



## TJERNLUND PRODUCTS, INC.

1601 Ninth Street • White Bear Lake, MN 55110-6794  
 PHONE (800) 255-4208 • (651) 426-2993 • FAX (651) 426-9547  
 Visit our web site • www.tjernlund.com



MODEL COP2 (For RT-Series Inducers)  
 MODEL COP2DB (For CDB8 Dryer Duct Booster®)

(Includes COP Control and Transducer)

# INSTALLATION INSTRUCTIONS

**!** Recognize this symbol as an indication of important Safety Information!

**OWNER INSTRUCTIONS, DO NOT DESTROY**

### **!** WARNING

THESE INSTRUCTIONS ARE INTENDED AS AN AID TO QUALIFIED, LICENSED SERVICE PERSONNEL FOR PROPER INSTALLATION, ADJUSTMENT AND OPERATION OF THIS PRODUCT. READ THESE INSTRUCTIONS THOROUGHLY BEFORE ATTEMPTING INSTALLATION OR OPERATION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN IMPROPER INSTALLATION, ADJUSTMENT, SERVICE OR MAINTENANCE POSSIBLY RESULTING IN FIRE, ELECTRICAL SHOCK, CARBON MONOXIDE POISONING, EXPLOSION, PERSONAL INJURY OR PROPERTY DAMAGE.

**DO NOT DESTROY. PLEASE READ CAREFULLY AND  
 KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.**

## TABLE OF CONTENTS

	Page (s)
Description and General Information .....	1
Installation Restrictions and Cautions .....	1
Selecting the proper commercial Dryer Duct Booster duct size .....	2
COP Installation .....	3
Sensing Sampling Tube Location & Installation .....	3-5
Wiring Connections between COP and RT-Series Rooftop Fan or CDB8 Dryer Booster Fan.....	5-7
Adjusting The Pressure (Exhaust) Set Point & Balancing Individual Connections.....	8
Adjustment of Balancing Baffle(s) For Kitchen and Bath Fans .....	9
Operation Overview .....	9
Troubleshooting, Service and Warranty .....	10, 11

Tjernlund Products welcomes your comments and questions. Address all correspondence to:

Customer Service • Tjernlund Products, Inc. • 1601 Ninth Street • White Bear Lake, MN 55110-6794

Call us toll free at 800-255-4208, visit our web site @ [www.tjernlund.com](http://www.tjernlund.com) or email us at [fanmail@tjfans.com](mailto:fanmail@tjfans.com).

## DESCRIPTION

The COP Constant Operating Pressure Control includes a VFD that will modulate the speed of an approved Tjernlund Exhaust Fan to maintain a user adjustable negative pressure set point. The set point is adjusted through dip switches mounted on the COP circuit board. The operating range of the COP control is -0.05" W.C. to -0.53" W.C. in 0.01" W.C. increments.

Pressure is measured in a chase, duct or vent at the farthest point from the Exhaust Fan with the pressure transducer and sensing tube kit. As exhaust volume increases within the duct/chase/vent the resulting reduction in measured pressure causes the COP control VFD to speed the fan up to handle the additional exhaust volume and slow the fan down when the exhaust volume is reduced to maintain a constant exhaust pressure.

## GENERAL INFORMATION

Each COP is electrically factory line tested before shipment.

After opening carton, inspect thoroughly for hidden damage. If any damage is found notify freight carrier and your distributor immediately and file a concealed damage claim.

## INSTALLATION RESTRICTIONS

1. Do not use the COP2 with gas or oil fired heating equipment without interlocking all burners being served with a CIC1 Interlock Control and the required number of MAC-Series Multiple Appliance Controls. The interlock feature is not activated unless a jumper is installed between "A" and "GND" of the COP2 operational mode terminal strip. Follow instructions and wiring diagrams included with the CIC1 Interlock Control and perform operation check to validate the interface with the COP2 Control.
2. The COP is intended for indoor installation only. Do not mount the COP on a heat source or in an environment that exceeds 104°F (40°C).
3. The maximum distance wire can be ran from the COP Control to Exhaust Fan Motor is 100 feet.  
The maximum distance wire can be ran from the COP Control to Pressure Transducer is 250 feet. Transducer wiring should be in metal conduit or utilize shielded cable.

## CAUTIONS

The COP must be installed by a qualified installer (an individual properly licensed and/or trained) in accordance with all local codes or, in their absence, in accordance with the National Electrical Code. Failure to install, maintain and/or operate the COP in accordance with manufacturer's instructions may result in conditions which can produce bodily injury and property damage.

1. Disconnect power supply from the COP when making wiring connections and servicing the COP. Failure to do so may result in personal injury and/or equipment damage.
2. All installation restrictions and instructions in the Tjernlund Exhaust Fan installation instructions must be followed when using the COP.
3. Make certain power source is adequate for the COP and Tjernlund Exhaust Fan requirements. Do not add equipment to a circuit when the total electrical load is unknown.

## SELECTING THE PROPER COMMERCIAL DRYER DUCT BOOSTER DUCT SIZE

Dryers operate most efficiently when exhaust velocities between 1200-2200 feet-per-minute (FPM) are maintained. The number of co-ducted dryers operating, exhaust fan model selection and the diameter and length of the common exhaust duct can dramatically affect exhaust velocity. Follow the recommendations below to maximize the efficiency of the Tjernlund exhaust system and connected dryers.

Over sizing the exhaust manifold will reduce velocities and allow more opportunity for lint to drop out of the exhaust stream. Undersized or excessively long exhaust manifolds will increase drying time and operating costs. COP controller set point adjustments will allow velocities to be fine tuned.

Common exhaust manifold sizing and Dryer Booster Fan selection

1. Based on the CFM total for all connected dryers find the Total Dryer CFM value in the left column of the table equal to or greater than that CFM and determine the common manifold minimum or maximum duct diameter.
2. Trace to the right to select the Dryer Booster and determine the maximum equivalent length of common duct based upon your choice of either the minimum or maximum duct diameter.

**Example:**

4 Dryers @ 225 CFM/ea.  
 4 x 225 = 900 Total Dryer CFM  
 Minimum duct diameter at 900 CFM is 9 inches  
 Maximum duct diameter at 900 CFM is 12 inches

Installing a common duct sized between 9" and 12" is the optimal size range for maintaining a proper velocity across all operating conditions. Trace to the right to select the desired Dryer Booster and maximum equivalent feet of common duct based on your duct diameter choice.

