

UK

## CFI 300 -500 Inline fan

Read and save these instructions!

**exodraft**

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### 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.
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
5. This unit must be grounded.
6. Installation of a CO alarm is recommended in the boiler-room.

Accessories 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 **exodraft** CFI Inline fan is intended for use as a true in-line draft inducer. It can be installed in-line in the vertical or horizontal section of the fluepipe. It is specifically designed for applications where reliable and efficient operation, low noise level, low energy consumption, variable speed and compact design are critical.

The CFI is for use with condensing and non-condensing appliances at flue gas temperatures of (300 °C) for continuous operation.

Typical uses are mechanical venting of gas-fired or oil-fired boilers and water heaters. The CFI is for indoor or outdoor installation where ambient temperatures are in the range of -40 °C to 50 °C.

### Construction

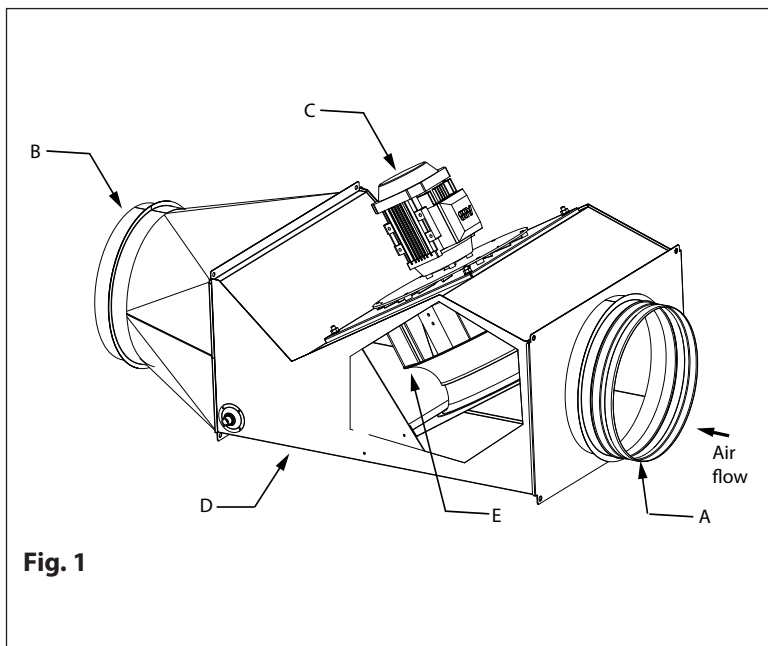
The CFI Inline fan is an efficient, high-temperature ventilator with backward-inclined impeller of cast aluminum. The ventilator housing is made of stainless steel (316L) and equipped with an energy-efficient, totally enclosed, variable speed motor with sealed and permanently lubricated bearings. The motor and impeller is a complete assembly (drive unit) that can be removed from the fan housing without removing the fan from the stack system. The stack connections fit most commercial pre-fabricated chimney systems.

### Restrictions

The CFI Inline fan should only be used with appliances operating on Natural Gas, LP-Gas/Butane or fuel oil. It should never be used with incinerators or solid-fuel burning equipment. The temperature of the flue gases going through the Inline fan should not exceed 300 °C.

The CFI is not suitable for pulsating boilers.

### 1.2 Components



- A. Inlet
- B. Outlet
- C. Motor
- D. Housing
- E. Impeller

### 1.3 Shipping

The CFI is shipped on a pallet covered by a cardboard box.

#### **Standard packing list**

The CFI is shipped with drain installation kit.

