EBC 14 Pressure Control

USA

CAN

Job Name: _____

Installer: _____

Installation Date: _____

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EXHAUSTO
VENTING DESIGN SOLUTIONS

Symbol Legend:

The following terms are used throughout this manual to bring attention to the presence of potential hazards or to important information concerning the product.

Danger: Indicates an imminent hazardous situation which, if not avoided, will result in death, serious injury or substantial property damage.

Caution: Indicates an imminent hazardous situation which, if not avoided, may result in personal injury or property damage.

TO REDUCE THE RISK OF FIRE, ELECTRICAL SHOCK OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

1. Use this unit in the manner intended by the manufacturer. If you have questions, contact the manufacturer at the address or telephone number listed on the front of the manual.
2. Before servicing or cleaning the unit, switch off at service panel and lock service panel to prevent power from being switched on accidentally.
3. Installation work and electrical wiring must be done by a qualified person(s) in accordance with applicable codes and standards.
4. Follow the appliance manufacturer's guidelines and safety standards such as those published by the National Fire Protection Associations (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.
5. This unit must be grounded.

How to use this manual

This installation manual does not contain any system design documentation. System design documentation is available from any authorized EXHAUSTO representative.

Accessories, fans and variable frequency drives are not covered by this manual. Please refer to these component's individual manuals.

1. Product Information

1.1 Function

Use

The EXHAUSTO EBC 14 Pressure Control is used with single appliances to monitor and maintain a constant pressure in a mechanical room. This is achieved by modulating the speed of an air supply fan and it can be used with EXHAUSTO Models BESF, BESB, ASF and SFTA.

Typical uses are: 1) Controlling the supply of combustion air to a mechanical room, and 2) Controlling the supply of make up air to a laundry facility with a dryer.

Function

The EBC 14 consists of a control box, and an XTP-Sensor. An outdoor pressure sensor is sold separately. The control box and the XTP-Sensor are both installed inside the mechanical room, where the XTP-Sensor provides a pressure differential signal to the control box. The required room pressure can be set at the control box. The outdoor pressure probe is installed on a roof or outside wall. The EBC 14 can control a fan directly or indirectly via a Variable Frequency Drive (VFD).

When the negative pressure in the mechanical room increases beyond the set point as the appliance consumes combustion air, the EBC 14 will cause the ventilator to increase speed and supply more air in order to meet the pressure set point. If too much air is being introduced, the control slows the ventilator down.

The EBC 14 is interlocked with the heating appliance so a call for heat will activate the ventilator and release the appliance once an adequate pressure has been established. The pressure is set on the control panel, where it is possible to view the setting as well as the actual room pressure on the LCD display. LED-diodes verify ventilator operation and monitor all terminals for proper operation.

A LED-diode indicates any alarms.

A safety function shuts down the appliance after 12 seconds in case of excess negative room pressure. The EBC 14 has an automatic reset.

Construction

The control housing is made of plastic and has a clear cover. It has an IP 54/NEMA 12 rating. It has three 1/2” rigid conduit fittings for power supply and two compression fittings for control wires.

Code Compliance

Installation must conform to the requirements of the authority having jurisdiction. Where required by the authority having jurisdiction, the installation must also conform to the NFPA31, NFPA54, or NFPA211.

All electrical wiring must be in accordance with the requirements of the authority having jurisdiction or, in absence of such requirements, with the National Electrical Code, NFPA70.

Listings

EXHAUSTO Model EBC 14 is ETL listed to the Standard for Industrial Control Equipment, UL Standard 508, 17th ed. and CSA C22.2 No. 14-95, (ETL-Report J98*12993-001). It is also tested and listed for use with, and as a part of, an EXHAUSTO MCAS system (ETL Report J99*18091-003).

The control is manufactured at an ISO9001 certified plant and bears the European CE compliance label.

1.2 Shipping

Standard packing list

The EBC 14 contains the following:

- EBC 14 control unit
- XTP-Sensor
- Jumpers for the EBC 14

The Outdoor Static Pressure Sensor and silicone tubing will appear as a separte item on the packing list.

If other components are shipped, these will appear as separate items on the shipping packing list.

1.3 Warranty

Complete warranty conditions are available from EXHAUSTO, Inc.