### Commercial Dryer Booster Selection and Duct Sizing Table

Total Dryer CFM	Common Manifold Minimum Duct Dia.	Common Manifold Maximum Duct Dia.	Rooftop Mount Series	Max. Equivalent Feet @ Min. Duct Diameter	Max Equivalent Feet @ Max. Duct Diameter	Indoor Mount CDB8	Max Equivalent Feet @ Min. Duct Diameter	Max Equivalent Feet @ Max. Duct Diameter
400	6"	8"	RT750	50	200	CDB8	120	200
500	7"	9"	RT750	50	150	CDB8	160	200
600	8"	10"	RT750	50	150	CDB8	165	200
700	8"	10"	RT750	NA	50	CDB8	100	200
800	9"	10"	RT1500	150	200	CDB8	100	150
900	9"	12"	RT1500	50	200	CDB8	30	125
1000	10"	12"	RT1500	100	200	CDB8	15	30
1100	10"	12"	RT1500	75	200	CDB8	NA	NA
1200	10"	14"	RT1500	50	200	NA	NA	NA
1300	10"	14"	RT1500	50	200	NA	NA	NA
1400	12"	14"	RT1500	75	150	NA	NA	NA
1500	12"	14"	RT1500	50	150	NA	NA	NA

**Contact Tjernlund Tech Service for advice on applications outside the boundaries of this table.**

**Important Common Manifold Construction Recommendations**

Always install a capped length of straight pipe at least 1 pipe diameter long behind the dryer farthest from the exhaust termination for a stable place to measure exhaust pressure. Always connect individual dryers to the common manifold using wye connectors pointed towards the exhaust termination. Do not use straight tee connections.

## COP INSTALLATION

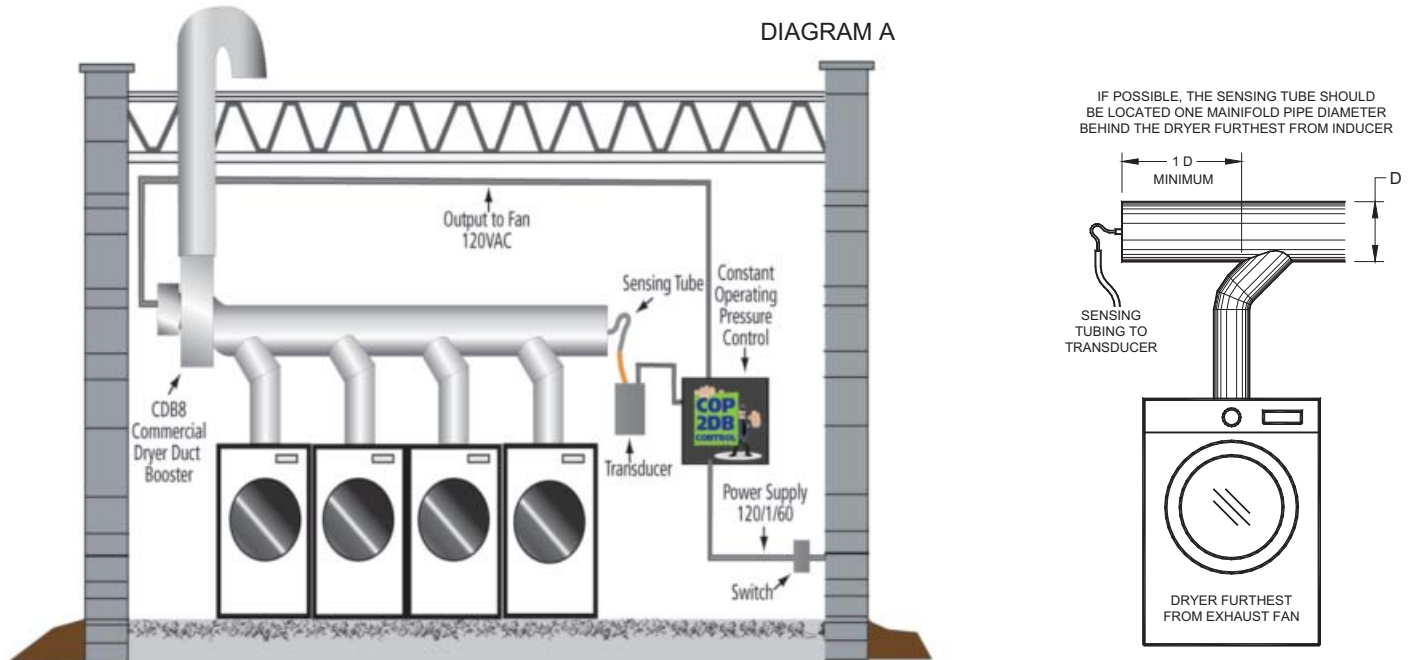
The COP is intended for indoor installation only. Do not mount the COP on a heat source or in an environment that exceeds 104°F (40°C). Examples of improper mounting surfaces include vent pipe, top of heater casing or any place where radiant or convective heat would cause the junction box temperature to exceed temperature limits.

Using the key hole slots on the back of the COP junction box as a template, mark (4) holes on the mounting surface, drill 1/4" pilot holes for wall anchors if necessary, and secure junction box using provided screws.