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

### 1.4 Warranty

**exodraft** provides a two-year factory warranty on its flue gas fans, valid from invoice date.

**exodraft** fans must be installed by competent personnel.

**exodraft** reserves the right to introduce changes to these guidelines without prior notice.

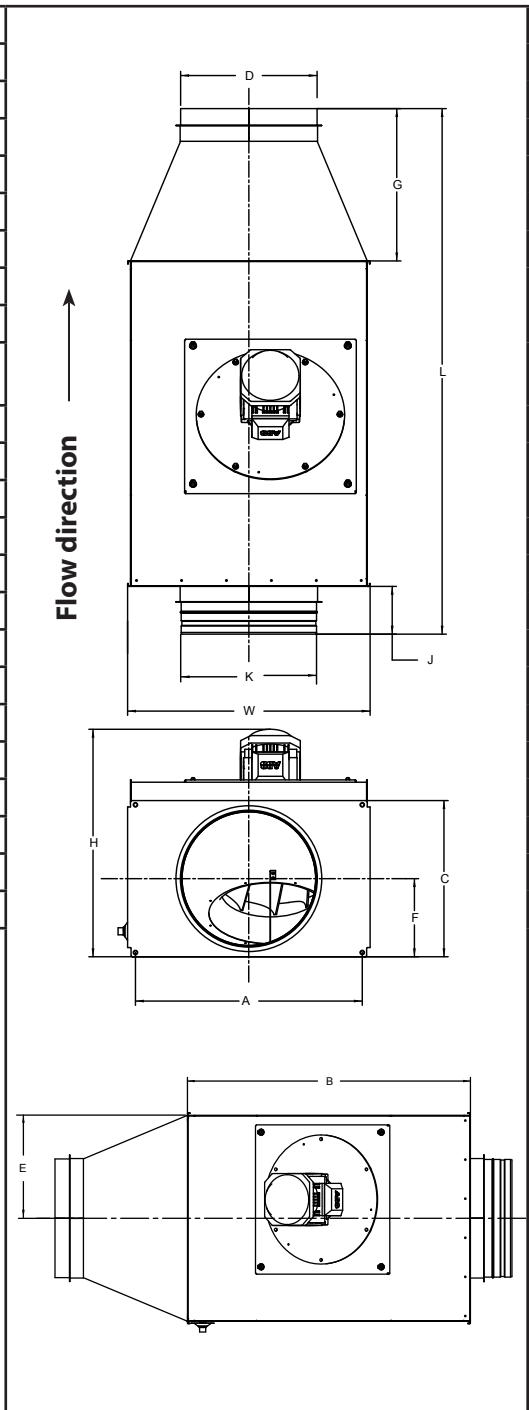


## 2. Specifications

### 2.1 Dimensions

exodraft In-line Fan Model		CFI 300	CFI 350	CFI 400	CFI 500
Fan Type		Centrifugal Impeller (B-wheel)			
Motor Type		TEFC			
Voltage	VAC	1 x 230		3 x 230	
Frequency	Hz	50			
Amperage	Amps	1.8	2.3	5.5	7.8
Motor	Output HP	0.4	1.0	2.0	3.0
	kW	0.3	0.75	1.5	2.2
Max. RPM		1350	1300	1680	1730
Duct Connection (Nominal)	mm	300	350	400	500
Dimensions	A mm	492	572	672	752
	B mm	730	833	963	1118
	C mm	363	403	463	572
	D* mm	303	353	403	503
	E mm	270	310	360	400
	F mm	182	202	232	286
	G mm	393	392	402	502
	H mm	553	630	674	766
	J mm	46	46	46	46
	K* mm	301	351	401	501
	L mm	1316	1418	1558	1813
	W mm	539	619	719	799
	Weight	kg	34	42.5	58
Max. Temperature		300 °C Continuous			

Dimension D is **inner** diameter of the connection.  
Dimension K is **outer** diameter of the connection.





### 3. Mechanical installation

#### 3.1 General



##### WARNING

Failure to install, maintain and/or operate the exodraft CFI Inline fan in accordance with the manufacturer's instructions may result in conditions which can produce bodily injury and property damage.

The CFI must be installed by a qualified installer in accordance with these instructions and all local codes.

**See national legislation on distance to inflammable materials.**

Preferably, the CFI should be installed as close to the termination as possible. It can also be installed near the outlet of a heating appliance in the breeching itself. In addition, it can be used for sidewall vented applications where it discharges through a wall. A drain is provided with the CFI to be installed by the user.

The CFI is for indoor and outdoor installation. Unless installed adjacent to the wall it is discharging through, the chimney material used on the discharge side must be airtight/pressure rated. The flue pipe must be installed and supported according to the chimney manufacturer's instructions and/or in accordance with all local codes.

#### 3.2 Positioning

Acceptable fan positions are shown below in fig. 2. If mounted horizontally, we recommend that the motor be positioned to the side as shown in fig. 2, position C.

**The CFI must be mounted to provide clear and easy access to the motor and impeller assembly.**

##### NOTE

\*If the CFI is mounted in position B or C, a drain must be installed as described in Section 3.3.

\*If the CFI is oriented as shown in position B, the resulting axial load on the bearings may shorten the life of the motor.



##### WARNING

Never install the Inline fan so the motor points down. This will shorten the lifetime and cause a risk of leakage.