2. Specifications

2.1 Dimensions & Capacities

EBC 14 Control		
Power Supply	V	1x120VAC
Amperage	A	6.3
Operating Temperature	°F/°C	-4 to 122 / -20 to 50
Range of Operation	inWC/Pa	0-0.6 / 0-150
Tolerance	inWC/Pa	0.01 / 3 +/- 10%
Control Signal	mA	max. 10
Output	VAC	10-120
	VDC	0-10
Dimensions	A in/mm	6.9 / 175
	B in/mm	8.1 / 205
	C in/mm	4.0 / 102
Weight	lbs/kg	3.0 / 1.5
EMC Standard	Emission	EN50 081-1
	Immunity	EN50 082-2
XTP-Sensor		
Power Supply	VDC	0-24
Amperage	mA	<20
Output	VDC	0-10
Operating Temperature	°F/°C	-4 to 140 / -20 to 60
Tolerance	inWC/Pa	0.01 / 3 +/- 10%
Dimensions	D in/mm	1.93 / 49
	E in/mm	2.92 / 74
	F in/mm	3.63 / 92
	G in/mm	3.15 / 80
Weight	lbs/kg	0.9 / 0.4
Outdoor Pressure Probe		
Dimensions	H in/mm	6.5 / 166
	I in/mm	2.6 / 65
	J in/mm	12.2 / 310

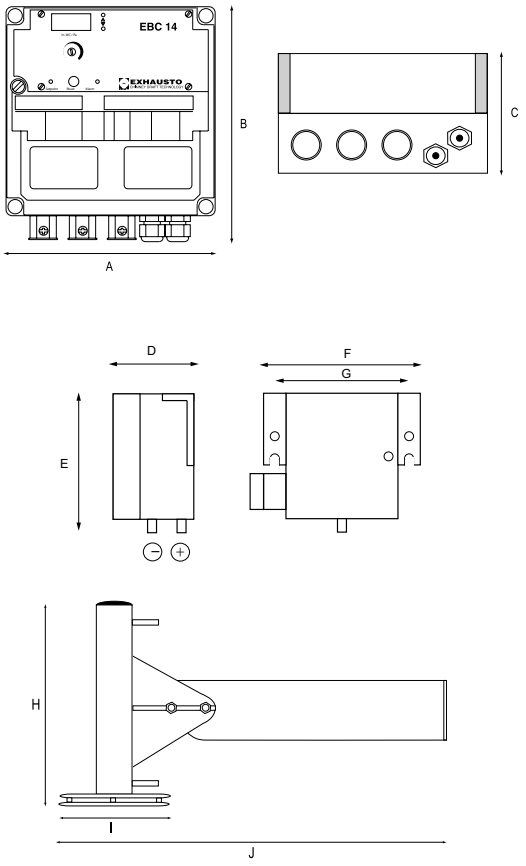
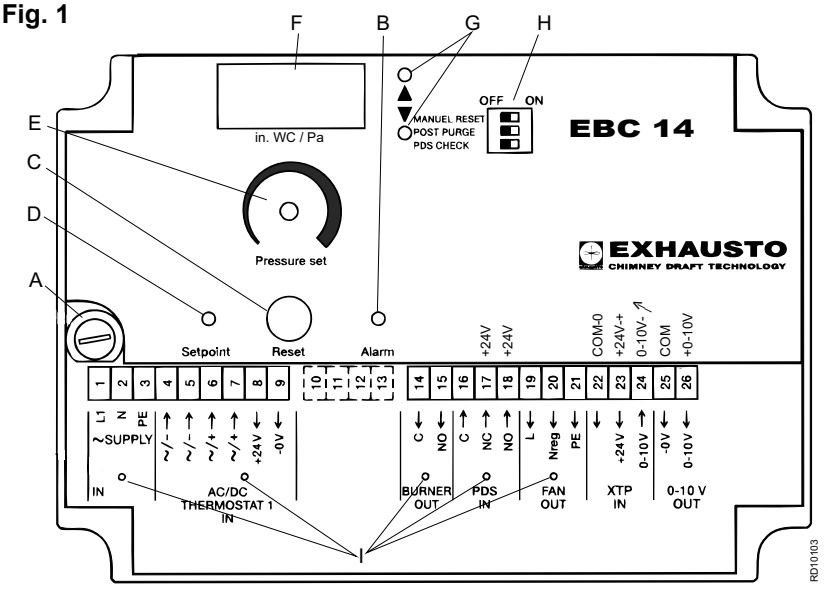


Fig. 1



Symbols:

Fig. 1-A	Fuse holder
Fig. 1-B	Alarm-red LED
Fig. 1-C	Reset button
Fig. 1-D	Setpoint button
Fig. 1-E	Potentiometer for draft setting
Fig. 1-F	Display
Fig. 1-G	LEDs (yellow) showing increasing/decreasing speed
Fig. 1-H	Dipswitch block
Fig. 1-I	LEDs (green) showing ON/OFF status

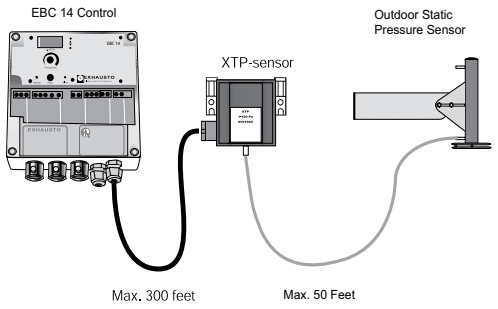
3. Mechanical Installation

3.1 Location

The control and the XTP-Sensor should always be installed inside, preferably in the mechanical room where the appliances are located. The control does not need to be installed in an enclosure. (For outdoor installations, please contact EXHAUSTO). Fig. 2 shows how the components are connected.