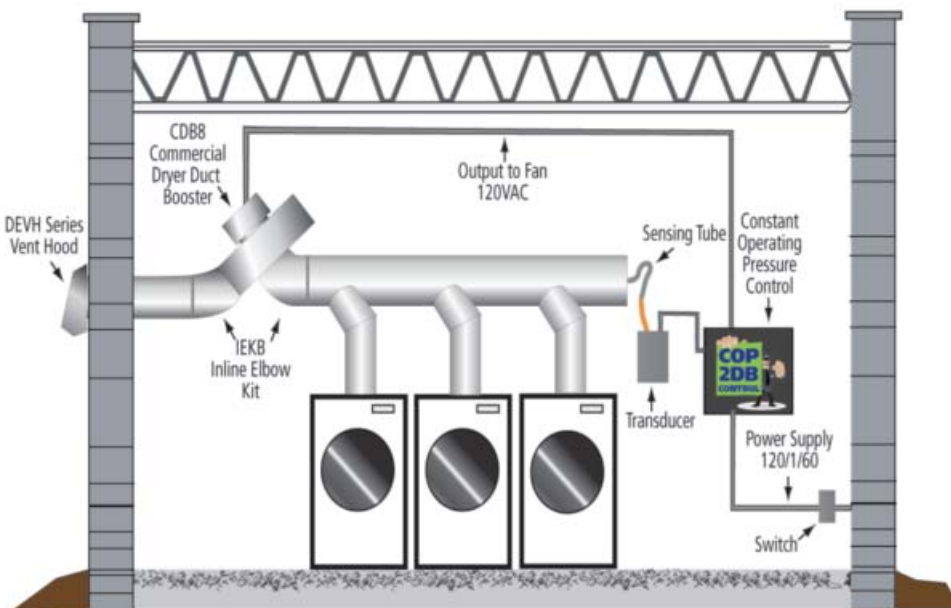
## PRESSURE SENSING TUBE LOCATION

### MULTIPLE DRYERS JOINED IN A COMMON HORIZONTAL DUCT

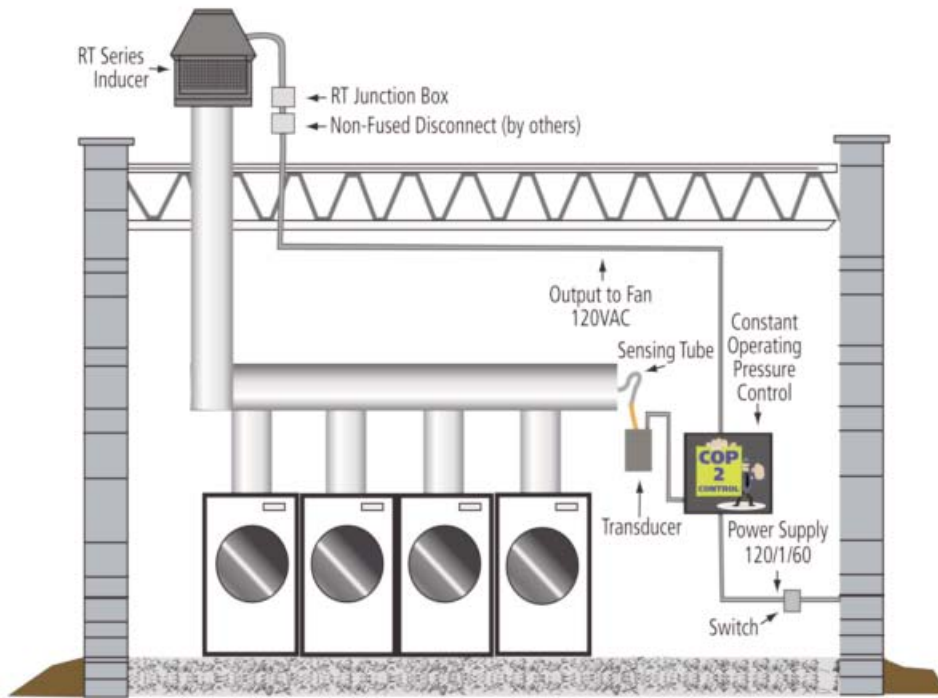
The sensing tube should be installed in the vent cap of a tee or at the rear of a common exhaust manifold, in back of the vent connector that is farthest from the Dryer Exhaust Fan. The tee is necessary so that only static pressure is measured, (See Diagram A). If the pressure sensing tube is installed in the side of a duct it will also measure velocity pressure, giving an incorrect signal back to the COP Control. If mounting on the side of the duct is unavoidable, the sensing tube should be flush to the interior wall of the duct. Avoid sampling near or in elbows. Duct connections should be sealed to prevent leakage or entrainment. Installer must provide access for lint clean out.



