contain a liquid spray compressor piped to the spray nozzle in the fan plenum, adjustable delay timers with fuse protected circuitry factory wired to the unit electrical panel. The cabinet shall include one 5 gallon container of Formula GS-710 Odor Neutralizer. The cabinet shall contain a heater to prevent freezing of the odor neutralizer.

Exhaust Fan Options

☐ **Exhaust Fan (Standard Centrifugal Fan)**

The unit shall include a centrifugal exhaust fan. The exhaust fan shall be an SWSI upblast arrangement #9 or #10 with a non-overloading BI or AF wheel. The motor, drives, bearings and fan mounting base shall be located out of the exhaust air stream as required by the IMC (International Mechanical Code) and NFPA-96. The fan shall be AMCA certified and bear the AMCA seal for performance. The fan housing shall be constructed of heavy gauge steel. The fan bearings shall be heavy duty self-aligning pillow block type rigidly mounted on heavy structural steel supports. The motor shall be ODP three phase mounted on a common base with the fan and shall be pre-wired to the electrical cabinet located on the unit. The electrical cabinet shall include a disconnect switch, motor starter, overloads and fuses. The factory provided drive assembly shall be adjustable pitch on 5 HP and smaller, fixed pitch on 7.5 HP and larger. It shall also be sized for a minimum 1.5 service factor. After final system balancing, fixed pitch sheaves shall be provided and installed by the air balancing contractor to provide proper flow at actual installed conditions.

☐ **Exhaust Fan (Optional Tubular Fan)**

The unit shall include a tubular centrifugal exhaust fan. The exhaust fan shall be an arrangement #10 with a non-overloading BI, AF wheel. The motor, drives, bearings and fan mounting

base shall be located out of the exhaust air stream as required by the IMC (International Mechanical Code) and NFPA-96. The fan shall be AMCA certified and bear the AMCA seal for performance. The fan housing shall be constructed of heavy gauge steel. The fan bearings shall be heavy duty rigidly mounted on heavy structural steel supports. The motor shall be ODP three phase mounted on a common base with the fan and shall be pre-wired to the electrical cabinet located on the unit. The electrical cabinet shall include a disconnect switch, motor starter, overloads and fuses. The factory provided drive assembly shall be adjustable pitch on 5 HP and smaller and fixed pitch on 7.5 HP and larger. It shall also be sized for a minimum 1.5 service factor. After final system balancing, fixed pitch sheaves shall be provided and installed by the air balancing contractor to provide proper flow at actual installed conditions.

☐ **Exhaust Fan Housing**

The exhaust fan section of the unit shall be enclosed with the same material as the smoke control section. There shall be a removable panel for access to the fan.

Unit Construction

The unit housing shall be constructed of a minimum of 16 gauge G90 bright galvanized steel. The perimeter base shall be 12 gauge formed channel with lifting lugs at each corner and along the length as required. The internal housing shall be externally welded liquid tight for compliance to the International Mechanical Code and NFPA-96 grease duct construction requirements.

Fire Extinguishing System Options

Specifier Note: NFPA-96 requires a fire extinguishing system for protection of the smoke and odor control sections and protection of the duct down stream of any filters or dampers. Not all authorities having jurisdiction require protection. Check with your AHJ. If required, specify one of the following systems.

☐ **Wet chemical system**

Provide a complete factory mounted Ansul wet chemical fire extinguishing system, including nozzles piping and detection runs. Pipe penetrating the unit cabinet shall use a UL listed fitting. System shall be installed in accordance with the systems listing and NFPA-96. The Ansul Automan cabinet shall be mounted on the side of the unit for easy access, certification and service.

☐ **Water spray sprinkler fire system**

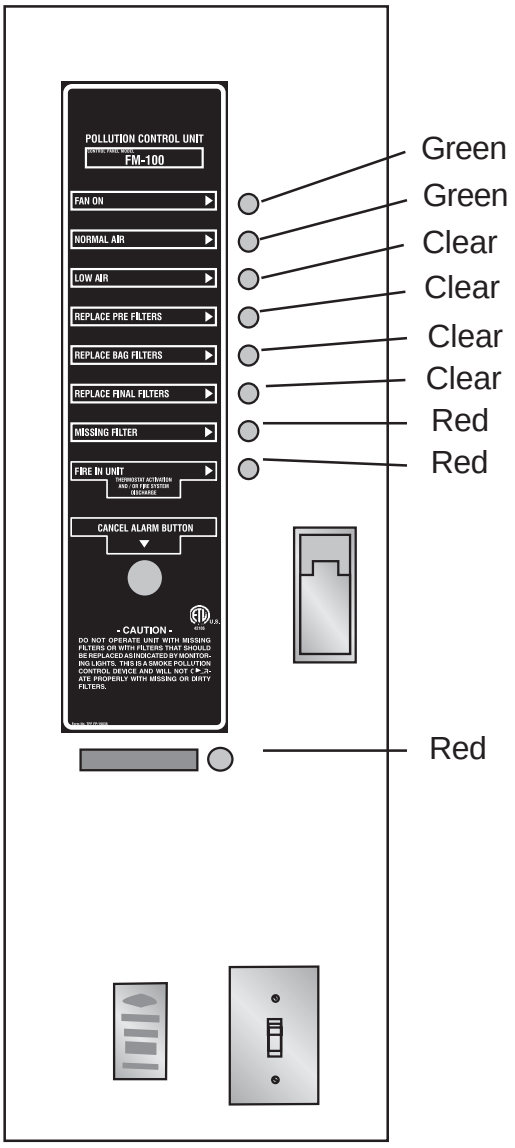
Specifier Note: Units that are located indoors may be factory pre-piped for a wet pipe building sprinkler system.

Provide a pre-piped water spray fire system installed in accordance with NFPA-96. The unit shall be piped with one pendent type sprinkler nozzle located in the smoke control section, one in the odor control section, if equipped with 50/50 media bed, and one in the exhaust fan section for interconnection to the building sprinkler system by the appropriate trades. Pipe penetrating the unit cabinet shall use a UL listed fitting. Nozzles shall be the bulb type rated at 325° F.

Check Out and Demonstration

Upon completion of installation, the entire pollution control system, including the kitchen exhaust hoods, shall be commissioned by a factory certified service technician. Start-up shall include checking all filters, filter monitoring station, odor control and exhaust fan. The appropriate maintenance personnel shall be given a technical manual and a complete demonstration of the system, including operation and maintenance procedures. Upon completion of the commissioning, a detailed start-up report shall be made available to the architect and owner certifying proper system operation. Changes required in fan drive components shall be performed by the air balancing contractor under the direction of the factory certified person(s) performing the start-up.

FILTER MONITORING STATION
CFM-100



MODEL NUMBER EXPLANATION

The assigned model number of a C-TPF unit will indicate the number of Filter Banks and if it has spray odor control, single or double pass odor control, if it has an exhaust fan plus other data. The following example shows the make-up of a model number.

The model number of your unit along with other data can be found on the nameplate which is attached to the electrical control panel on the unit. Refer to page 24.

Standard Prefix Series of ClearAir™ System (Remote Smoke Pollution Control)

Triple Pass Filter

Filter Configuration (W x H) - 1x1, 2x1, 3x1, 2x2, 3x2, 4x2, 3x3, 4x3, 3x4, 4x4

Odor Control Option:
SO = Single Pass Odor Control
DO = Double Pass Odor Control
SPO = Spray Odor

Total CFM (1000 - 32,000)

Exhaust Fan Option:
EFS = Exhaust Fan, unhoused, spring isolated
EFN = Exhaust Fan, unhoused, not spring isolated

EFHS = Exhaust Fan, housed, spring isolated
EFHN = Exhaust Fan, housed, not spring isolated

(BLANK) = No Exhaust Fan

Fan Type = C (Centrifugal), T (Tubular)

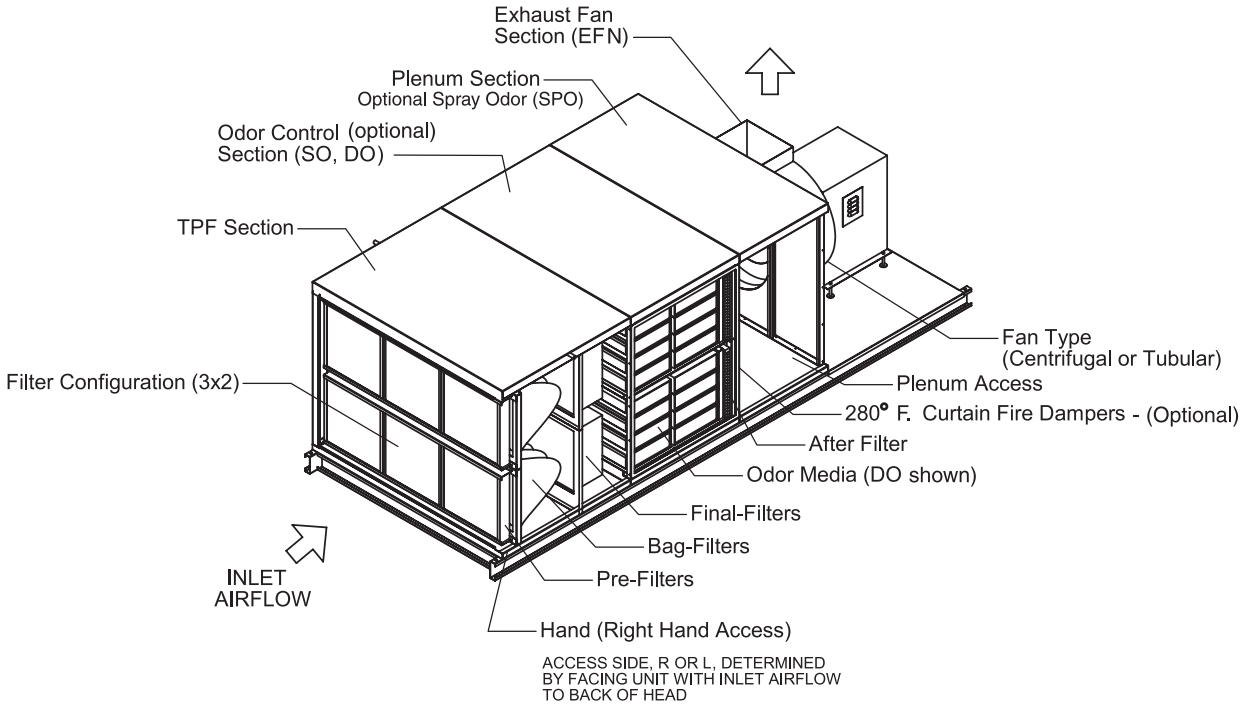
Fan Size (ie. 100 - 490)

Fan Motor H.P. (ie. 1 - 75)