The XTP-Sensor cannot be mounted inside an airtight enclosure. It uses the mechanical room pressure and the atmospheric pressure as reference pressure.

Fig. 2

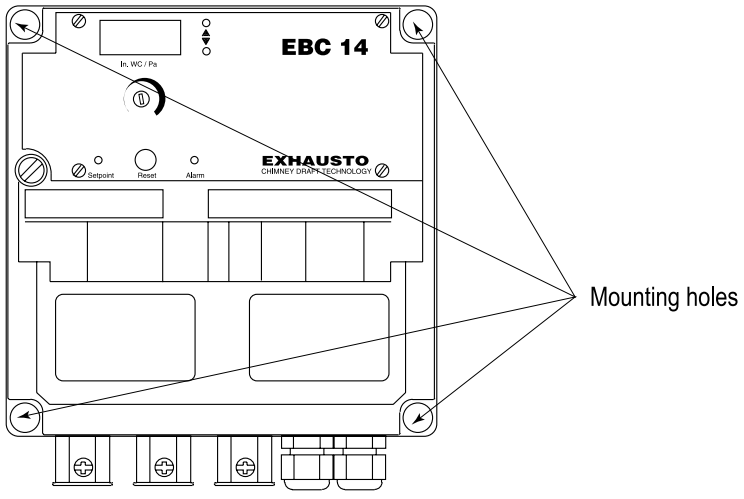


3.2 Mounting of Control Unit

The control can be mounted directly on a wall. Remove the clear cover. The mounting holes are located under the plastic screws that hold the cover in place (see Fig. 3).

The distance between the control and the XTP-Sensor should not exceed three hundred (300) feet. (If a longer distance is required please contact EXHAUSTO.)

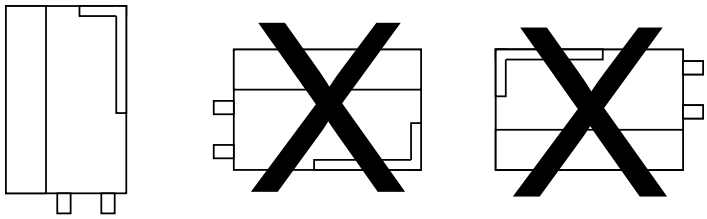
Fig. 3



3.3 Mounting of XTP-Sensor

Attention must be paid to the position and location of the XTP-Sensor. Fig. 4 shows the required position.
Failure to follow this instruction may result in an inoperable system.
The XTP-Sensor should be mounted within fifty (50) feet of the outdoor pressure probe.

Fig. 4



3.4 Mounting of Outdoor Pressure Probe

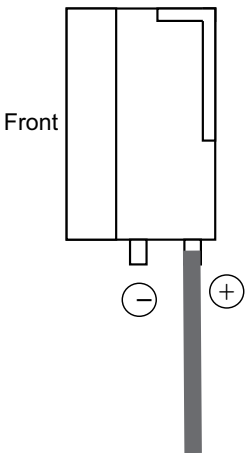
Select a mounting location as free as possible from rooftop obstructions. The choice of location should also consider routing of silicone tubing into the building to minimize tubing run on the roof.
Install the probe on an existing structure, like a pole, radio or TV antenna mast. Alternately, the “L” shaped bracket can be attached directly to any wall or rooftop.
It is recommended that the full length of tubing (50 feet) be used. Excess tubing should be coiled at some convenient location rather than cut off. Longer lengths are available.

Obstructions such as trees, chimneys, signs and buildings all cause turbulence, which results in abnormal and thus inaccurate static pressure. Position the probe as far from the sources of turbulence as possible.

3.5 Connecting XTP-Sensor to Outdoor Pressure Probe

The XTP-Sensor is connected to the outdoor pressure probe via a silicone tube. If necessary, 1/4” copper tubing can be used instead of the silicone tubing. In this case the fittings must be replaced with proper size fitting for the 1/4” copper tubing.
Make sure the tube is connected to the proper XTP-Sensor port (+) as shown in Fig. 5

Fig. 5



4. Electrical Installation

4.1 General

Danger: Turn off electrical power before servicing. Contact with live electric components can cause shock or death.

EBC 14 is designed for 1x120VAC power supply only.