**Dryers Common Vented Vertically with CDB8 & COP2DB**



**Dryers Common Vented Through Side Wall with CDB8 & COP2DB**

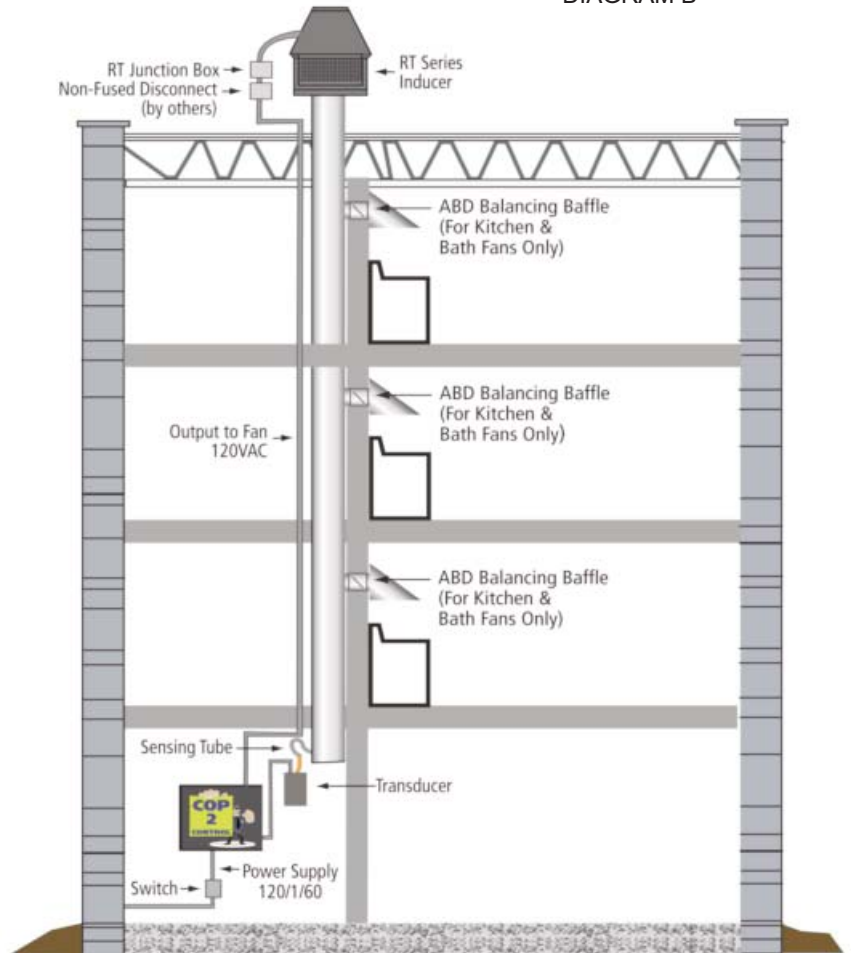


**Dryers Common Vented Vertically with RT-Series Inducer & COP2**

**MULTIPLE DRYERS, KITCHEN OR BATH FANS EXHAUSTED INTO A COMMON VERTICAL CHASE**

The sensing tube should be installed to sample the chase pressure at a point below the lowest duct connection but above any point in the clean out that may accumulate moisture or lint. If sampling pressure in the side of a chase, the sensing tube end should be flush to the interior wall of the chase, (See Diagram B). Duct connections should be sealed to prevent leakage or entrainment of air. Installer must provide access for lint clean out.

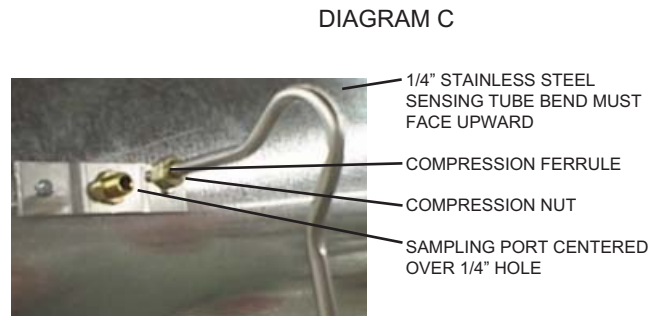
DIAGRAM B



**Chase Exhaust for Kitchens & Baths or Dryers with RT-Series & COP2**

## PRESSURE SENSING TUBE INSTALLATION

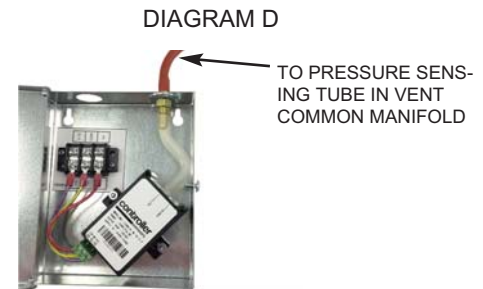
1. Follow sensing tube location recommendations on pages 3-4. Use a sharp drill bit to reduce burr, drill a 1/4" hole for pressure sensing tube. Screw sensing tube bracket to duct/chase with sampling hole centered, (See Diagram C).
2. Insert stainless steel sensing tube through 1/4" hole enough to just penetrate interior of duct/chase and lock in place with compression ferrule and nut, (See Diagram C).



## PRESSURE TRANSDUCER MOUNTING AND TUBING CONNECTION

Using the key hole slots on the back of the Pressure Transducer junction box as a template, mark (2) holes on the mounting surface, drill 1/4" pilot holes for wall anchors if necessary, and secure junction box using provided screws.

Using the included flexible tubing connect the sensing tube to the barbed port on the exterior of the Pressure Transducer junction box. Excessive additional lengths of tubing will delay the response of the VFD which can lead to control lag, (See Diagram D).

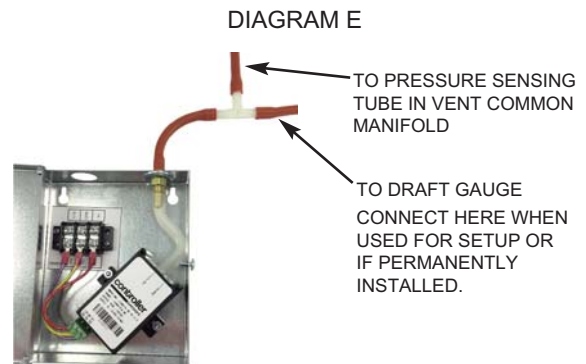


## SYSTEM TEST PROCEDURE

If using COP2 with RT-Series in conjunction with oil or gas fired heating equipment, follow the interlock test procedure outlined within the CIC1 installation instructions.

After wiring is complete with supply power switched on and the COP activation RUN terminals C1 & C2 closed with a switch or jumper, the Exhaust Fan will run. The fan should operate and maintain the factory set point of -0.10" W.C. Disconnect the sensing tube from the barbed fitting on the Transducer electrical box. The fan should ramp to full speed. Reconnect the tube. The fan should slow down to the original speed.

This change in fan performance can be demonstrated by viewing a draft gauge that is teed into the tubing from the Pressure Transducer, (See Diagram E). Draft gauge should be connected as close as possible to COP Transducer to achieve a reading on draft gauge similar to COP Transducer.



## WIRING

### WARNING

The COP must be wired by a qualified installer (an individual properly licensed and/or trained) in accordance with these instructions and in accordance with all local codes or in their absence, with the current editions of NFPA 70, National Electrical Code in the U.S. or CSA C22.1-12 Canadian Electrical Code in Canada.

All wiring from the COP to the Dryer Exhaust Fan junction box must be appropriate Class 1 wiring as follows: installed in rigid metal conduit, intermediate metal conduit, rigid non-metallic conduit, electrical metallic tubing, Type MI Cable, Type MC Cable, or be otherwise suitably protected from physical damage. Transducer wiring should be in metal conduit or utilize shielded cable.

COP Control supply power may be switched through a building management system, pressure switch or other 115 VAC switch.

The maximum distance VFD output power from the COP to Dryer Exhaust Fan Motor is 100 feet. Exceeding this distance can result in undesirable COP and Exhaust Fan operation and possible damage to both the fan and the control.

The maximum distance control signal wire can be ran from the COP to Pressure Transducer is 250 feet. Exceeding this distance can result in lower than desired signal strength. Transducer wiring should be in metal conduit or utilize shielded cable. Non-shielded signal wiring can be influenced by outside conditions resulting in undesirable operation of the COP control.

## IMPORTANT

The capacitor for the RT-Series fan should remain within the junction box of the flexible whip. Do not install within fan motor compartment.

Failure to wire cooling fan as directed voids warranty.