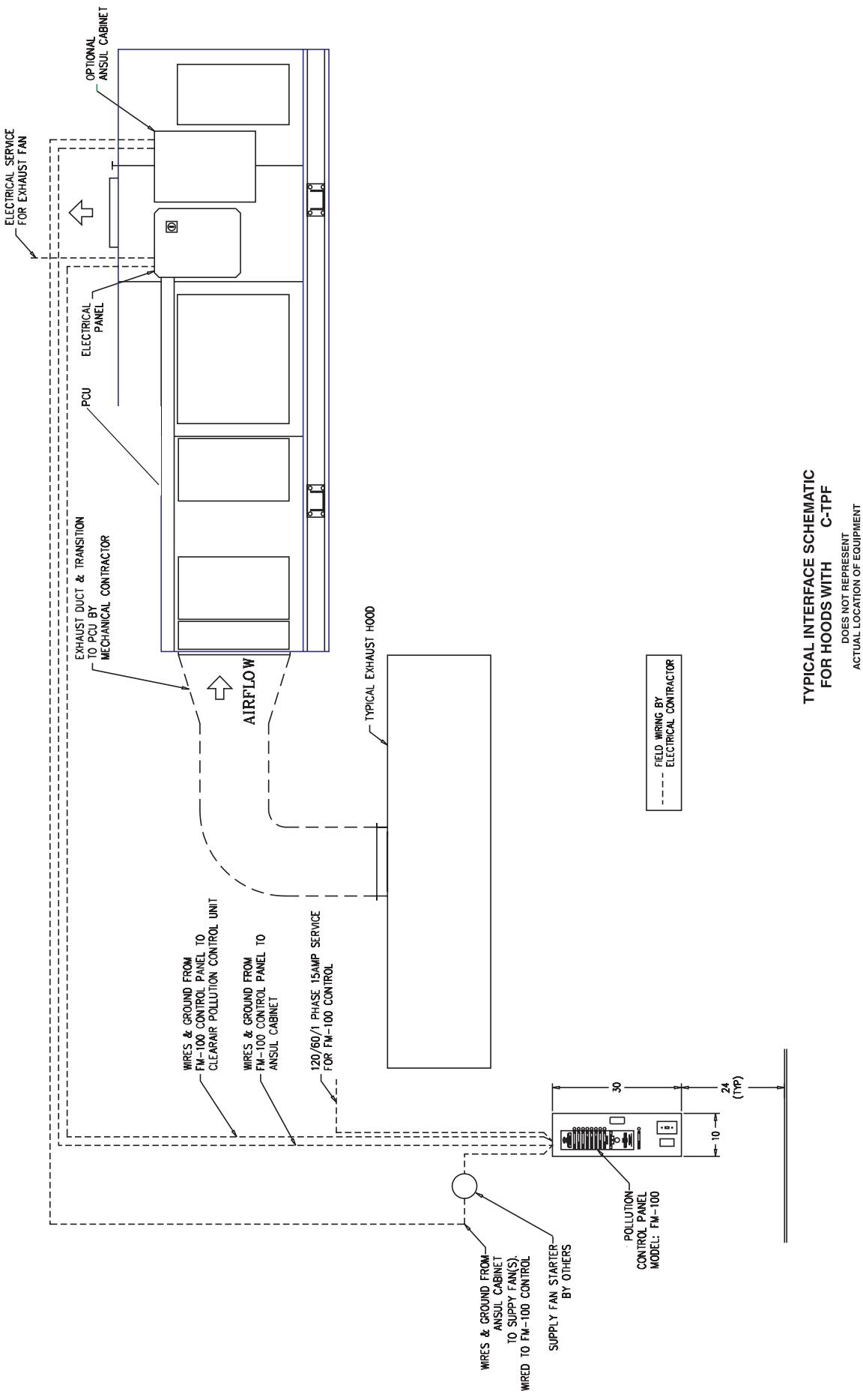
Hand - R = Right Hand
L = Left Hand

C	- TPF -	3x2	- DO -	CFM	- EFN	- C	- 300	- 15	- R
BLOCK	1	2	3	4	5	6	7	8	9

All Blank, if no exhaust fan



TYPICAL INSTALLATION

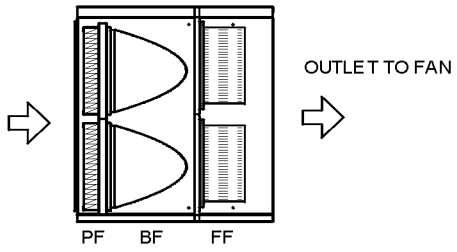


SAMPLE C-TPF CONFIGURATIONS

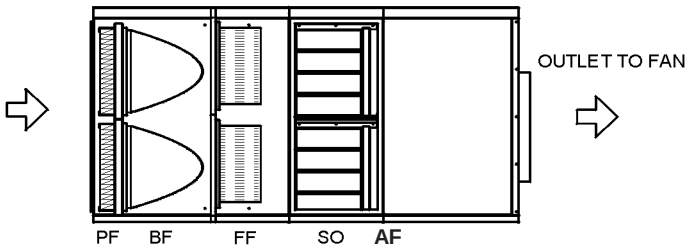
The C-TPF unit is available in sizes ranging in capacity from 1000 to 32,000 CFM (472 to 15,102 L/s). Each unit is equipped with Three Phase Filters for smoke control, and may include an exhaust fan, odor abatement equipment and Quencher System, or Ansul System as an option. The following illustrations are examples of the most common configurations.

KEY

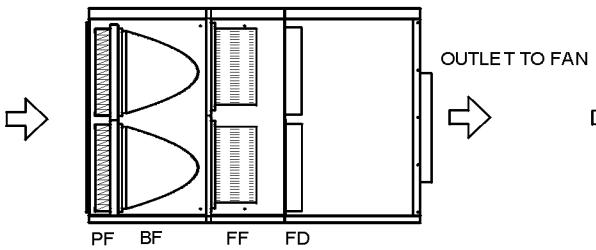
AF	= 30% After Filter	FD	= Optional Curtain Fire Damper
BF	= 95% Bag Filter	FF	= 99% Final Filter
DO	= Double Pass Odor Kor48/Carbon blend	PF	= 30% Pre-Filter
EF	= Exhaust Fan–un-housed	SO	= Single Pass Odor Kor48/Carbon blend
EFH	= Exhaust Fan–housed	SPO	= Spray Odor Cabinet



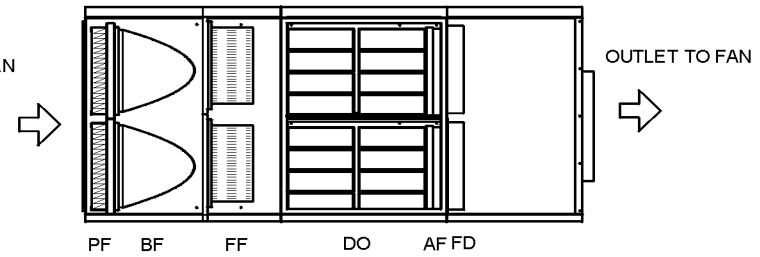
C-TPF
SMOKE CONTROL ONLY



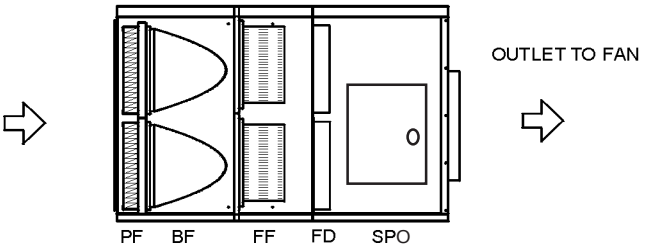
C-TPF-SO
SMOKE CONTROL
WITH SINGLE PASS MEDIA BED ODOR CONTROL



C-TPF
SMOKE CONTROL
WITH PLENUM



C-TPF-DO
SMOKE CONTROL
WITH DOUBLE PASS MEDIA BED ODOR CONTROL AND
OPTIONAL FIRE DAMPER



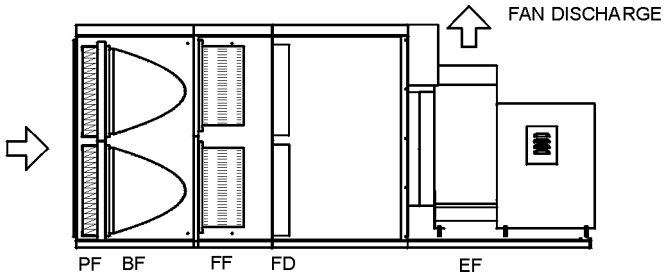
C-TPF-SPO
SMOKE CONTROL WITH SPRAY ODOR CONTROL
AND OPTIONAL FIRE DAMPER
(Remote Fan)

SAMPLE C-TPF CONFIGURATIONS

KEY

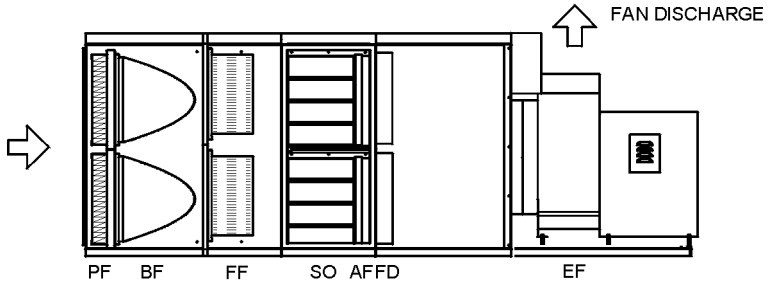
AF	= 30% After Filter	FD	= Optional Curtain Fire Damper
BF	= 95% Bag Filter	FF	= 99% Final Filter
DO	= Double Pass Odor Kor48/Carbon blend	PF	= 30% Pre-Filter
EF	= Exhaust Fan—un-housed	SO	= Single Pass Odor Kor48/Carbon blend
EFH	= Exhaust Fan—housed	SPO	= Spray Odor Cabinet

C-TPF-EF



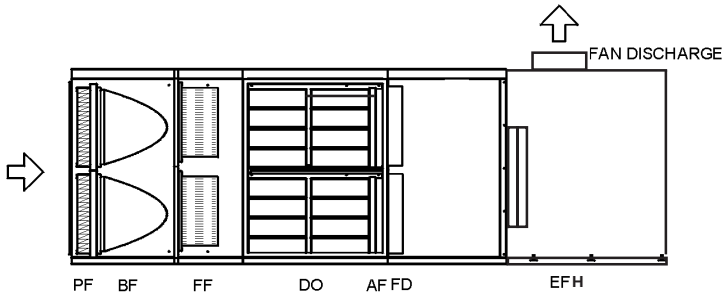
SMOKE CONTROL WITH EXHAUST FAN AND OPTIONAL FIRE DAMPER

C-TPF-SO-EF



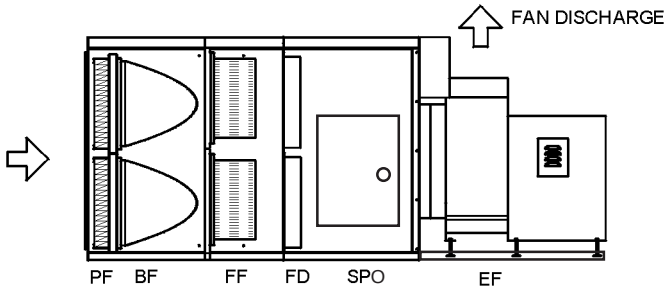
SMOKE CONTROL WITH SINGLE PASS MEDIA BED ODOR CONTROL, EXHAUST FAN AND OPTIONAL FIRE DAMPER

C-TPF-DO-EFH



SMOKE CONTROL WITH DOUBLE PASS MEDIA BED ODOR CONTROL, EXHAUST FAN AND OPTIONAL FIRE DAMPER

C-TPF-SPO-EF



SMOKE CONTROL WITH SPRAY ODOR CONTROL, EXHAUST FAN AND OPTIONAL FIRE DAMPER

RECEIVING & INSTALLATION

RECEIVING

Most C-TPF units are shipped in one piece. However, some units, because of size or special jobsite conditions, may be shipped in multiple sections. Follow the instructions provided with the unit to join sections back together. If the unit includes media bed odor control, the KOR48/carbon odor control media is packaged separately. Verify against the shipping documents that you have received all items and note any shipping damage, obvious or hidden, to your carrier and on your Bill of Lading. If damage is found, immediately file a claim with the transport company. All units are thoroughly inspected and fully operation tested at the factory prior to shipment.

Verify that the electrical and air flow ratings on the unit name plate agrees with jobsite requirements. If a contradiction arises notify the factory prior to proceeding with installation.

SAFETY CONSIDERATIONS

Installing and servicing the unit can be hazardous due to the presence of electrical components. Only trained and qualified service personnel should install or service this equipment.

Untrained personnel can perform basic maintenance, such as cleaning and replacing filters. All other operations should be performed by trained service personnel. When installing or servicing, observe precautions in literature and on tags and labels attached to unit.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly.

WARNING

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Electrical shock can cause personal injury or death.

RIGGING

All units are provided with a minimum of four (4) lifting points for rigging attachment. WARNING: Use all lifting points provided. (Refer to Page 13) Spreader bars are mandatory to prevent contact and damage to the unit by lifting hooks, straps, cables, or chains. Consult the mechanical or structural engineer before moving the unit across the roof deck.

INSTALLATION CODES

This unit requires external plumbing and electrical connections to be made in the field. It is recommended that the Authority Having Jurisdiction (AHJ) be consulted regarding local codes and installation procedures. Captive-Aire Systems is not responsible for obtaining necessary approvals and permits which may be required for installation, nor is it responsible for verifying that the unit has been installed in accordance with national, state, and local codes. In the absence of locally adopted codes use the latest editions of the national electrical code and the uniform mechanical code. Connections of the exhaust duct to the inlet and outlet of the C-TPF unit must be fully welded to comply with NFPA-96.

INSTALLATION PRECAUTIONS

1. The services of qualified contractors are essential for safe and proper installation of this equipment.

2. The air volumes and external static pressures that are listed on the unit are for the middle of the operating range of the filters. The initial air volume should be at least 10% higher than the listed CFM. As the filters load up the air volume will drop. This is inherent to this type of unit. If the unit is set up at or below the design CFM, as the filters load up, the kitchen hood may experience smoke loss problems. Please consult the factory if you have questions.

3. The unit is designed for installation on a level surface.

4. When installed in an enclosed space a fire rated enclosure may be required for the unit and associated duct work. Consult the Authority Having Jurisdiction.

5. Consult the Authority Having Jurisdiction regarding requirements covering the point of termination of the exhaust outlet of this unit. Minimum distances must usually be maintained between the exhaust outlet and any outside air intakes and/or adjacent structures or property lines.