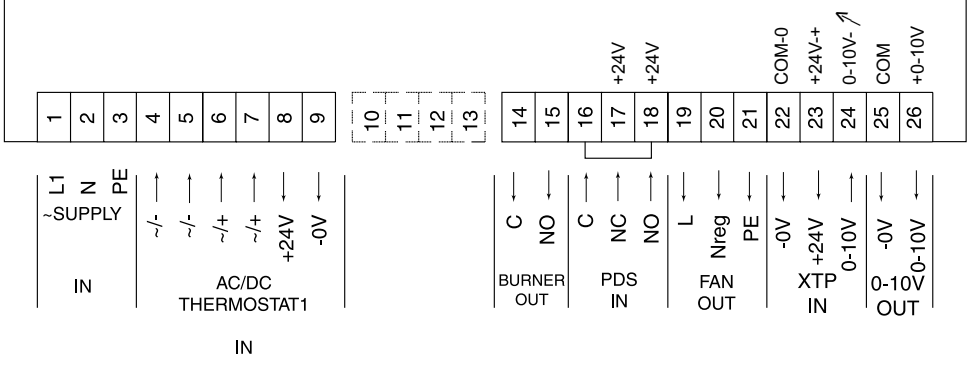
The control is connected so the fan runs continuously independent of appliance operation. The control will monitor and maintain a constant pressure.
The system consists of an Integrated Proven Draft Switch.

The terminals are connected as shown on Fig. 6:

Terminal	Use
1	Power Supply-L1
2	Power Supply-N
3	Power Supply-Ground
4-5	Voltage Input from Appliance Thermostat Optocoupler (-) (10-120VAC/DC)
6-7	Voltage Input from Appliance Thermostat Optocoupler (+) (10-120VAC/DC)
8	24V power supply
9	0VDC power supply Common
14	Burnerrelaydrycontact-Common (max. 120 VAC, 8 Amps.)
15	Burner relay dry contact-Normally Open (max. 120VAC, 8 Amps.)
16	PDS-C (Common) Proven Draft Switch

Terminal	Use
17	PDS-NC (Normally Closed) Proven Draft Switch
18	PDS-NO(NormallyOpen)Proven Draft Switch
19	BESF/BESB (120V) — L1 Power to fan
20	BESF/BESB (120V) — N (regulated) to fan
21	BESF/BESB (120V) — Ground to fan
22	XTP-0VDC Power Supply Common (transducer)
23	XTP-24VDC Power Supply (transducer)
24	XTP-0-10VDC Return Signal (transducer)
25	Control signal 0VDC (for VFD) Common
26	Control signal 0-10VDC (for VFD) Output

Fig. 6



4.2 Intermittent Air Supply Fan Operation (120V only)

The control can be interlocked with an appliance in two ways:

It can be interlocked directly with an appliance control, or with a dry set of contacts.

Interlock with burner

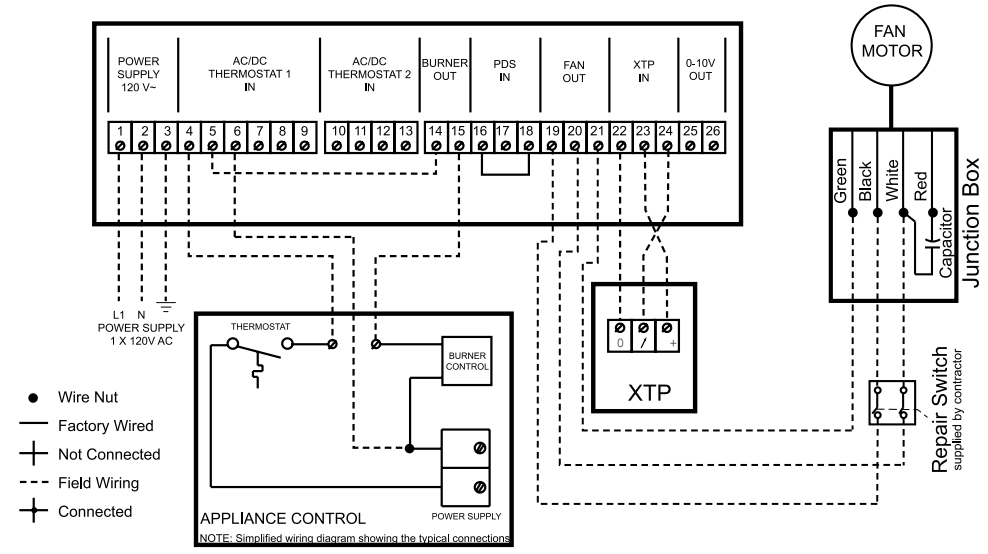
Figure 7 shows how an appliance control signal (10-120V AC/DC) is connected to the EBC 14:

- Connect the power supply to terminals 1, 2 and 3.
- Connection to the appliance:
  - Connect the boiler start signal to terminal 4.
  - Jump terminals 5 and 14.
  - The start signal to the burner is now activated by terminal 15.
  - Connect Neutral to terminal 6.
- To connect the air supply fan:
  - Connect the air supply fan to terminals 19, 20 and 21. Neutral line must be a dedicated line directly from the fan to the control terminal 20. Refer to the BESF or BESB Installation Manual, 4. Wiring the air supply fan.
- The XTP-transducer is connected to terminals 22, 23 and 24.