Installer must supply overload and disconnect protection as dictated by local and national codes. Do not use a fused disconnect.

## INSTALLING RT-SERIES FAN ELECTRICAL WHIP

The RT series fan is shipped with an Electrical Whip Assembly which is not connected to the fan. Follow these instructions to connect and wire the whip to the fan. Pull the wires out of the fan through the gasketed hole provided on the fan cover of the RT unit and wire nut the fan leads to the corresponding colored wires on the free end of the whip.

Remove the (2) 8-32 nuts holding the gasket on the electrical access cover of the RT-Series fan. Carefully stuff the wire nipped connections back into the fan and secure the cover plate and gasket to the fan housing using the nuts removed in the above step. Firmly tighten the (2) 8-32 nuts until the gasket compresses.

## RT-SERIES FAN CONNECTIONS TO COP CONTROL

Secure the junction box on the opposite end of COP whip to the power supply conduit. Wire nut the 5 leads from the COP (Red, White/Red, Ground, Black and White) to the corresponding colors of the RT-Series Whip. Stuff Wires into 4 x 4 box on whip. Place provided gasket on 4 x 4 weather tight box opening. Install the 4 x 4 box cover to the j-box and firmly tighten with provided screws until the gasket compresses.

## CDB-SERIES FAN CONNECTIONS TO COP CONTROL

Install metal conduit containing 5 leads, (Red, White/Red, Ground, Black and White) between the COP2DB and CDB8 Fan. Fasten to CDB8 Leads with wire nuts and connect wires to COP2DB terminal strip as depicted in wiring diagram.

**IMPORTANT:** Installer must supply overload and disconnect protection. COP Control power may be switched through a building management system, pressure switch or other 115 VAC switch

Connect 115 VAC supply voltage to L1, N and the ground terminal of the COP right side power terminal strip. Connect Cooling Fan BLK and WHT terminals of COP right side power terminal strip to the Black and White cooling fan leads of the Exhaust Fan. Connect Red, WHT/RED stripe & Ground of COP right side power terminal strip the corresponding colored wires of the Exhaust Fan.

## TRANSDUCER CONNECTIONS

Connect the V+, COM and 1-10 V terminal of the COP terminal strip to the corresponding terminals within the j-box of the Transducer.

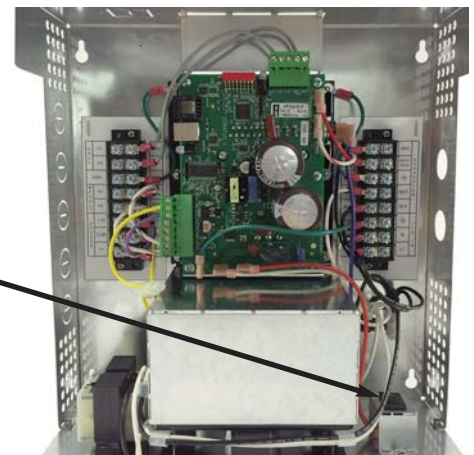
## ACTIVATION CONNECTIONS

Use any type of dry contact switch to close RUN position C1 to C2 to activate COP. Alternatively, jumper position C1 to C2 for constant operation.

## REMOVING POWER FROM & RESETTING VFD DRIVE

A fault can be reset on the VFD Drive if the call to C1 & C2 RUN terminals is removed and/or the Power Switch to the VFD Board in lower right of COP box is turned off for a minimum of 1 minute so capacitors can fully discharge. **IMPORTANT:** Cycling the VFD Power Switch off/on without at least a minute delay may result in damage to the VFD.

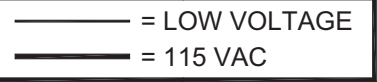
DIAGRAM F



**WARNING:** This power switch is for the VFD only. 115 VAC to BLK & WHT from COP to Exhauster cooling fan, 115 VAC to COP VFD cooling fan and 24 VAC power supply to Transducer will still be live! Disconnect main breaker that supplies 115 VAC to L1 & N on COP Control if it is necessary to disconnect all power in the COP control, (See Diagram F).