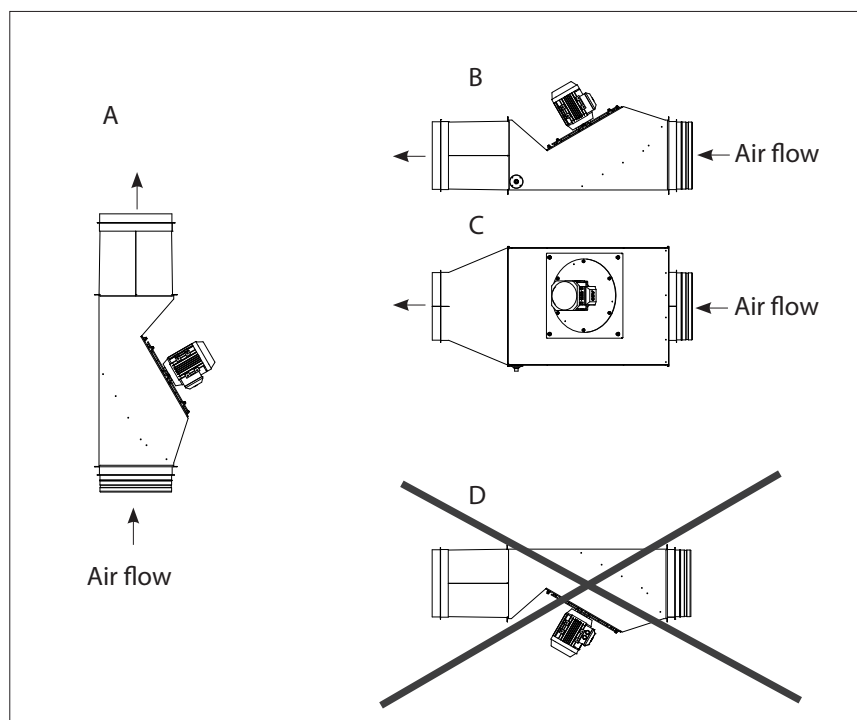
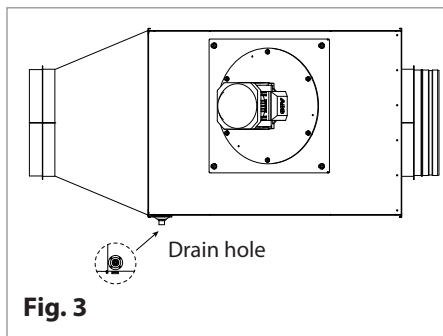


Fig. 2



### 3.3 Drain installation

Install the provided drain if the CFI is mounted in position B or C. The drain should be installed near the outlet of the fan and oriented so it points toward the ground.



To install the drain:

Use the drain as a template to drill 4 x  $\varnothing 5$  mm holes in each corner.

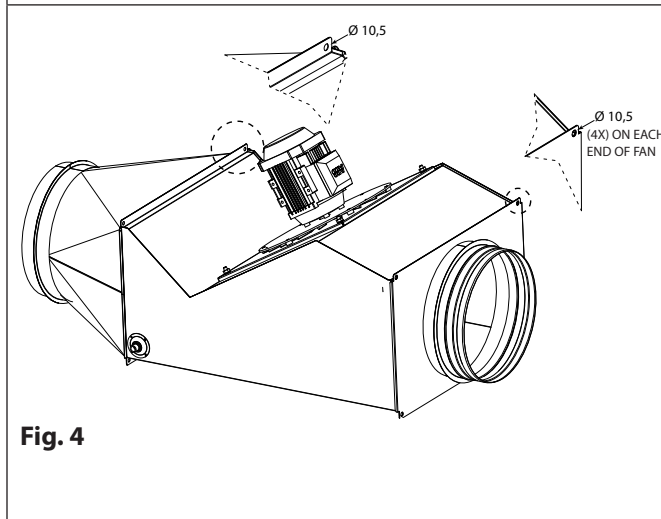
Use the 4 provided rivets to fasten the drain to the fan housing.

Using the fitting as a guide, drill a  $\varnothing 13$  mm hole through the housing to open the drain.

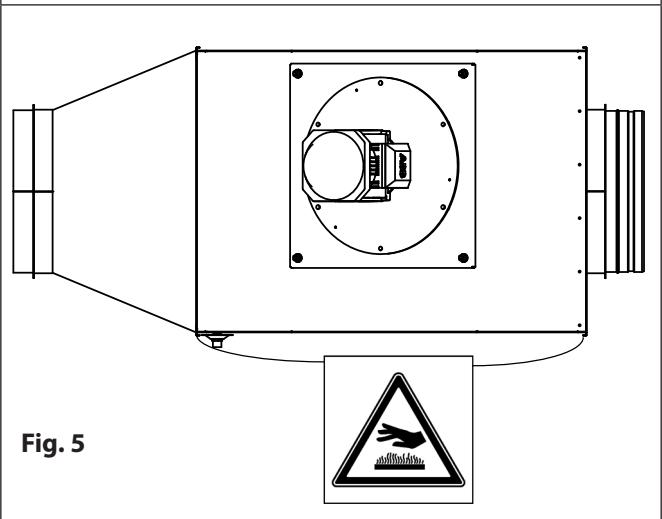
Remove burrs inside the housing to ensure the water to run freely through the hole

### 3.4 Mounting of inline fan

The CFI has 4 x  $\varnothing 10.5$  mm mounting holes on each end of the fan. Threaded rod or steel hangers should run through these holes to hang the fan from the ceiling or other support.