Fig. 7

Sample Wiring Diagram - Burner Interlock

Connection to 120V Fan - Interntittent Operation



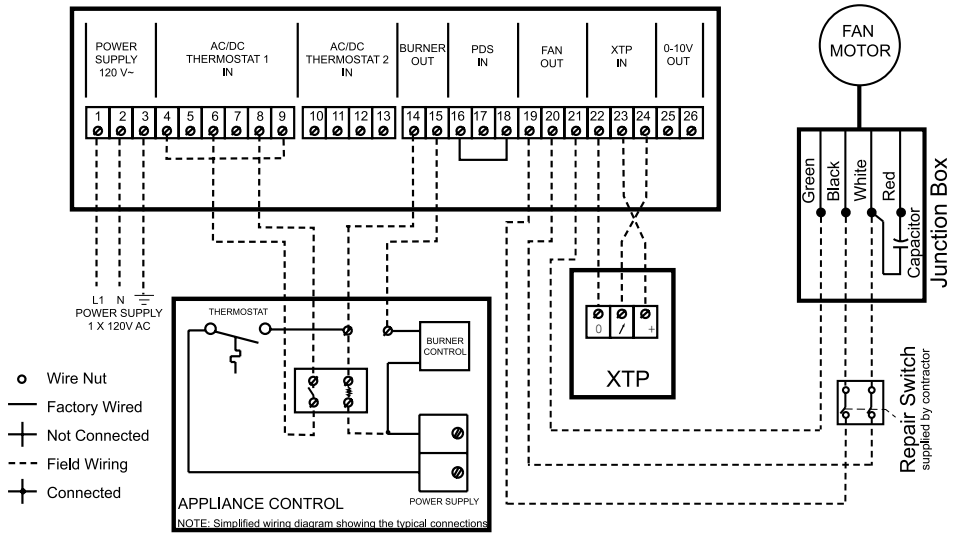
Interlock with dry set of contacts

Figure 8 shows how a dry set of contacts is connected to the EBC 14:

- Connect the power supply to terminals 1, 2 and 3.
- Connection to the appliance:
  - Connect the dry set of contacts to terminals 6 and 8.
  - Jump terminals 4 and 9.
  - The start signal to the burner is now activated by terminal 15.
  - Connect the start signal to the burner to terminals 14 and 15.
- To connect the air supply fan:
  - Connect the air supply fan to terminals 19, 20 and 21. Refer to the BESF or BESB Installation Manual, 4. Wiring the air supply fan.
- Connect the XTP transducer to terminals 22, 23 and 24.

Fig. 8

Sample Wiring Diagram - Dry Contact Relay
Connection to 120V Fan



4.3 Continuous Air Supply Fan Operation

Figure 9 shows how to connect an air supply fan to the EBC 14 if continuous operation is needed:

- Connect the power supply to terminals 1, 2 and 3.
- Jump terminals 5 and 9.
- Jump terminals 6 and 8.
- Connection to the appliance:
  - Connect the start signal from the burner to terminals 14 and 15.
- To connect the air supply fan:
  - If using a 1x120V air supply fan, connect it to terminals 19, 20 and 21 (BESF/BESB). Refer to the BESF/BESB Installation Manual, 4. Wiring the Ventilator.
  - If using a VFD, **do not** connect the fan directly to the EBC 14 control (term. 19, 20 and 21). Instead connect the VFD to terminals 25 and 26. Please refer to the wiring diagram for the Variable Frequency Drive and Fig. 10 below:
- Connect the XTP transducer to terminals 22, 23 and 24.