# COP SYSTEM WIRING

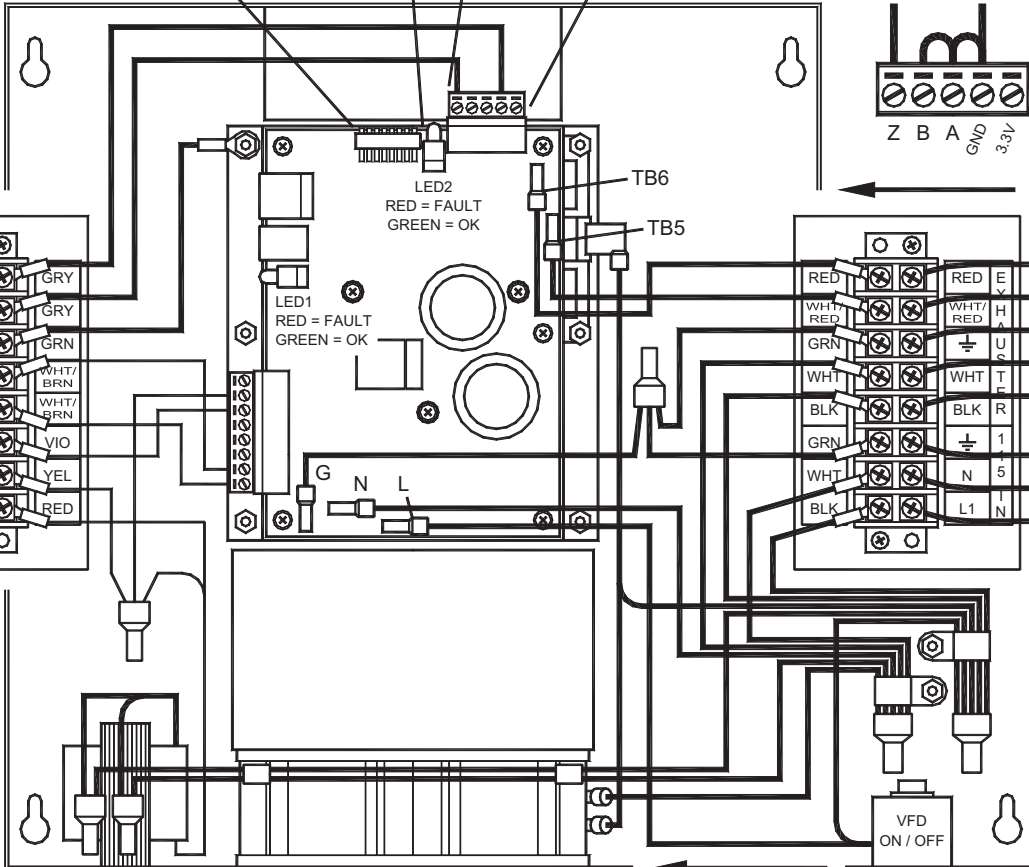
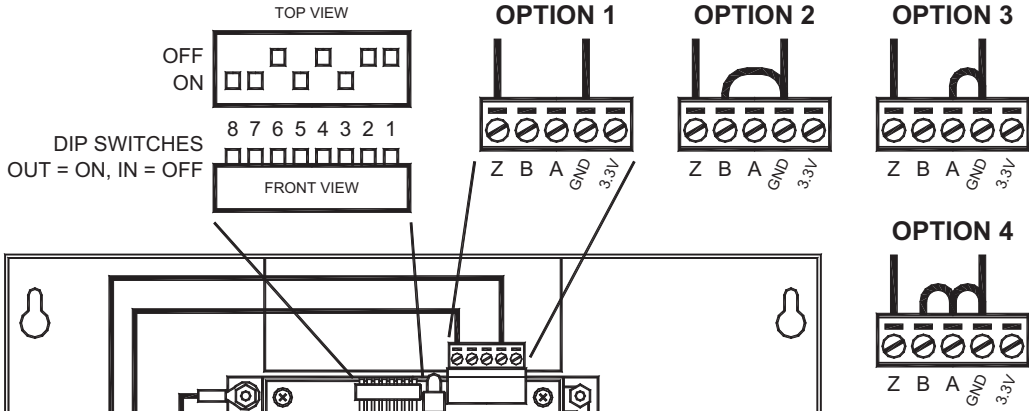
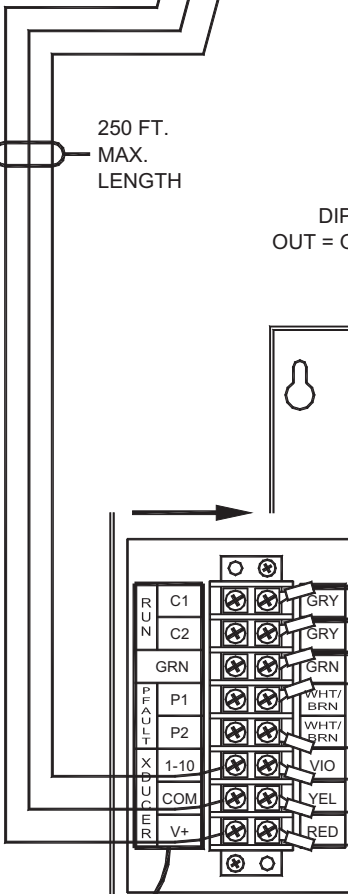
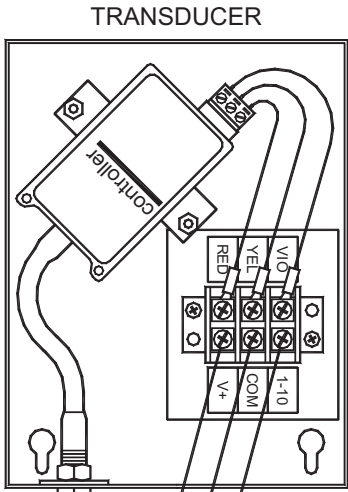
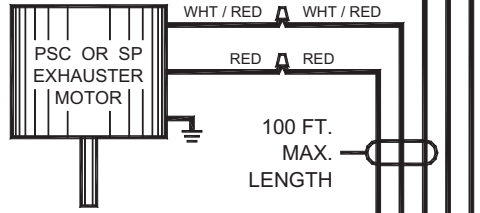
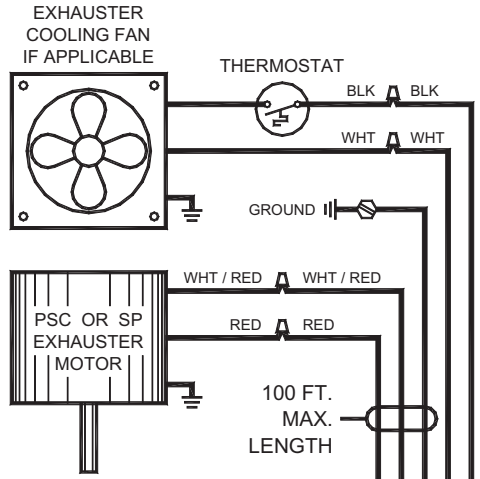
## LEGEND



### WARNING

Do not use the COP2 with gas or oil fired heating equipment without interlocking all burners being served with a CIC1 Interlock Control and the required number of MAC-Series Multiple Appliance Controllers. The interlock feature is not activated unless a jumper is installed as shown in OPTION 3 or 4 below.

- OPTION 1:** Exhaust Only
- OPTION 2:** Exhaust Only, No Overdraft Fault
- OPTION 3:** Exhaust with CIC1 Interlock
- OPTION 4:** Exhaust with CIC1 Interlock, No Overdraft Fault



These are Signal Terminals. DO NOT supply power to them or damage to the VFD will result.

PART 1303907  
 FIGURE 8052082  
 9-27-16

**Input:** 115 VAC +/- 10%, 47-64 Hz, Single Phase, 8.0 Amps maximum  
**Output:** 115 VAC +/- 10%, 6-70 Hz, Single Phase, 0.12 - 6.2 Amps  
 Over-Temperature and Over-Current Protected.  
 For use only with approved Tjernlund Products, Inc. model fans.

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## ADJUSTING THE EXHAUST PRESSURE SET POINT

The pressure set point is adjusted by positioning dip switches 6 - 1 to match the desired setting listed on the Pressure Setpoint Table below. The factory set point is 0.10" W.C. The dip switches are located on the Red block on the top of the COP circuit board. A dip switch is ON when pulled OUT towards you. A dip switch is OFF when pushed IN away from you.