6. Do not apply power to the unit until all electrical connections have been made and a pre-start-up preliminary inspection has been completed.

7. Allow a minimum of 36 inches clearance in front of the filter access door and electrical compartment door for service and routine maintenance.

SHORT TERM STORAGE

Units that include media bed odor control are provided with KOR48/carbon media which is shipped separate from the unit. KOR48/carbon media must be stored in a dry place with less than 95% relative humidity.

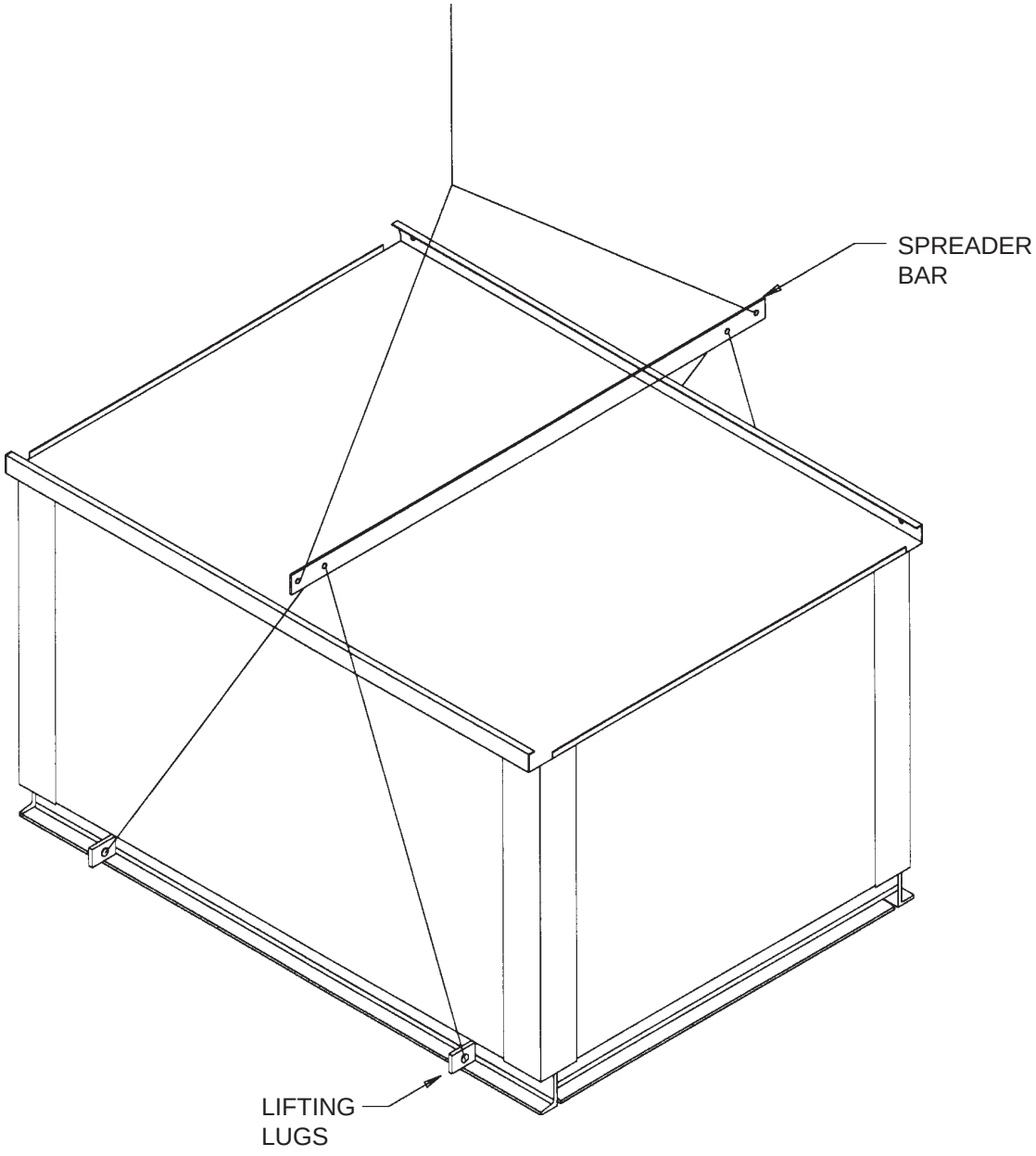
LONG TERM STORAGE (OVER ONE MONTH)

If the unit is equipped with an exhaust fan it must be relubricated as soon as it arrives. To prevent corrosion all bearings should receive grease and be rotated the first of every month. Turn the wheel by hand while greasing bearings. A clean 1/16" bead of grease must appear on each side of each bearing. Refer to specific bearing lubricating instructions on the fan. Also, refer to bearing lubricating instructions found in the exhaust fan section of this manual.

Bearings which are to be stored or idle for an extended period of time should be wrapped in a neutral grease-proof paper, foil, or plastic film. Compounds can be ecommended by the bearing manufacturer to provide protection for several months to several years.

After long-term storage, grease should be purged from the

EQUIPMENT LIFTING PROCEDURE



1. All units are provided with a minimum of four lifting points for rigging attachment. All lifting points must be used.
2. Spreader bars are mandatory to prevent contact and damage to the unit by lifting hooks, straps, cables or chains.

HOUSING ASSEMBLY INSTRUCTIONS

1. Attach "TPF Section" to "Media Bed Odor Control Section":

Bolt "TPF Section" and "Media Bed Odor Control Section" bases together on outside of unit, using 3/4" holes. Tek screw walls and roofs together, using 3/16" holes. Continuously weld: floor, wall, and roof seams from inside of unit.

2. Attach "Media Bed Odor Control Section" to "Plenum Section" (if applicable):

Bolt "Media Bed Odor Control Section" and "Plenum Section" bases together on outside, using 3/4" holes. From inside plenum, tek screw walls and roofs together, using 3/16" holes. Continuously weld: floor, wall, and roof seams from inside of unit.

3.Attach Fan Inlet to "Plenum Section" outlet:

Push "Exhaust Fan Section" about 7" from "Plenum Section". Tek screw & caulk fan duradyne to plenum interconnect ring, at 5" intervals (minimum). Duradyne is preattached to fan inlet side.

4. Attach "Plenum Section" to "Exhaust Fan Section":

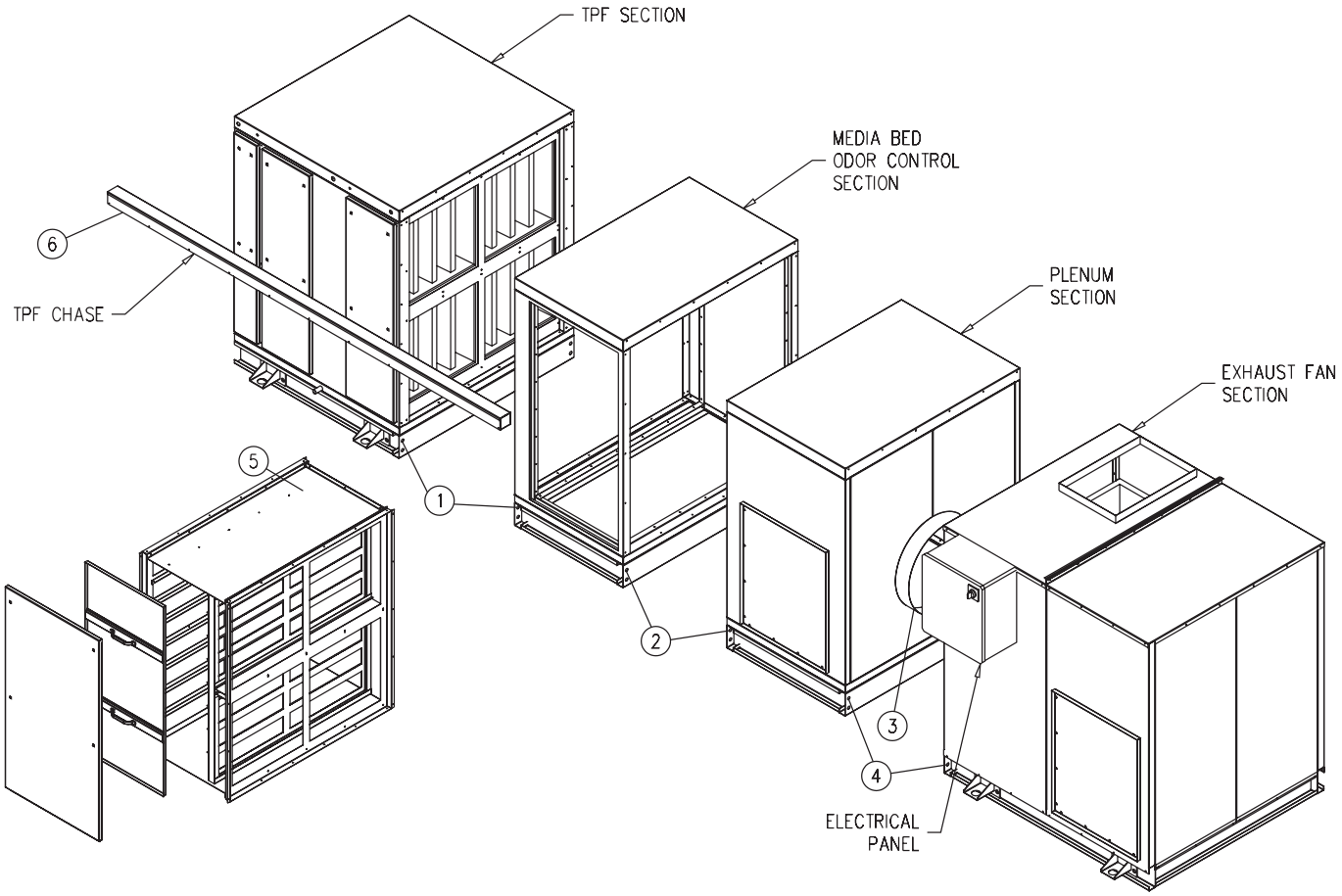
Bolt "Plenum Section" and "Exhaust Fan Section" bases together on outside, using 3/4" holes. From inside of plenum, tek screw walls and roofs together, using 3/16" holes. Continuously weld floor seam from inside plenum. "Exhaust Fan Section" walls and roof to remain removable for exhaust fan replacement, tek screw and bolt only.

5. Assemble "Media Bed Odor Control Section" (if applicable):

Refer to "Media Bed Odor Control Section assembly instructions" drawing".

6. Attach "TPF Chase"

Bolt "TPF Chase" to rest of assembled unit. Connect Pressure tubing from sensors 1-4 to Pressure Switches 1-4 in the "Electrical Panel", refer to Pressure Switch Tubing Diagram on page 26. Connect Thermostat wires from Thermostat to Electrical Panel, refer to Wiring Diagram on page 29.



MEDIA BED ODOR CONTROL SECTION ASSEMBLY INSTRUCTIONS

NOTE: Assemble this section, only after the rest of the unit has been assembled.