Fig. 9

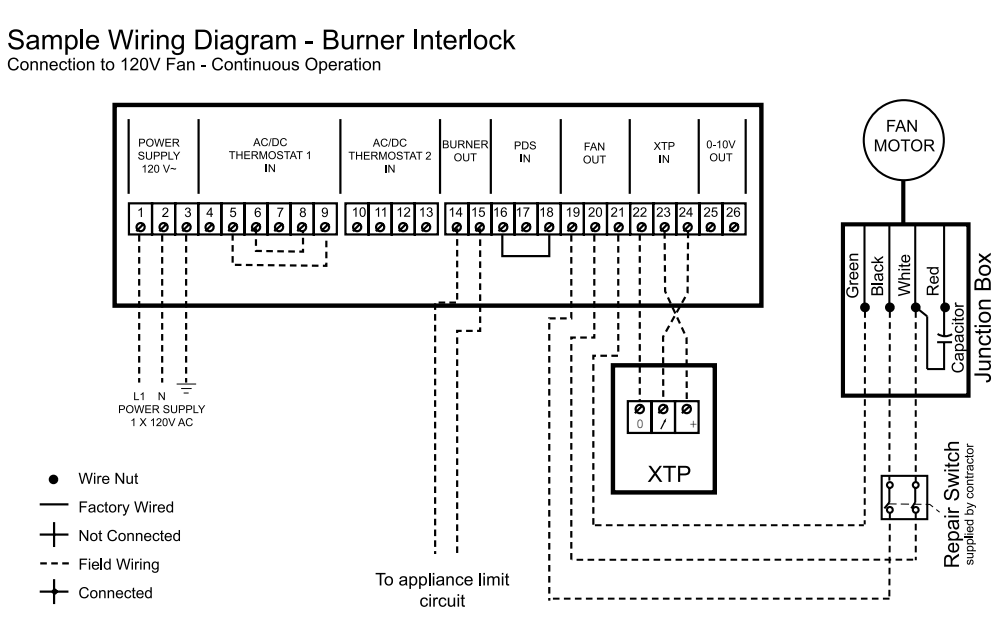
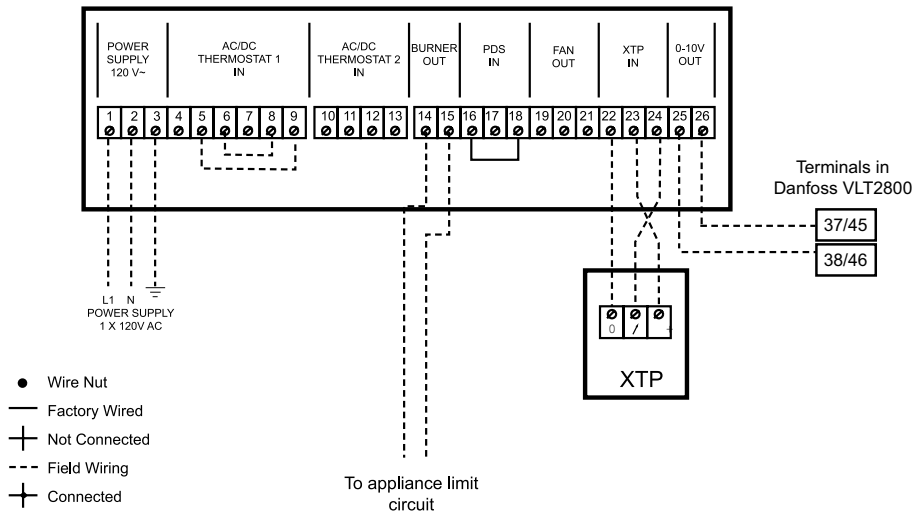


Fig. 10

Sample Wiring Diagram - Burner Interlock

Connection toVariable Frequency Drive - Continuous Operation



5. Startup and Configuration

5.1 General

Dipswitch settings

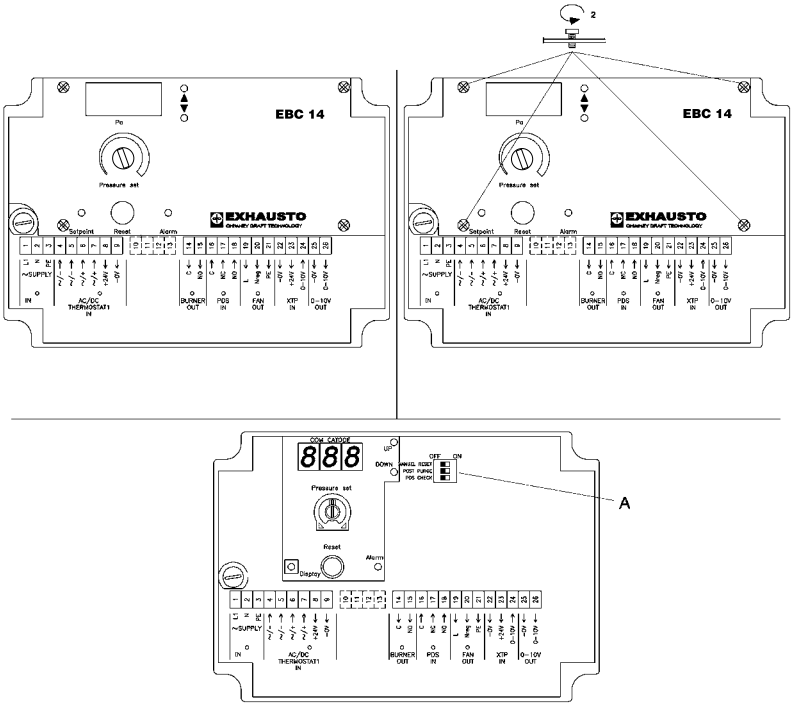
Prior to starting the system check to see if the dipswitch settings are as required:

- Default factory setting: All OFF
- If the factory setting must be changed, the black cover plate must be removed to gain access to the dipswitches (see Fig 11-A):
  1. Remove the (4) flathead screws and lift the top plate off the board.
  2. Change the dipswitch settings.