**CAUTION:** Disconnect electrical power to COP L1 & N prior to adjusting dip switch settings.

### ACCELERATION SPEED SETTINGS

Dip Switches 7-8 are used to select drive response time. Slow (30 sec) = 7 ON, 8 OFF, Medium (20 sec) = 7 OFF, 8 ON, Fast (10 sec) = 7 ON, 8 ON,

The Fast (7 ON, 8 ON) acceleration is the factory default. Acceleration adjustment is typically not required unless set points of greater than 0.30" W.C. are selected or if the vent run is a long length.

6 → 1

Pressure Setpoint Table						
Output WC	DIP switch settings					
	6	5	4	3	2	1
-0.05	IN	IN	OUT	OUT	OUT	OUT
-0.06	IN	OUT	IN	IN	IN	IN
-0.07	IN	OUT	IN	IN	IN	IN
-0.08	IN	OUT	IN	IN	OUT	IN
-0.09	IN	OUT	IN	IN	OUT	OUT
-0.10	IN	OUT	IN	OUT	IN	IN
-0.11	IN	OUT	IN	OUT	IN	OUT
-0.12	IN	OUT	IN	OUT	OUT	IN
-0.13	IN	OUT	IN	OUT	OUT	OUT
-0.14	IN	OUT	OUT	IN	IN	IN
-0.15	IN	OUT	OUT	IN	IN	OUT
-0.16	IN	OUT	OUT	IN	OUT	IN
-0.17	IN	OUT	OUT	IN	OUT	OUT
-0.18	IN	OUT	OUT	OUT	IN	IN
-0.19	IN	OUT	OUT	OUT	IN	OUT
-0.20	IN	OUT	OUT	OUT	OUT	IN
-0.21	IN	OUT	OUT	OUT	OUT	OUT
-0.22	OUT	IN	IN	IN	IN	IN
-0.23	OUT	IN	IN	IN	IN	OUT
-0.24	OUT	IN	IN	IN	OUT	IN
-0.25	OUT	IN	IN	IN	OUT	OUT
-0.26	OUT	IN	IN	OUT	IN	IN
-0.27	OUT	IN	IN	OUT	IN	OUT
-0.28	OUT	IN	IN	OUT	OUT	IN
-0.29	OUT	IN	IN	OUT	OUT	OUT
-0.30	OUT	IN	OUT	IN	IN	IN
-0.31	OUT	IN	OUT	IN	IN	OUT
-0.32	OUT	IN	OUT	IN	OUT	IN
-0.33	OUT	IN	OUT	IN	OUT	OUT
-0.34	OUT	IN	OUT	OUT	IN	IN
-0.35	OUT	IN	OUT	OUT	IN	OUT
-0.36	OUT	IN	OUT	OUT	OUT	IN
-0.37	OUT	IN	OUT	OUT	OUT	OUT
-0.38	OUT	OUT	IN	IN	IN	IN
-0.39	OUT	OUT	IN	IN	IN	OUT
-0.40	OUT	OUT	IN	IN	OUT	IN
-0.41	OUT	OUT	IN	IN	OUT	OUT
-0.42	OUT	OUT	IN	OUT	IN	IN
-0.43	OUT	OUT	IN	OUT	IN	OUT
-0.44	OUT	OUT	IN	OUT	OUT	IN
-0.45	OUT	OUT	IN	OUT	OUT	OUT
-0.46	OUT	OUT	OUT	IN	IN	IN
-0.47	OUT	OUT	OUT	IN	IN	OUT
-0.48	OUT	OUT	OUT	IN	OUT	IN
-0.49	OUT	OUT	OUT	IN	OUT	OUT
-0.50	OUT	OUT	OUT	OUT	IN	IN
-0.51	OUT	OUT	OUT	OUT	IN	OUT
-0.52	OUT	OUT	OUT	OUT	OUT	IN
-0.53	OUT	OUT	OUT	OUT	OUT	OUT



## ADJUSTMENT OF BALANCING BAFFLE(S) FOR KITCHEN AND BATH FANS USING COP2 WITH RT-SERIES EXHAUSTER

**IMPORTANT:** Do Not use Balancing Baffles for dryer applications due to the potential for lint buildup.

1. With all balancing baffles closed and starting with connection at lowest floor drill a small sampling hole in duct connection to the chase 1 foot behind the Balancing Baffle (opposite side of chase connection).
2. With the COP2 Control, RT-Series Fan and Bath/kitchen fans connected to the duct operating, gradually open the Balancing Baffle until desired negative exhaust pressure is measured and lock in place. Typically a measurement of a -0.02 to -0.05" W.C. is adequate.
3. Repeat steps 1 and 2 for each floor, moving up towards the RT-Series Fan.
4. After all are set, review all measurements on each and readjust as needed.

## OPERATION OVERVIEW

With 115 VAC supplied to L1 and N and the VFD power switch in the off position the following circuits are powered. The disconnect that powers L1 and N must be switched off to remove power from these circuits:

24 Volt Transformer  
Pressure Transducer  
BLK and WHT terminals to the thermostat of the Exhauster motor cooling fan  
Thermostat for the VFD heat sync cooling fan

When the VFD switch is turned on, the VFD is powered but still must have activation RUN terminals C1 & C2 closed for the Exhaust Fan to operate.

With the activation circuit closed the COP controller will reference the sampling tube pressure via a 1-10 VDC signal with 2.8 VDC = 0.00" W.C. As pressure is reduced by additional exhaust volume, winds or interior negative pressures the transducer will output a lower voltage to the VFD, increase the frequency from the VFD, causing the Exhaust Fan to speed up until the set point pressure is reached. Further fluctuations in measured pressure will cause the VFD to modulate the frequency to the Exhaust Fan so that the set point exhaust pressure is maintained.

If the fan cannot maintain the setpoint pressure within  $\pm 0.02$ " W.C. at anytime for more than a 50 second period, the Green LED on the middle left side of the VFD will turn Red and cause the system to fault. Reset the VFD by turning the on/off switch "Off" for one minute to reset the fault and cycle the fan to determine if a problem exists. If the set point is low enough to allow natural ventilation to exceed the set point jumper "B" to "GND" on the green logic terminal strip to disable over draft protection. The control will now only fault for an under draft condition.