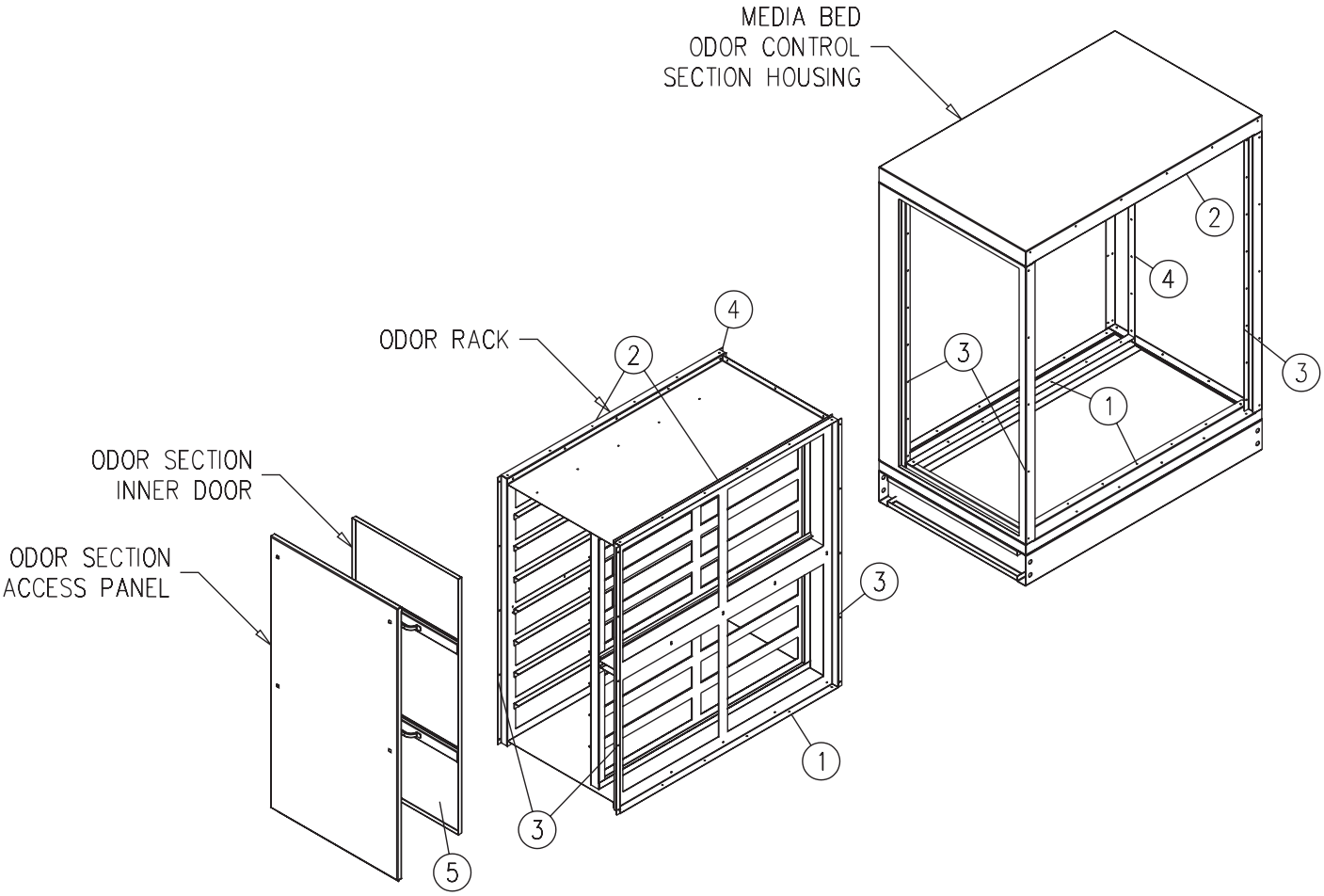
1. Slide Odor Rack into unit through door opening. Tek screw rack to floor rails, using $^{3}/_{16}$" holes.

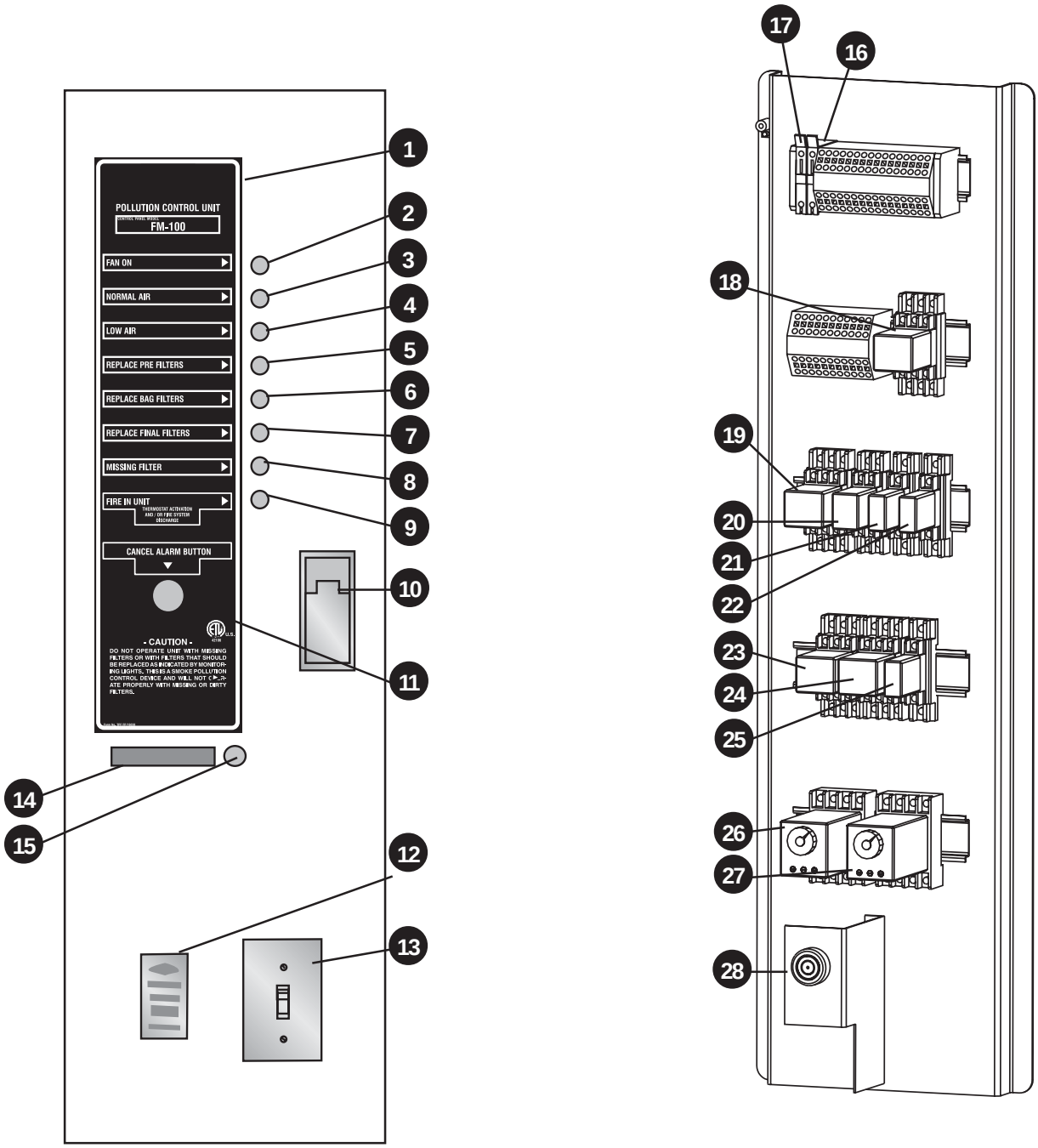
2. Tek screw upper rack to both sides of roof rails.

3. Tek screw first 3 sides to mounting rails from outside of the unit.

4. Attach fourth side by entering odor rack to reach screw holes.

5. Attach Odor Section Inner Door, flip latches to secure.





FILTER MONITORING STATION
MODEL CFM-100

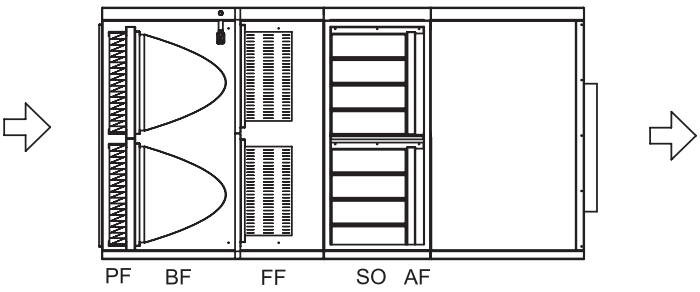
PARTS – CFM-100 MONITOR PANEL

FM-100 Component Schedule				
Item No.	**Wiring Tag**	**Description**	**Size**	**Part No.**
Mounted on FM-100 Door				
1		ClearAir FM-100 Control Label		19038
2	LT1	Indicator Light - Green	120 VAC	30526
3	LT1	Indicator Light - Green	120 VAC	30526
4	LT3	Indicator Light - Clear	120 VAC	18178
5	LT3	Indicator Light - Clear	120 VAC	18178
6	LT3	Indicator Light - Clear	120 VAC	18178
7	LT3	Indicator Light - Clear	120 VAC	18178
8	LT2	Indicator Light - Red	120 VAC	30527
9	LT2	Indicator Light - Red	120 VAC	30527
10		Lift & Turn Compression Latch		11119
11	SW2	FM-100 Cancel Switch		19076
12		C-150 Switch Label		18644
13	C-150	C-150 Start/Stop Switch	SPST	18314
Optional - Spray Odor Low Chemical Light				
14		Low Odor Control Chem. Label		19154
15	LT2	Indicator Light - Red	120 VAC	30527
Mounted on FM-100 Back board				
16	FU2	Fuse - Main	6.3 Amps	17061
17	FU3	Fuse - Spray Odor	6.3 Amps	17061
18	CR1	Control Relay	TPDT	11403
		Socket	TPDT	11418
19	CR2	Control Relay	TPDT	11403
		Socket	TPDT	11418
20	CR3	Control Relay	DPDT	10283
		Socket	DPDT	10295
21	CR4	Control Relay	SPDT	11399
		Socket	SPDT	11413
22	CR5	Control Relay	SPDT	11399
		Socket	SPDT	11413
23	CR6	Control Relay	TPDT	11403
		Socket	TPDT	11418
24	CR7	Control Relay	TPDT	11403
		Socket	TPDT	11418
25	CR8	Control Relay	SPDT	11399
		Socket	SPDT	11413
26	TR1	Timing Relay - On Delay	DPDT	30375
		Socket	8-pin	30376
27	TR2	Timing Relay - On Delay	DPDT	30375
		Socket	8-pin	30376
28	AL1	Sonalert	120 VAC	30528

ODOR CONTROL SECTION – MEDIA BED TYPE

General Description

C-TPF units that include media bed odor control have an "SO" suffix for single pass and "DO" suffix for double pass odor control in the model number. Refer to the nameplate on the unit (see page 24 for sample). As shown in the illustration below, the odor control section consists of two major components: Odor control media and 30% after filters.



Odor Control Media (bed type)

The odor control media furnished with your C-TPF unit is either a product trade named KOR48/Carbon Blend manufactured by Cameron/Great Lakes, Inc. of Portland, Oregon. KOR48/Carbon Blend is made from a unique 50% aluminosilicate compound impregnated with 6% potassium permanganate and 50% activated carbon or 100% activated carbon.

The granules are approximately .10 inch in diameter and are poured into metal modules (see page 19) which slide into racks in the odor control section of the unit. As the air is drawn through the modules, the KOR48 the media oxidizes the lighter odor molecules and chemically changes them into harmless solids which remain in the media and the carbon absorbs the heavier odor molecules. This combination provides very effective odor control. The 100% carbon is lower cost alternative that must have fire suppression system installed to protect it as it is flammable. This material absorbs odor and will gradually decrease in effectiveness until it starts to release the odors it has absorbed.

The life of the odor control media is dependent upon several factors such as the type of odor, amount of odor molecules, grease loading and air temperature. KOR48 media has a flat efficiency curve - meaning that the efficiency, or effectiveness, stays constant until the media has expended and then the efficiency drops off rapidly. The carbon portion of the media's efficiency drops continually during its life. Thus a regular schedule of change out needs to be established and followed.

Filters

Smoke control filters in the odor control section of the system requires the replacement prior to them becoming loaded. It is recommended that the filters be inspected in accordance with the "Odor Control Media Inspection Frequency Chart" on this page, and replaced if necessary. The following chart provides data for ordering filters.

Service and Maintenance

The KOR48/ carbon media is deep purple in color when new, turning to a dark brown during use and light tan when expended. Carbon media is black at the time of delivery. It is recommended that both medias be checked in accordance with the table below.

The C-TPF unit incorporates an "Odor Control Media Monitoring Tube" to facilitate inspection (refer to page 19). Using an open end wrench, turn the tube nut counter clockwise and remove the monitoring tube assembly. If the KOR48/ Carbon media is dark brown, break a granule open and if the inside is light tan there is very little life left and it should be replaced. If the outside of the granules are light tan the media is completely expended and must be replaced. If you are unable to determine the status send a small sample, one teaspoon, to Cameron Great Lakes noting the date of installation. They will conduct a life test and advise the results by fax or phone within 2 days of receipt. For further details contact Cameron Great Lakes .

Cameron Great Lakes
2335 NW 29th
Portland, OR 97210
800-777-4044
630-377-0711

The label next to the monitoring tube includes an area where the date of initial fill and the date of inspection can be filled in with a grease pencil.

ODOR CONTROL MEDIA INSPECTION FREQUENCY CHART

TYPE OF COOKING EQUIPMENT	FREQUENCY IN DAYS
LIGHT DUTY ..... Ovens, steamers, and kettles	**120**
MEDIUM DUTY ..... Braising pans/Tilting skillets, fryers, griddles, grooved griddles, open burner ranges, hot top ranges, and conveyor ovens	**90**
HEAVY DUTY ..... Gas and electric char broilers, upright broilers, woks and conveyor broilers	**60**
EXTRA HEAVY DUTY ..... Solid fuel broilers	**30**

Replacing the Media
There are two methods of replacing the media, the "Advancing Program" or Site Refill.

Advancing Program - This is a program offered by Cameron/Great Lakes, Inc. where they will ship recycled pre-filled modules in exchange for used modules. The pre-filled modules are shipped two to a box, box size 25" x 25" x 13", which weigh approximately 90 lbs. The boxes are palletized, 36 to a pallet, and are shrink wrapped. Three primary advantages of the "Advancing Program" are: 1) virtually no requirement for storage except for the short period of time needed to switch the new modules for the expended ones 2) minimizes unit down time and 3) avoids filling on site.