Dip Switch	Name	OFF	ON
1	MANUAL RESET	Automatic reset at power failure or insufficient draft.	Manual reset at power failure or insufficient draft.
2	POST PURGE	No post-purge.	3 minutes of post purge.
3*)	PDS CHECK	No monitoring to see if the PDS was in NC position prior to start.	The PDS must be in NC prior to start.

*) Always OFF if the Proven Draft Switch (PDS) is not connected.

Fig. 11



5.2 Setting Operating Pressure

The pressure setting of the EBC 14 must be set to 0.01” WC.

The display (Fig. 12-C) has two functions. It can show current pressure set-point, and it can show the actual pressure in the room.

The default mode shows the actual pressure. To change the mode, the set-point button must be pressed continuously.

To adjust the pressure set-point and check safety function follow this procedure:

1. Press the set-point button continuously (Fig. 12-A). The pressure setting will now show on the display. Use a small screwdriver (Fig. 12-B) to set the pressure to 0.01” WC/Pa on the display (Fig. 12-C). Release the set-point button; the actual pressure will now show up on the display.

2. Check that the safety system disconnects the appliance (Fig. 13-B). An error can be simulated by starting the appliance and, after 30 seconds, turn the control or the fan off.

Fig. 12

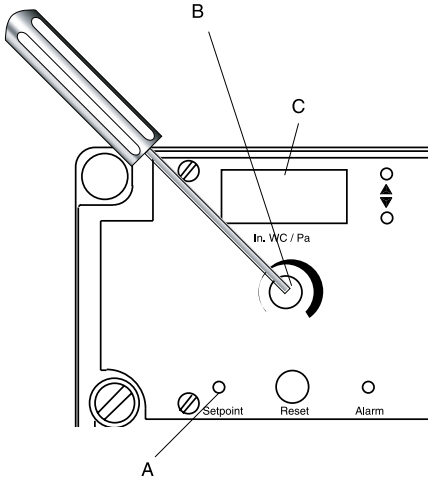
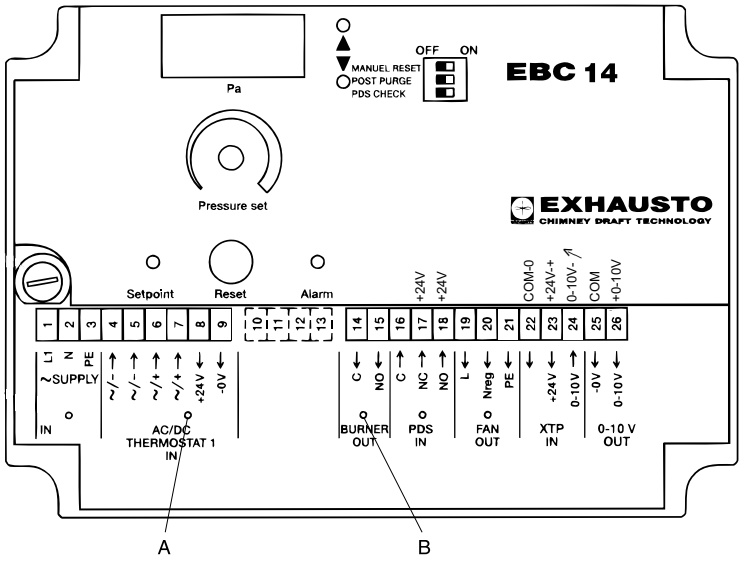