## TROUBLESHOOTING ELECTRICAL PROBLEMS

It is necessary to measure voltage during troubleshooting. Extreme caution must be exercised to prevent injury. If you are unable to determine the defective part with the use of this guide, call your Tjernlund distributor or Tjernlund Products direct at 1-800-255-4208 for further assistance.

### EXHAUST FAN MOTOR DOES NOT OPERATE

Check that the COP control has power by verifying that the top LED is Green.

If this LED is Red, turn the VFD power switch off for a minimum of 1 minute to reset the fault. A Red status indicates an over-current or circuit board over-temperature issue. In some cases an acceleration rate that is too fast can cause an over-current fault. In most cases the Exhaust Fan should be checked to verify that the shaft rotates freely with power disrupted. Since the Exhaust Fan may not operate if the exhaust set point is reached by natural means perform the following test:

Top LED is Green

Verify that the supply power to the COP is switched on and the activation RUN terminals C1 & C2 are closed with a switch or jumper to start the Exhaust Fan. Disconnect the sensing tube from the barbed fitting on the Transducer electrical box. The fan should ramp to full speed. Reconnect the tube. The fan should slow down to the original speed. This change in fan performance can be demonstrated by viewing a draft gauge that is teed into the tubing from the pressure transducer as shown in Diagram E, Page 5.

If removing the sensing tube does not cause the fan to speed up measure AC voltage at terminals V+ and COM of the Transducer and look for a reading between 22 - 30 VAC. If voltage in this range is measured remove tube from the barbed connection on the Transducer and look for between 2.7 - 2.9 VDC when measuring terminals 1-10 and COM.

If voltage to and from the Transducer are in the ranges listed above, measure COP VFD output AC voltage at the Red and WHT/RED stripe terminals with the Transducer tube still disconnected. Look for a reading of around 125 volts AC.

If around 125 VAC is measured check for voltage at the Red and White w/Red stripe leads in the j-box of the Exhaust Fan. If the referenced voltage is measured check motor capacitor and verify reading of  $5\mu\text{F} \pm 5\%$ . If the capacitor is within specs look for around 125 VDC at the Red and White w/Red stripe leads within the motor enclosure. If this voltage range is present, the Exhaust Fan motor is suspect and may need replacement. Remove and bench test with 115 VAC.

## HOW TO OBTAIN SERVICE ASSISTANCE

1. If you have any questions about your COP or if it requires adjustment or repair, contact your installer, contractor or service agency.
2. If you require technical information contact Tjernlund Products, Inc. at 1-800-255-4208 with the following information.
  1. Model of the Exhaust Fan that COP is interlocked with as shown on the Exhaust Fan nameplate.
  2. Name and address of installer and any service agency who performed work on the system.
  3. Date of original installation and dates any service work was performed.
  4. Details of the problem as you can best describe them.

## LIMITED PARTS WARRANTY AND CLAIM PROCEDURE

Tjernlund Products, Inc. warrants the components of the COP for one year from date of installation. This warranty covers defects in material and workmanship. This warranty does not cover normal maintenance, transportation or installation charges for replacement parts or any other service calls or repairs. This warranty DOES NOT cover the complete COP if it is operative, except for the defective part.

Tjernlund Products, Inc. will issue credit or provide a free part to replace one that becomes defective during the one year warranty period. Proof of date of the installation in the form of the contractor sales/installation receipt is necessary to prove the unit has been in service for under one year. All receipts should include the date code of the COP to ensure that the defective component corresponds with the complete unit. This will help prevent possible credit refusal.

1. Follow troubleshooting guide to determine defective component. If unable to determine faulty component, contact your Tjernlund distributor or Tjernlund Technical Customer Service at 1-800-255-4208 for troubleshooting assistance.
2. After the faulty component is determined, return it to your Tjernlund distributor for replacement. Please include COP date code component was taken from. The date code is located on the Electrical Box cover. If the date code is older than one year, you will need to provide a copy of the original installation receipt to your distributor. Credit or replacement will only be issued to a Tjernlund distributor after the part has been returned prepaid to Tjernlund and verified defective.

## WHAT IS NOT COVERED

Product installed contrary to our installation instructions, altered, neglected or misused  
Product that has been wired incorrectly  
Any freight charges related to the return of the defective part  
Any labor charges related to evaluating and replacing the defective part

## REPLACEMENT PARTS

<u>Component</u>	<u>Part Number</u>
24 Volt Transformer	950-2030
COP Pressure Transducer	950-9352
Heat Sync Cooling Fan T-Stat	950-8301
Heat Sync Cooling Fan	950-0020

COP2 Heater Interlock Control\*                      CIC1

**\*NOTE:** The CIC1 Accessory Control is a standard UC1 Control with an included relay. It is for use with the COP2 and RT-Series Fans.

**TJERNLUND LIMITED ONE YEAR WARRANTY**

Tjernlund Products, Inc. warrants to the original purchaser of this product that the product will be free from defects due to faulty material or workmanship for a period of (1) year from the date of original purchase or delivery to the original purchaser, whichever is earlier. Remedies under this warranty are limited to repairing or replacing, at our option, any product which shall, within the above stated warranty period, be returned to Tjernlund Products, Inc. at the address listed below, postage prepaid. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, AND TJERNLUND PRODUCTS, INC. EXPRESSLY DISCLAIMS LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF THIS PRODUCT. THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES AND NO AGENT IS AUTHORIZED TO ASSUME FOR US ANY LIABILITY ADDITIONAL TO THOSE SET FORTH IN THIS LIMITED WARRANTY. IMPLIED WARRANTIES ARE LIMITED TO THE STATED DURATION OF THIS LIMITED WARRANTY. Some states do not allow limitation on how long an implied warranty lasts, so that limitation may not apply to you. In addition, some states do not allow the exclusion or limitation of incidental or consequential damages, so that above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which may vary from State to State. Send all inquiries regarding warranty work to Tjernlund Products, Inc. 1601 9th Street, White Bear Lake, MN 55110-6794. Phone (651) 426-2993 • (800) 255-4208 • Fax (651) 426-9547 • Email fanmail@tjfans.com.