To participate in the "Advancing Program" proceed as follows:

1. Contact the local Cameron/Great Lakes distributor and order the number of modules required.

2. Upon receipt, remove the depleted modules and replace with the new modules.

3. Empty the media from the depleted modules into containers for disposal.

4. Pack the empty used modules into the boxes the new ones came in and ship back to the distributor.

5. Fill the media monitoring tube with new media and mark the date on the monitoring tube label.

Site Refill - Site refill involves the purchase and storage of new media, emptying and refilling the modules and disposing of the spent media. New media may be purchased from your local Cameron Great Lakes distributor. For the name and phone number of the local distributor call Cameron/Great Lakes.

New media comes in standard five gallon buckets which weigh 40 lbs each. One bucket will refill approximately 1.33 modules. It is recommended that new media is purchased no more than 2 weeks in advance of its use. The buckets should be protected against physical damage as KOR48/carbon will begin to oxidize any odor molecule when exposed to atmosphere. The buckets should be stored in a cool dry area.

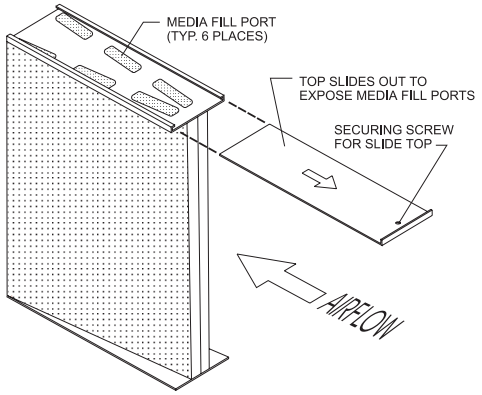
Removing the Modules
Caution - each module weighs approximately 30 lbs. and may be awkward to handle particularly in the upper racks. It is highly recommended that a heavy duty steel wheeled ladder be used when removing the upper modules.

Caution - Exhaust fan must be off before opening the odor control media access door.

Refilling the modules is a relatively simple task not requiring any special tools. Follow steps 1-11:

Step 1. Set the module on end so the securing screw is on top.

Step 2. Remove the securing screw and slide the cover plate off.



Step 3. Place the filling jig over opening.

Step 4. Pour the media into the module.

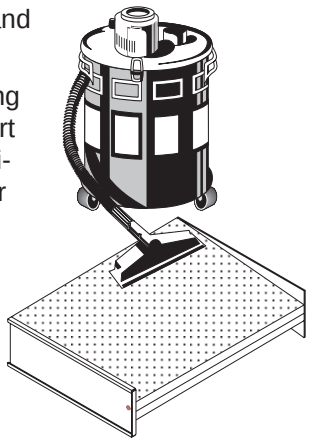
Step 5. To eliminate voids, shake or vibrate the module to ensure that the media settles.

Step 6. Continue adding media until module is full.

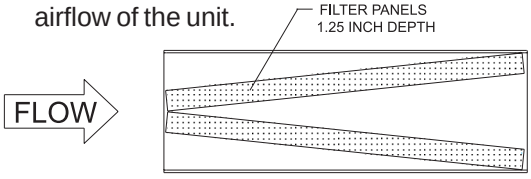
Caution: Do not overfill as it may cause the sides to bulge.

Step 7. Replace cover plate and install securing screw.

Step 8. Optional - some dusting may occur on initial start up of the unit. To minimize this, vacuum or blow out the modules.

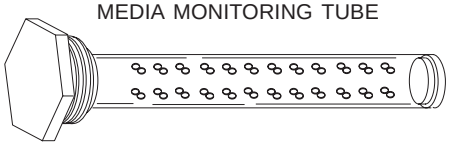


Step 9. Slide the modules back into the rack being cautious that the airflow label is matching the airflow of the unit.



Step 10. Close the odor control media access door.

Step 11. Pour new media into the media monitoring tube and re-install. Record the date on the label.



ODOR CONTROL SECTION – CHEMICAL SPRAY TYPE

The Spray Odor Unit operates on spray-on and spray-off timed cycles while the C-TPF unit is in the “Fan On” mode.

The Spray Odor Control includes two (2) timers, one (1) for the “Cycle Timer” (this is the spray ”OFF” timer) and one (1) for the “Spray Timer” (this is the spray “ON” timer). Both timers are calibrated and can be set between 5 and 600 seconds. The factory/setting is always 15 seconds “ON” and 15 seconds “OFF”.

CYCLE TIMER
To set the “Off” period, turn the dial to the desired off time interval.

SPRAY TIMER
To set the “On” period, turn the dial to the desired on time interval.

AIR PRESSURE
Factory set to 20 PSIG

Electrical Controls
To adjust the spray odor cycle and timers, open the Spray Odor Cabinet, and remove the screwed-in-place timer control cover plate. Adjust as necessary for satisfactory odor control.

CAUTION: Always de-energize the C-TPF before opening the Electrical and Timer Control Panel inside the Odor Spray Cabinet.

SPRAY ODOR CONTROL SPRAY NOZZLE ASSEMBLY

NOZZLE MAINTENANCE
To obtain the best performance from your nozzle, it may become necessary to clean it periodically.

The nozzle may become clogged and cease spraying due to factors such as dust, foreign particles accumulated in the orifice, and/or leakage in the air or liquid section of the nozzle.

The following procedure should be done to maintain the nozzle’s performance:

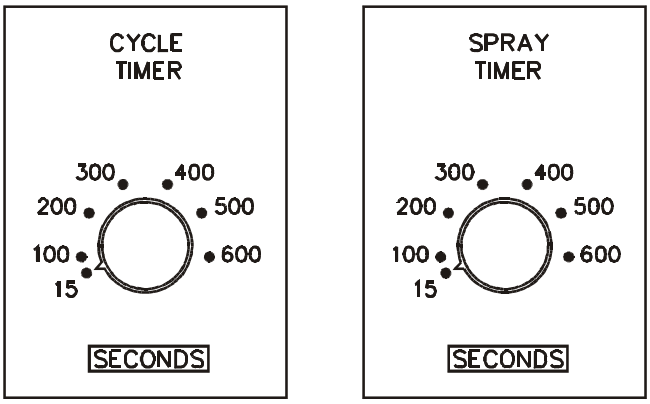
1. Check the air line, which is connected from the compressor unit to the compression fitting and threaded into the air inlet side of the nozzle, for any leakage.
2. Check the liquid suction line, which is connected to the liquid inlet side of the nozzle, and ensure that it is immersed in the odor control solution.
3. If it appears that the nozzle is only blowing air and does not lift up the odor control solution out of the container, do the following:

Remove the cleanout plug from the nozzle body and, using a very thin pin or wire, clean the hole in the fluid cap (orifice) and replace the cleanout plug. Remove the foot valve from the liquid container and inspect screen for clogging. Brush clean if clogged.

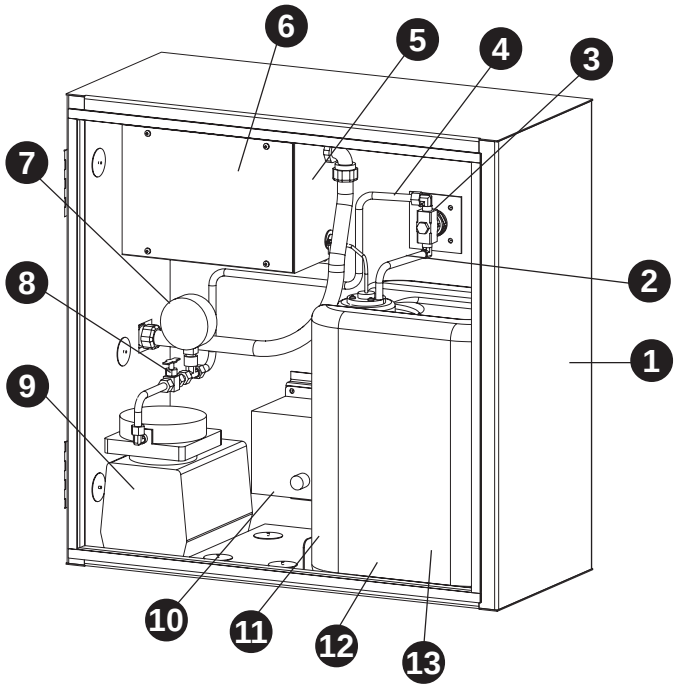
SPRAY ODOR CHEMICAL
In order for the spray odor system to work correctly the system must be supplied with a chemical solution. This solution in conjunction with the delivery nozzle system that finely atomizes the spray is what makes the system work. We recommend the use of **FORMULA GS-710**. This material has been effective at removing between 80% and 90% of the odors from the kitchen exhaust in many applications. For the contact information of the nearest distributor of **FORMULA GS-710:**

Captive-Aire Systems, Inc.
360 Northbrook Drive
Youngsville, NC 27596
Phone: (866) 784-6900
Fax: (919) 554-9374
Website www.captiveaire.com

ODOR CONTROL SECTION – CHEMICAL SPRAY TYPE



CYCLE AND SPRAY TIMER RELAY



Spray Odor Component Schedule		
Item No.	**Description**	**Part No.**
1	Spray Odor Cabinet Assembly (25" x 25")	19119
2	1/4" I.D. Flexible Suction Tube	10272
3	Spray Nozzle Assembly	19065
4	3/8" Copper Tubing	11000
5	Electrical Box	N/A
6	Cycle and Spray Timer Relay	19073
7	Pressure Gauge	10276
8	Needle Valve	19070
9	Air Compressor	19072
10	Heater	19075
11	5 Gallon (18.9 Liter) Container of GS-710	19097
12	Level Sensor for Spray Odor Chemical (In Tank)	19071
13	1/4" Foot Valve (In Tank)	10269

EXHAUST FAN SECTION

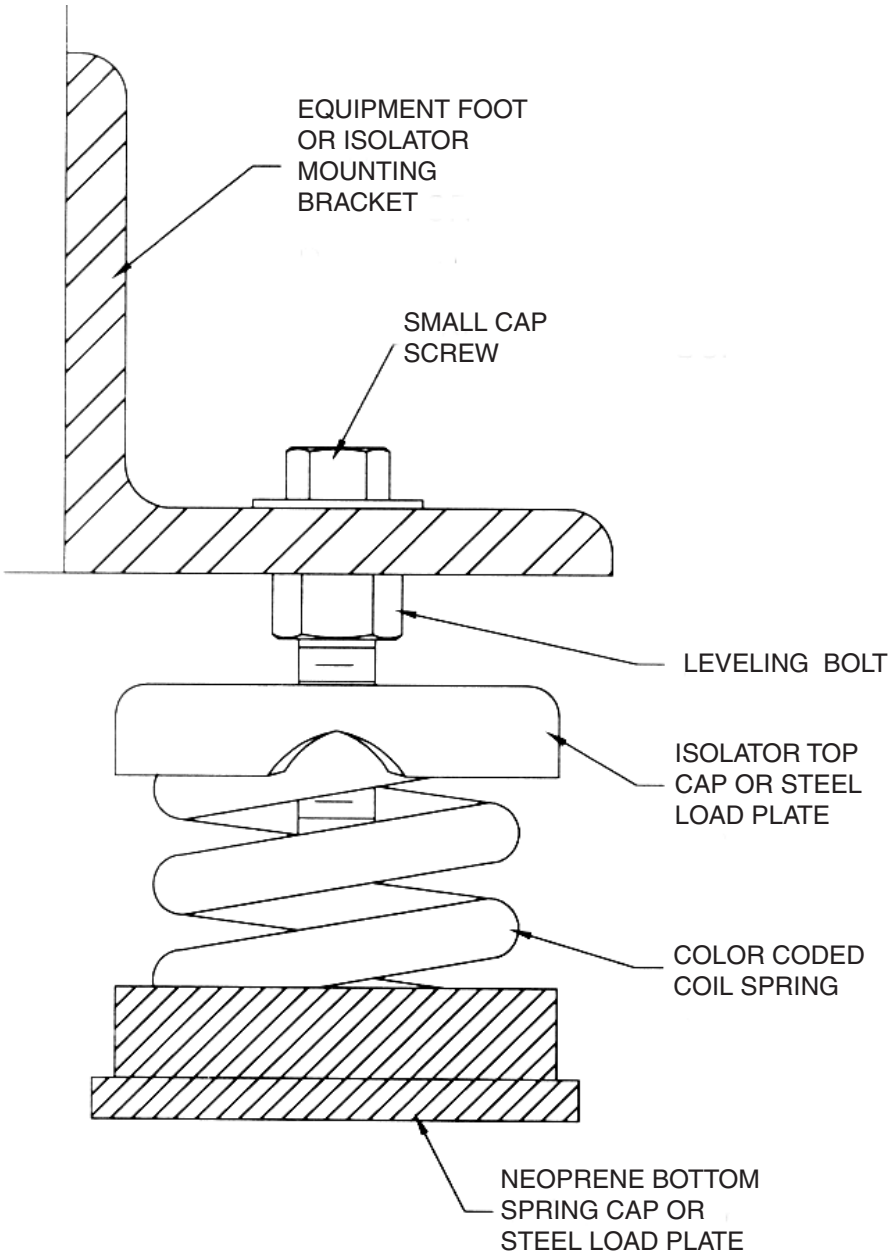
GENERAL

The exhaust fan in the C-TPF Unit is a heavy duty type. The size of the fan, motor, and drives have been chosen for the most efficient operation.