Fig. 13

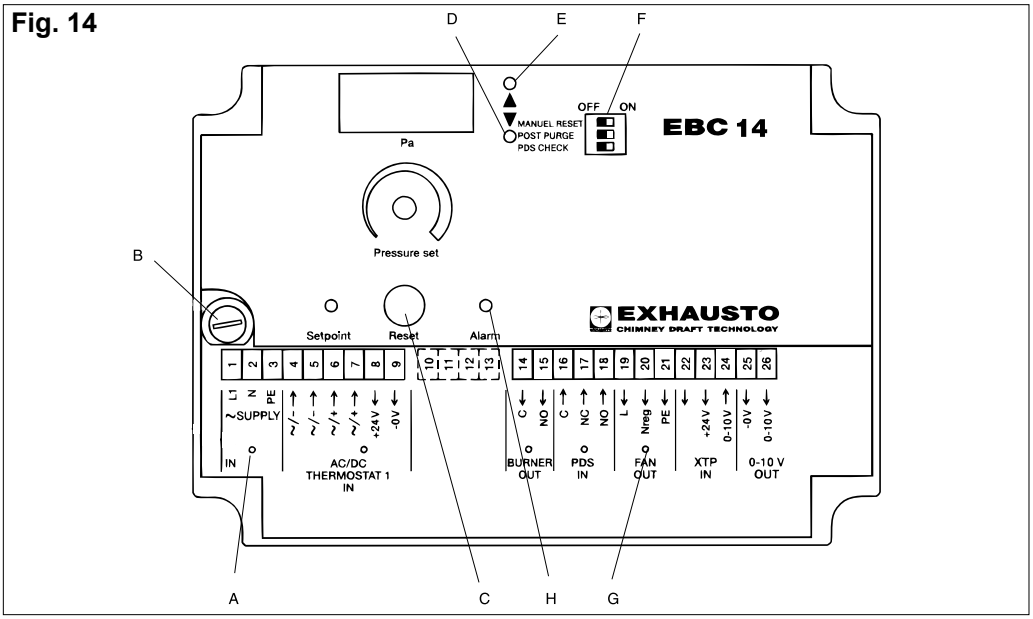


6. Maintenance and Troubleshooting

Observation	Problem	Solution
No light in the SUPPLY diode (Fig 14-A)	Blown fuse or interrupted power supply	1) Check the fuse (Fig. 14-B) and the fan power supply. 2) Check the power supply.
Constant light in "Increasing Speed" diode (Fig 14-E)	System fault	1) Check that the probe is connected to the "-" port on the XTP transducer. 2) Check that the probe is not clogged. **CAUTION: Do not blow into the XTP-transducer.** 3) Check that the fan is running. 4) Check duct for leakages. 5) Check the power supply to the XTP.
Constant light in "Decreasing Speed" diode (Fig. 14-D)	System fault	1) The room is in a constant pressurized mode, or the minimum speed is set too high on the Variable Frequency Drive (VFD). 2) The probe may be in a bad location. Move it to another position closer to the appliance.
Constant light in ALARM diode (Fig. 14-H), but no light in FAN diode (Fig 14-G) (Can only occur when MANUAL RESET is ON (Fig 14-F))	Power outage	Press the RESET button (Fig. 14-C) for (1) second — see warning.
Constant light in Alarm diode and light in fan diode (Fig. 14-G)	Insufficient draft	1) Press the RESET button (Fig. 14-C) — see warning. 2) Check that the repair switch is working properly. 3) Check the duct and fan interior blocking instructions.
The EBC 14 does not regulate and the fan is running at full speed	The neutral connection is shared with other devices	1) Check the amp-draw on terminal Nreg. If it is "0", the neutral connection to the fan is being shared.

Some appliances require a certain startup procedure after a shutdown. Follow this procedure prior to pressing the RESET button (Fig. 14-C).

Fig. 14



Notes

DK: EU-Overensstemmelseserklæring **GB: Declaration of Conformity** **D: EU-Konformitätserklärung** **F: Déclaration de conformité de l'Union Européenne**	**N: EU-Overensstemmelseserklæring** **NL: EU-Konformiteits verklaring** **S: EU-Överensstämmelsedeklaration** **SF: EU-Vaatimustenmukaisuusvakuutus** **IS: ESS-Samræmisstaðfesting**
EXHAUSTO A/S Odensevej 76 DK-5550 Langeskov DANMARK	
erklærer på eget ansvar, at følgende produkter: declare on own resposibility that the following products: Verantwortet, daß folgende Produkte: déclare sous sa propre responsabilité que le produit suivant:	erklærer på eget ansvar, at følgende produkter: veklaard dat onderstaande produkten: deklarerar på eget ansvar, att följande produkter: vastaa siltä, että seuraava tuote: Staðfesti à eigin àbyrgð, að eftirfarandi vörur:
EBC 12, EBC 14	
som er omfattet af denne erklæring, er i overensstemmelse med følgende standarder: covered by this declaration, are in conformity with the following standards: mit den folgenden Standardbezeichnungen: auquel s'applique cette déclaration est en conformité des normes mentionnées ci-dessous:	som er omfattet av denne erklæring, er i overensstemmelse med følgende standarder: met de onderstaande standard koderingen: som omfattas av denna deklaration, överensstämmer med följende standarder: joka koostuu tästä selvityksestä, on seuraavien standardien mukainen: sem eru meðtalin i staðfestingu Pessari, eru i fullu samræmi við eftirtalda staðla:
EN60 335-1, EN60 335-2-80, DS/EN ISO 12100-1:2003, DS/EN ISO 12100-2:2003	
i.h.t bestemmelser i direktiv: according to conformaty in directive: gemaß folgenden EU-Richtlinien überstimmen: suivant les dispositions prévues aux directives:	i.h.t bestemmelser i direktiv: voldoen aan de heironder gestelde eisen: enlgt bestämmelserna i följende direktiv: seuraavien direktiivin määräysten mukaan: med tilvisun til àkvarðana eftirlits:
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73/23	
EMC-direktivet: EMC Directive: für EMC: La directive de la compatibilité électromagnétique:	EMC-direktivet: voor EMC: EMC-direktivet: EMC-direktiivi: EMC-eftirlitið:
89/336, 92/31	
Langeskov, 01.03.2005 Adm. direktør Managing Director Geschäftsführer, Inhaber Président-directeur général Peter Hermansen Peter Hermansen	

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