INITIAL SET-UP

For shipping purposes the spring isolators under the fan have been bolted down to prevent movement. To un-bolt and set up the springs properly proceed as follows:

1. Locate the red shipping hold down brackets. These are attached to the fan base and the unit floor.
2. Remove the Tech screws.
3. Check the fan for free movement, making sure that none of the springs is grounded out against a bolt or the unit floor.



IPRE-OPERATIONAL MAINTENANCE

Before starting the exhaust fan perform the following pre-operational maintenance:

1. **Set screws & Belts:**
   a. Rotate fan impeller to check for shifting that may have occured during shipment. If necessary, shift wheel position and re-tighten.
   b. Check belt and pulley alignment.
   c. Check tightness of setscrews in blower wheel hub.
   d. Check tightness of set screws in bearing locking collar.
   e. Check tightness of set screws in motor and fan pulleys.
   f. Check tightness of all frame bolts and base bolts.
   g. Check tightness of bearing mounting bolts.

2. **Belt tension.** Take up or relieve tension in belts so that there is approximately ¾" to 1" deflection under 3 pounds pressure based on 2½ to 3 foot centers on drive. Adjustment of belt tension is accomplished by use of adjustable motor base.

INITIAL FAN LUBRICATION

To prevent corrosion bearings should receive grease and be rotated. Turn the wheel by hand while greasing bearings. A clean 1/16" bead of grease must appear on each side of each bearing. Refer to specific bearing lubricating instructions on the fan.

Bearings which are to be stored or idle for an extended period of time should be wrapped in a neutral grease-proof paper, foil, or plastic film.

After long-term storage, grease should be purged from the bearings and fresh grease injected prior to start-up.

INITIAL OPERATION

After pre-operational checks, unit is ready for operation:
1. Start up blower. Check rotation.
2. If blower impeller is turning in the wrong direction, reverse rotation per instructions furnished by motor manufacturer.

FAN PREVENTIVE MAINTENANCE

Every six months conduct the following maintenance:

1. Check for condition and tension of belts. Replace cracked, glazed or frayed belts. Re-check tension after 48 hours and re-tension if necessary. Do not over-tighten belts or bearing damage may result. Belt should depress its width when pressed firmly inward at midway point between the pulleys and belt should be tight enough to prevent slippage. When replacing worn belt, replace motor pulley if “shoulder” has a worn-in groove.

2. Check fan and motor bearings for possible binding, noise or overheating. Lubricate fan in accordance with instructions on fan housing.

4. Motors generally used are of the sleeve bearing type and require periodic oiling. A good grade of ASE No. 10 lubricating oil should be inserted into the oiler connections on each end of the motor about every two months. Not more than a teaspoonful should be used; over-oiling will result in oil drip.

TROUBLESHOOTING

1. **Reduced Airflow:**
   a. Blower impellers operating in wrong direction.
   b. Belt slippage or belts broken.
   c. Overload, starter cutout.

2. **Noise in Blower:**
   a. Bad bearings.
   b. Loose tie rods or blades.
   c. Blower wheels loose on shaft, wheels rubbing on housing.
   d. Drive pulley loose on shaft.
   e. Foreign object located in blower wheel or blower housing.

Necessary Action - Correct situation found immediately, as continued operation can shorten life of component parts and result in poor airflow and eventual general shut-down of system until needed repair is made.

NAMEPLATE DATA

The C-TPF nameplate is located on the electrical compartment access door of the unit. If inquiring on service or ordering parts, please have model number and serial number available.

SMOKE POLLUTION CONTROL UNIT

MODEL NUMBER

C -TPF -

SERIAL NUMBER

SUITABLE FOR USE WITH CONTROL MODEL NO.

FOR EITHER INDOOR OR OUTDOOR INSTALLATION

CAPTIVE-AIRE SYSTEMS

360 NORTHBROOK DRIVE
YOUNGSVILLE, NORTH CAROLINA 27596

FOR NAME OF THE NEAREST SERVICE AGENCY CALL:

866-784-6900

Or Visit www.captiveaire.com

The Captive-Aire unit Model C-TPF Series is ETL Listed under the category Air Filtering Device, Report #3028598-1

ETL LISTED U.S. 42106

FORM NO. CATPFNP 902/19039

ENGINEERING DATA

FILTER SECTION

CFM

INT. STATIC PRESSURE "W.G.

VOLTS	PHASE	HERTZ	AMPS	WATTS
	1			

MAX. FUSE SIZE AMPS

MAX. BREAKER SIZE AMPS

OPTIONAL FAN SECTION

CFM

TOTAL STATIC PRESSURE "W.G.

EXHAUST FAN POWER CIRCUIT:

VOLTS	PHASE	HERTZ	AMPS
			FLA

MIN. CIRCUIT AMPACITY

MAX. FUSE SIZE AMPS

MAX. BREAKER SIZE AMPS

-CAUTION-

THE FILTER INDICATOR LIGHTS SHOULD BE INSPECTED FREQUENTLY TO ENSURE THAT COLLECTED GREASE IS BEING REMOVED BY THE FILTER. REFER TO THE TECHNICAL MANUAL FOR SPECIFIC INSTRUCTIONS.

C-TPF NAMEPLATE

C-TPF SERIES OPERATING MATRIX

		EXPLANATION OF FILTER MONITORING STATION (FM-100) LIGHTS										
		"FAN ON" LIGHT ON (GREEN)	"NORMAL AIR" LIGHT ON (GREEN)	"LOW AIR" LIGHT ON (RED)	"REPLACE PRE FILTERS" LIGHT ON (CLEAR)	"REPLACE BAG FILTERS" LIGHT ON (CLEAR)	"REPLACE FINAL FILTERS" LIGHT ON (CLEAR)	"MISSING FILTER" LIGHT ON (RED)	"FIRE IN UNIT" LIGHT ON (RED)	"CANCEL ALARM BUTTON" LIGHT ON (RED)	AUDIBLE ALARM SOUNDS	"LOW ODOR CONTROL CHEMICAL LIGHT ON (OPTIONAL) (RED)
C-TPF MODES	NORMAL OPERATION	X	X									
	PRE FILTERS DIRTY	X		X	X					X	X	
	BAG FILTERS DIRTY	X		X		X				X	X	
	FINAL FILTERS DIRTY	X		X			X			X	X	
	MISSING FILTER		X					X		X	X	
	FIRE IN UNIT (THERMOSTAT ABOVE 250°F)								X		X	
	LOW ODOR CONTROL CHEMICAL (OPTIONAL)	X	X									X

Normal Operation: All filters are in place and the static pressure across all of the filters is within normal operating parameters.

The following lights are on:

"Fan On" – green
"Normal Air" – green

Pre Filters Dirty: The Pre Filters are dirty and need to be replaced, the static pressure across the Pre Filters is above normal. An audible alarm will sound. Pressing the red "Cancel Alarm Button" will silence the audible alarm. Please note that the audible alarm will sound each time the Exhaust Fan is started, until the Pre Filters are replaced.

The following lights are on:

"Fan On" – green
"Low Air" – clear
"Replace Pre Filters" – clear
"Cancel Alarm Button"– red

Bag Filters Dirty: The Bag Filters are dirty and need to be replaced, the static pressure across the Bag Filters is above normal. An audible alarm will sound. Pressing the red "Cancel Alarm Button" will silence the audible alarm. Please note that the audible alarm will sound each time the Exhaust Fan is started, until the Bag Filters are replaced.

The following lights are on:

"Fan On" – green
"Low Air" – clear
"Replace Bag Filters" – clear
"Cancel Alarm Button"– red

Final Filters Dirty: The Final Filters are dirty and need to be replaced, the static pressure across the Final Filters is above normal. An audible alarm will sound. Pressing the red "Cancel Alarm Button" will silence the audible alarm. Please note that the audible alarm will sound each time the Exhaust Fan is started, until the Final Filters are replaced.

The following lights are on:

"Fan On" – green
"Low Air" – clear
"Replace Final Filters" – clear
"Cancel Alarm Button"– red

Missing Filter: One of the filters (Pre, Bag, or Final) is missing and needs to be returned in the unit to ensure all of the air is being filtered. The static pressure across all of the filters is below normal. An audible alarm will sound. Pressing the red "Cancel Alarm Button" will silence the audible alarm. Please note that the audible alarm will sound each time the Exhaust Fan is started, until all of the filters are in place.

The following lights are on:

"Fan On" – green
"Missing Filter" – red
"Cancel Alarm Button"– red

Fire in Unit: The thermostat installed in the airflow is above 250°F. The Exhaust Fan shuts off. An audible alarm will sound. The audible alarm cannot be silenced when there is a "Fire in Unit". The audible alarm will continue to sound until the thermostat cools below 250°F.

The following light is on:

"Fire In Unit" – red

Low Odor Control Chemical (Optional): The Spray Odor chemical is low, if unit is equipped with Spray Odor. The Spray Odor Chemical needs be filled. The unit will continue to run normally. There is not an audible alarm for Low Odor Control Chemical.

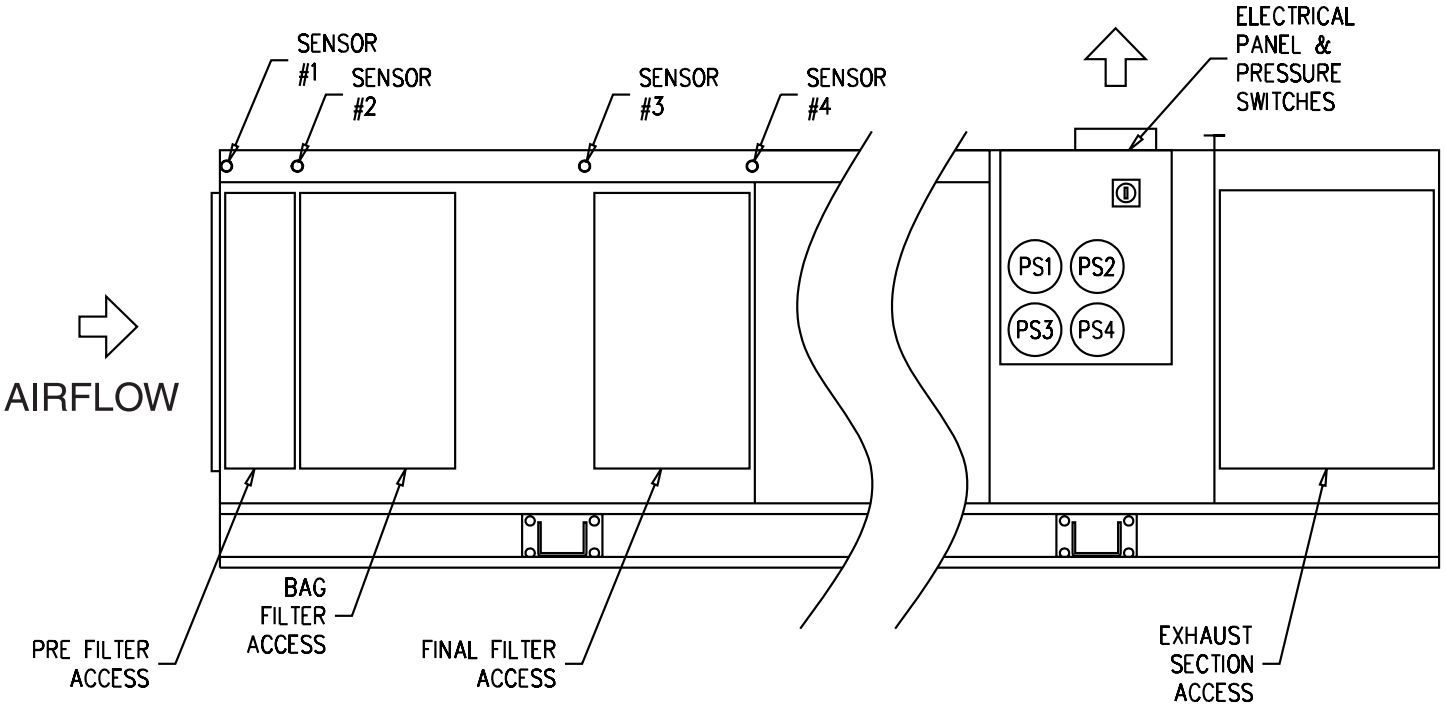
The following lights are on:

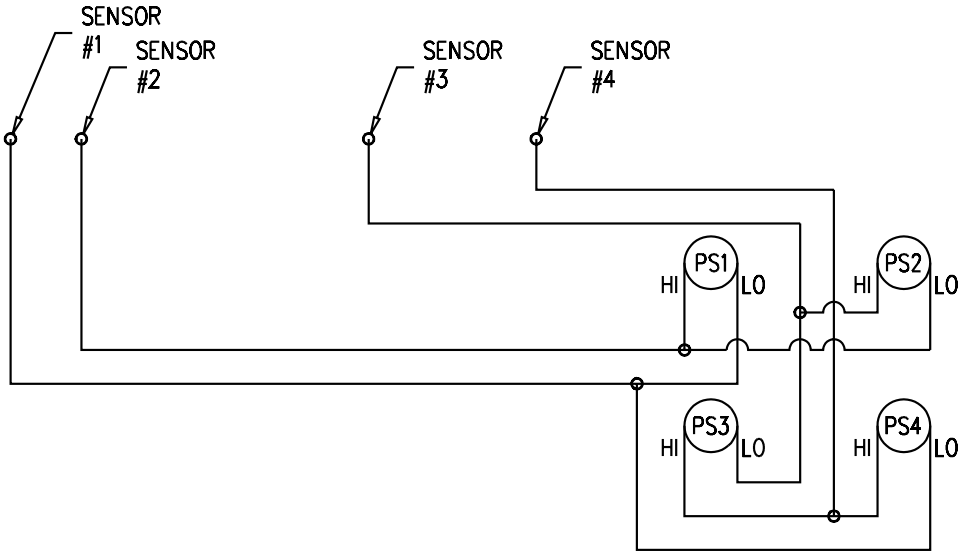
"Low Odor Control Chemical" – red

"Fan On" – green

"Normal Air" – green

C – TPF PRESSURE SWITCH TUBING DIAGRAM





Daily maintenance
The CFM-100 Filter Monitor Station should be checked to see if there are dirty filters. If the indicator lights show a dirty filter (too high of a pressure drop across the filter) they should be replaced. A schedule should be developed based on the operation of this kitchen to replace the filters. See Filter Replacement chart below.

Six Months
Remove the filters and inspect the unit for grease build up. If needed the unit should be cleaned the to the same standards as the grease duct as described in NFPA 96.

Annually
The exhaust fan belts should be checked for wear and tension. If the belt is cracked, frayed, or other wise displaying signs of damage it should be replaced. The fusible links, if the unit has the optional fire dampers, need to be replaced annually per NFPA 96. See Fire Damper across.

Filter Replacement
To achieve maximum smoke removal it is necessary to have clean filters. The indicator lights on the monitor panel will indicate when the filter(s) need to be changed. If the filters are not changed when the monitor indicates, a dirty filter and a lower exhaust air flow rate is occurring at the ventilator. This may result in lower grease extraction efficiency and smoke loss at the ventilator.

The life span of the filters varies greatly based on the amount and type of cooking. The chart below is a starting point and is not to be considered as accurate for cost purposes. Your results will vary.

Approximate number of filter changes per year				
	Light Duty	Medium	Heavy	Extra Heavy
Pre Filter	17	26	52	122
Bag Filter	2	3	6	8
Final Filter	1.5	2	4	6
Odor Control Media bed type	3	4	6	12
Total Filters changed per year	23.5	35	68	148

Filter Replacement
To replace the filters perform the following.

1. Shut off the fan
2. Open the filter access doors
3. Look at how the filters are installed to prevent air bypassing the filters.
4. Remove the clamps on the final filters
5. Remove all filters by sliding out along the lower filter rack
6. Insert the new filters by sliding in along the lower filter rack. Seat properly along the filter bypass gasket. Replace all filters in this way. Lock the final filters in place with the filter clamp.
7. Make sure that the filter pressure switch air tubes connections have not been disturbed by opening the electrical chase and inspecting.
8. Close all access doors and lock all latches.
9. Start fan.

Fire Damper
The C-TPF unit may be equipped with a fire damper on the outlet side of the final filter. There are fusible links on the dampers that will sense a fire. Replace with a 280°F (138°C) link of the same type if they break and the damper closes.

Fuse Link Replacement
1. Open the plenum access door.
2. Remove the defective link.
3. Replace with a new link by wrapping the link support across the blades and securing at the clip on the other side of the frame.
4. Replace the plenum access doors
5. Start the fan.

Pressure Switch Adjustments
The pressure switches have been set at the factory, except missing filter which needs to be field adjusted.

1. Remove the electrical chase and the front cover of the switch.
2. Turn the adjusting screw as needed to set the switch.
3. Replace the cover and the electrical chase cover.

Pressure Switch Settings
1. “Pre Filter” (PS1) .50” W.G. (.124 KPA)
2. “Bag Filter” (PS2) 1.25 W.G. (.310 KPA)
3. “Final Filter” (PS3) 2.00 W.G. (.497 KPA)
4. “Missing filter” (PS4) turn overall pressure switch fully clockwise. Start fan and turn adjusting screw counter clockwise until fan shuts off, Adjust set screw clockwise ½ turn.

Missing Filter Test
To test the filter missing monitor

1. Open the filter access and remove 1 final filter.
2. Close the access and restart the units
3. Start fan.
4. The audible alarm will sound, the "Missing Filter" light and the "Cancel Alarm Button" light will illuminate. To silence audible alarm, press the "Cancel Alarm Button". Both lights will stay lit.
5. Replace the final filter and restart unit. The audible alarm should stop,and the "Missing Filter" and "Cancel Alarm Button" lights will turn off.

CFM-100 TERMINAL VOLTAGES

TERMINAL	DESCRIPTION	FAN OFF	FAN ON	INT. FIRE
L1	Main Power Connection : Hot	120 VAC	120 VAC	120 VAC
L2	Main Power Connection : Neutral	Common		
31	Output to Supply Fan Motor Starter	0 VAC	120 VAC	0 VAC
33	Thermostat Return	0 VAC	0 VAC	120 VAC
34	Fused Supply to Press. Sw. & T-Stat.	120 VAC	120 VAC	120 VAC
35	120 VAC Neutral Leg	High Voltage Common		
36	Spray Odor Power	0 VAC	120 VAC	0 VAC
38	Output to Exhaust Fan Motor Starter	0 VAC	120 VAC	0 VAC
P1	Pressure Switch #1 - Pre-Filters	0 VAC	See Note 1	0 VAC
P2	Pressure Switch #2 - Bag Filters	0 VAC	See Note 2	0 VAC
P3	Pressure Switch #3 - Final Filters	0 VAC	See Note 3	0 VAC
P4	Pressure Switch #4 - Missing Filter	0 VAC	See Note 4	0 VAC
RF1 RF2	Remote On/Off Switch Terminals for C-TPF	N/A	N/A	N/A
SF3 SF4	N.O. Dry Contacts for Supply Fan Remote Control Center	Open	Closed	Open
EF3 EF4	N.O. Dry Contacts for Exhaust Fan Remote Control Center	Open	Closed	Open
A11 A12	N.O. Dry Contacts for Interface to Building Fire Alarm / Monitor System	Open	Open	Closed
Q11 Q12	N.C. Dry Contacts for Interface to Fire System Fuel Shutoff Control	Closed	Closed	Open
LC	Low Chemical (if unit has Spray Odor)	See Note 5	See Note 5	See Note 5

Notes

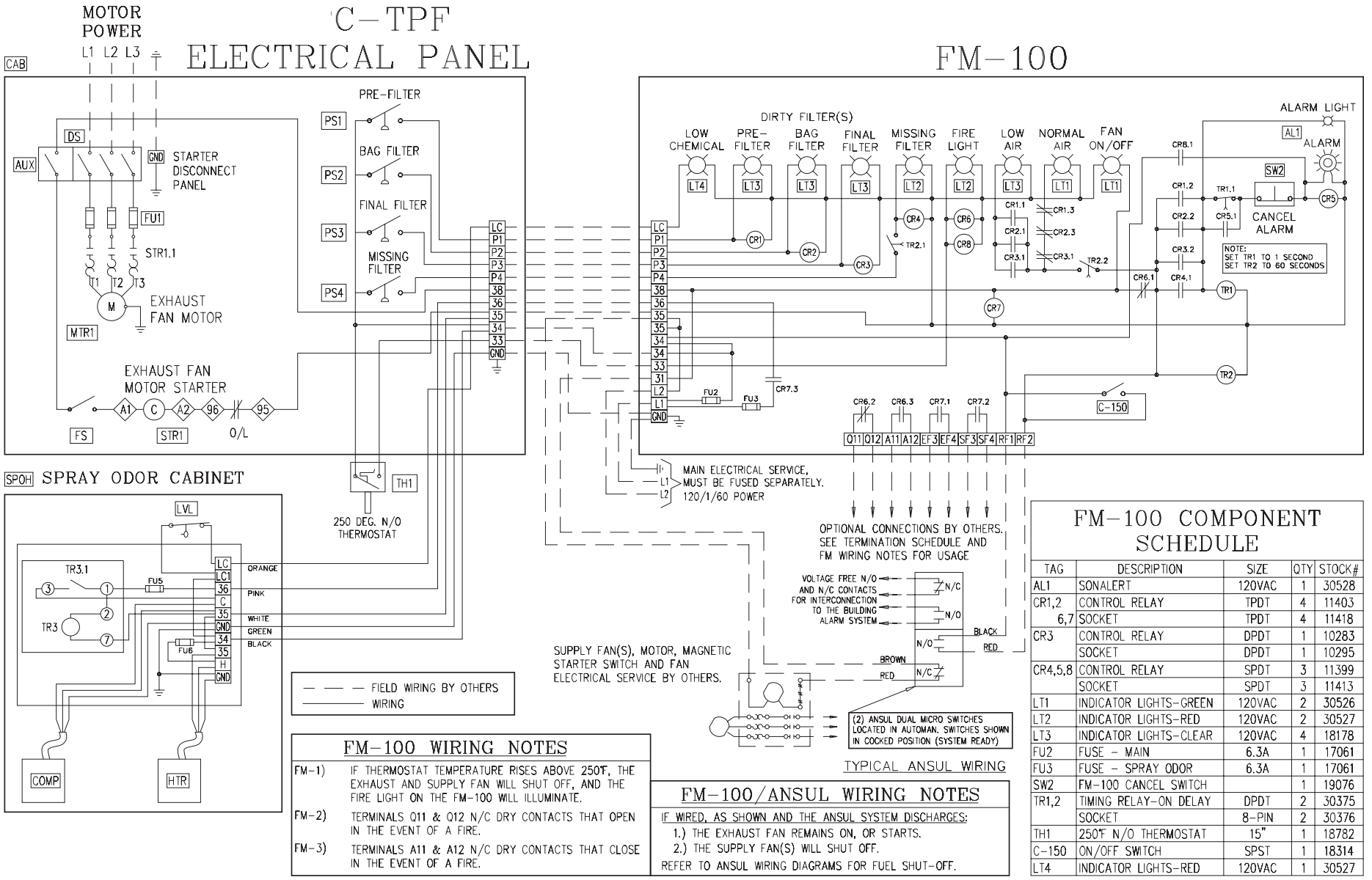
(1) Measures **HIGH** Pressure, when Filters are Dirty - **120 VAC** when **Pressure is HIGH** & **Fan is On**

(2) Measures **HIGH** Pressure, when Filters are Dirty - **120 VAC** when **Pressure is HIGH** & **Fan is On**

(3) Measures **HIGH** Pressure, when Filters are Dirty - **120 VAC** when **Pressure is HIGH** & **Fan is On**

(4) Measures **LOW** Pressure, when a Filter is Missing - **120 VAC** when **Pressure is LOW** & **Fan is On**

(5) Measures **LOW** Chemical - **120 VAC** when **Chemical is LOW (anytime)**



FM-100 WIRING NOTES

FM-1) IF THERMOSTAT TEMPERATURE RISES ABOVE 250°F, THE EXHAUST AND SUPPLY FAN WILL SHUT OFF, AND THE FIRE LIGHT ON THE FM-100 WILL ILLUMINATE.

FM-2) TERMINALS Q11 & Q12 N/C DRY CONTACTS THAT OPEN IN THE EVENT OF A FIRE.

FM-3) TERMINALS A11 & A12 N/C DRY CONTACTS THAT CLOSE IN THE EVENT OF A FIRE.

FM-100/ANSUL WIRING NOTES

IF WIRED, AS SHOWN AND THE ANSUL SYSTEM DISCHARGES:

1.) THE EXHAUST FAN REMAINS ON, OR STARTS.

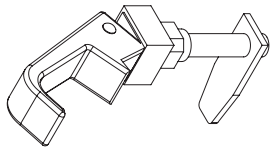
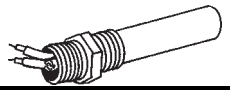
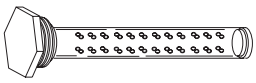
2.) THE SUPPLY FAN(S) WILL SHUT OFF.

REFER TO ANSUL WIRING DIAGRAMS FOR FUEL SHUT-OFF.

FM-100 COMPONENT SCHEDULE

TAG	DESCRIPTION	SIZE	QTY	STOCK#
AL1	SONALERT	120VAC	1	30528
CR1,2	CONTROL RELAY	TPDT	4	11403
6,7	SOCKET	TPDT	4	11418
CR3	CONTROL RELAY	DPDT	1	10283
	SOCKET	DPDT	1	10295
CR4,5,8	CONTROL RELAY	SPDT	3	11399
	SOCKET	SPDT	3	11413
LT1	INDICATOR LIGHTS-GREEN	120VAC	2	30526
LT2	INDICATOR LIGHTS-RED	120VAC	2	30527
LT3	INDICATOR LIGHTS-CLEAR	120VAC	4	18178
FU2	FUSE - MAIN	6.3A	1	17061
FU3	FUSE - SPRAY ODOR	6.3A	1	17061
SW2	FM-100 CANCEL SWITCH		1	19076
TR1,2	TIMING RELAY-ON DELAY	DPDT	2	30375
	SOCKET	8-PIN	2	30376
TH1	250°F N/O THERMOSTAT	15"	1	18782
C-150	ON/OFF SWITCH	SPST	1	18314
LT4	INDICATOR LIGHTS-RED	120VAC	1	30527

PARTS - MISCELLANEOUS

DESCRIPTION	PART NUMBER	ILLUSTRATION
Lift And Turn Latch	11118	
Thermostat 12" Length 250°F N.O.	18781	
30% Pre Filter	30074	
90% Bag Filter	30515	
95% Final Filter	30514	
30% After Filter	30072	
Media Tester	30644	
Pressure Switch	30524	

C - TPF STARTUP INSTRUCTIONS

Start up Procedure for RSCP-TPF

Check duct work for proper connection to unit. All incoming duct work should be minimum 18 GA SS or 16 GA BI and fully welded or joined per NFPA 96 requirements

Check the fan section and remove shipping braces if supplied per the instructions on pages 22 and 23

If the unit was shipped in sections. Check for proper assembly of the unit on pages 14 and 15. All field joints must be welded grease and water tight.

Check for proper and complete installation of all filters. If some are missing locate them and install per the instructions on page 27.

If a media bed odor control system was provided make sure that it was installed per the instructions on pages 18 and 19.

If a spray odor system was provided, locate the 5 gallon pail of GS-710 provided in the spray odor control cabinet. Remove the lid and install the pick up tube and level sensor. For field adjustments refer to pages 20 and 21.

Check for proper air flow at the kitchen hood. Make sure that all access panels have been installed in the duct work and all filters or cartridges are in place in the hood. Check for proper air volume per hood manufacturers instructions. Minimum flow should be the design volume. However, flows of up to 15% high are acceptable. The air flow will drop as the filters become dirty. Starting high will assure smoke capture even with filter loading.

Air volumes of 30 to 50% of design or a strong vibration may indicate that the fan is rotating backwards. Verify Fan rotation. If air flow still low or excessive vibration check fan for loose components, duct discharge may be blocked, or access panels open. Excessive vibration may be caused by shipping braces still in place.

Once the proper air flow is set. The missing filter switch needs to be set per the instructions under **"Pressure Switch Adjustments"** Item 4 on page 27. Perform the **Filter Removal Test** to verify operation.

Captive-Aire C-TPF Start-Up Inspection Report

This start-up Report Used For C-TPF Pollution Control Units
One Report Must Be Completed For Each Unit

File Number _____
Job Name _____
Address _____
_____

NAMEPLATE DATA:
Model No _____
Serial No _____
CFM _____

PRELIMINARY CHECKLIST

UNIT EQUIPPED WITH EXHAUST FAN? ☐ Yes ☐ No
UNIT EQUIPPED WITH ODOR CONTROL? ☐ Yes ☐ No

ALL UNITS:

1. ☐ Open all removable access panels including electrical disconnect panel.
2. ☐ Complete a thorough inspection of the unit for any shipping, handling or installation damages and, if any, note under comments.
3. ☐ Verify all Pre Filters are in place.
4. ☐ Verify all Bag Filers are in place.
5. ☐ Verify all Final Filters are in place.
6. ☐ Verify that the spare fuses are provided inside the CFM-100.

IF UNIT EQUIPPED WITH EXHAUST FAN:

7. ☐ Verify that the optional wall insulation is secure and has not loosened in shipment if a housed fan.
8. ☐ Verify that all shipping tiedowns, bolts and braces have been removed from exhaust fan spring isolators.
9. ☐ Verify that the fan floats freely on the spring isolators and the fan wheel turns freely by rotating the pulleys.
10. ☐ Verify that all bearing set collars are tight.
11. ☐ Verify the exhaust discharge is not obstructed or directed toward any structure.
12. ☐ Verify that the spare fan belts are provided inside the fan housing.

IF UNIT IS EQUIPPED WITH MEDIA BED ODOR CONTROL:

14. ☐ Verify all modules are in place and full of odor control media.
15. ☐ Type of odor control media bed ☐ carbon ☐ potassium permanaganate
16. Unit equipped with a fire protection system? ☐ yes ☐ No
    If so, what type? ☐ Sprinkler ☐ Wet Chemical

OPERATIONAL CHECKLIST

TPF SECTION

1. ☐ Close and latch all access doors & panels.
2. ☐ Verify that all circuit breakers are on and power is supplied to the C-TPF.
3. ☐ Place the door disconnect switch in the “On” position.
4. ☐ Turn the “Start Fan” switch on the CFM-100 cabinet on to energize the exhaust fan:
   a. Exhaust Fan start? ☐ Yes ☐ No
   b. "Fan On" light on? ☐ Yes ☐ No

FAN SECTION

2. ☐ Check air flow at kitchen hood and verify air volume is at design or as much as 15% high.
   If not have:
   a. Balancer adjust sheaves on 5 HP and smaller motors
   b. Have balancer change sheaves on 7.5 HP and larger motors

ELECTRICAL PANEL AND FM-100

Once the air flow is correct the missing filter switch needs to be set

1. ☐ Turn the set screw on the #4 pressure switch until the missing filter light comes on.
2. ☐ Back off ¼ turn

SPRAY ODOR (If equipped with)

1. ☐ Locate container of GS-710
2. ☐ Place GS-710 container in the spray odor cabinet
3. ☐ Remove cap and install pickup tube and level switch in container
4. ☐ Verify that both timers are set to 15 seconds
   This may need to be adjusted to maximize the spray odor effectiveness decreasing the delay or increasing the spraying time will improve the effecti veness of the spray odor. Increasing the delay or decreasing the spray time will reduce the effectiveness of the spray odor system.

Date of Inspection: _____

Inspection Witnessed By:
Name: _____
Title: _____
Signature: _____

Inspection Performed By:
Name: _____
Company: _____

Comments

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Distribution: Captive-Aire Systems / Customer / Sales Rep

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THE CAPTIVE-AIRE C-TPF POLLUTION CONTROL UNIT

LIMITED WARRANTY

The Captive-Aire C-TPF[M] Pollution Control Unit is warranted by CAPTIVE-AIRE SYSTEMS, INC., to be free from defects of material and workmanship under normal use when installed, operated and serviced in accordance with factory recommendations.

CAPTIVE-AIRE SYSTEMS, INC.'s obligation under this warranty shall be limited to repairing or replacing at its option any part of said equipment which CAPTIVE-AIRE SYSTEMS, INC.'s examination shall disclose to its satisfaction to be thus defective, for a period of one (1) year from the date of installation provided proper and acceptable evidence of such installation is recorded at the factory, or 18 months from date of shipment whichever occurs first.

CAPTIVE-AIRE SYSTEMS, INC. SHALL NOT BE RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM A BREACH OF THIS WARRANTY.

All replacement parts furnished under this warranty shall be F.O.B. Captive-Aire Systems, Inc., Youngsville, North Carolina. The owner shall pay the necessary freight delivery charges, and necessary labor for removal and installation of parts, and any federal, state or local taxes.

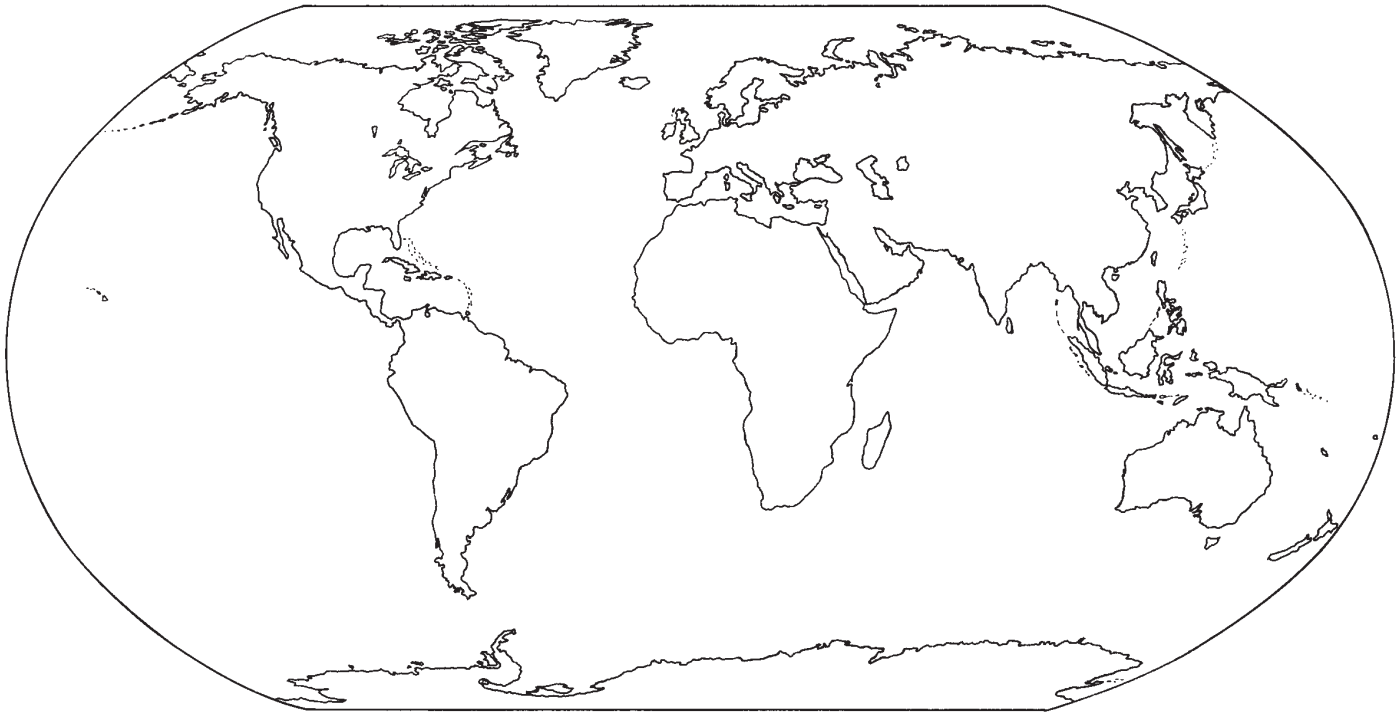
SPECIFIC ITEMS NOT COVERED BY THIS WARRANTY:

1. Fan belts if equipped with an exhaust fan.
2. Pre filters, bag filters, final filters, after filters, and KOR48/carbon media if equipped with odor control.
3. Routine maintenance and cleaning as spelled out in The Captive-Aire Model C-TPF Series Unit Technical Manual.
4. Malfunction or improper operation caused by fluctuating electrical or power surges or improper installation.

This is the sole warranty with respect to the aforesaid items. NEITHER CAPTIVE-AIRE SYSTEMS, INC. NOR ANY OTHER PARTY MAKES ANY OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE AFORESAID OBLIGATIONS ARE HEREBY DISCLAIMED AND EXCLUDED FROM THIS AGREEMENT.

CAPTIVE-AIRE

THE PERFORMANCE COMPANY



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WWW.CAPTIVEAIRE.COM

OR CONTACT US AT:

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1-866-784-6900

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email: webhome@captiveaire.com

LOCAL SERVICE AGENCY

FORM NO. TM CATPF 903/30679

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