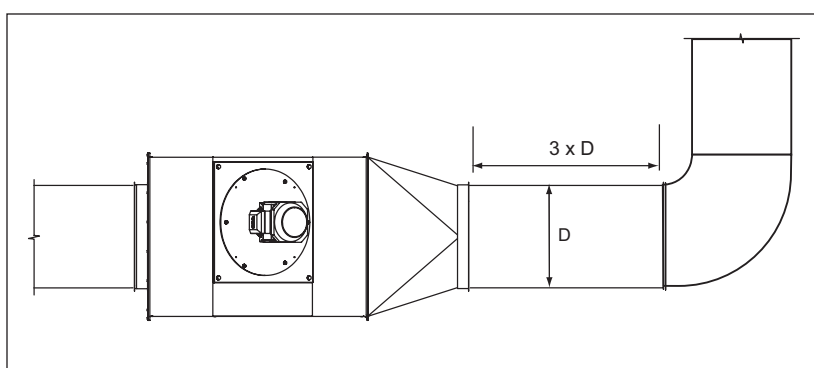


To prevent accidental contact with the hot surfaces the supplied warning signs for "Hot surface" should be placed on the cabinet. Follow supplied instruction with the warning sign.



### 3.5 Location/connections

Follow the recommendations by the vent or stack manufacturer. The Inline fan should be located at least (3) times the vent diameter from any elbow or tee.





### 3.6 Vertical installation

To mount the CFI vertically, suspend the Inline fan with threaded rod. Once the position of the fan and rods is finalized, hang 4 pieces of threaded rod through the mounting holes of the fan as shown in fig. 7. (On back side of fan, run threaded rod through both top and bottom mounting holes.) Once the Inline fan is leveled, secure the rod with lock washers and locking hex nuts. (A tack weld may be placed on the hex nuts for permanent fixation).

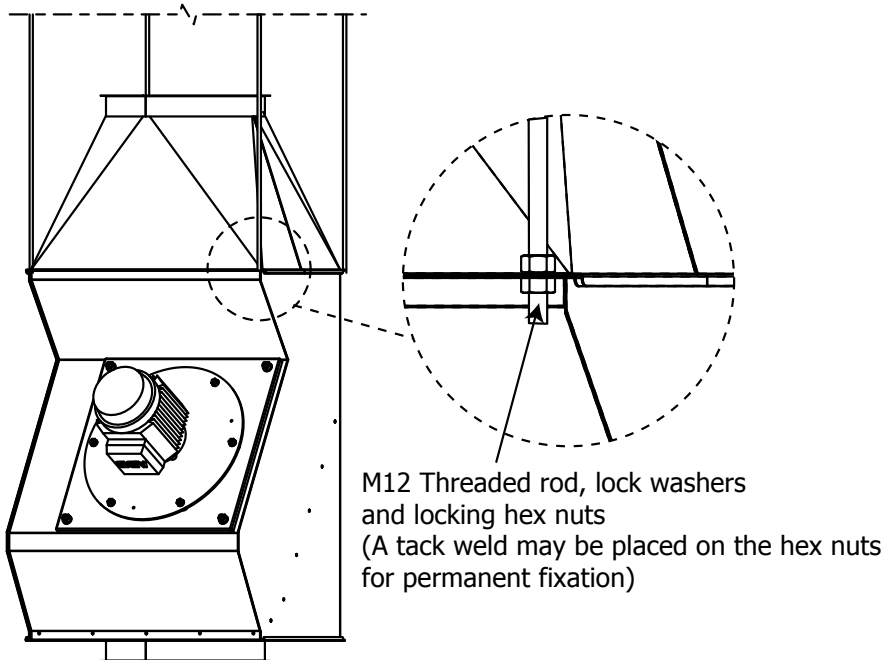


Fig. 7

### 3.7 Horizontal installation

To mount the CFI horizontally, suspend the Inline fan with threaded rod or steel hangers. It may be necessary to cross brace the fan from end to end to prevent side sway. Ensure the fan is level before permanently securing.

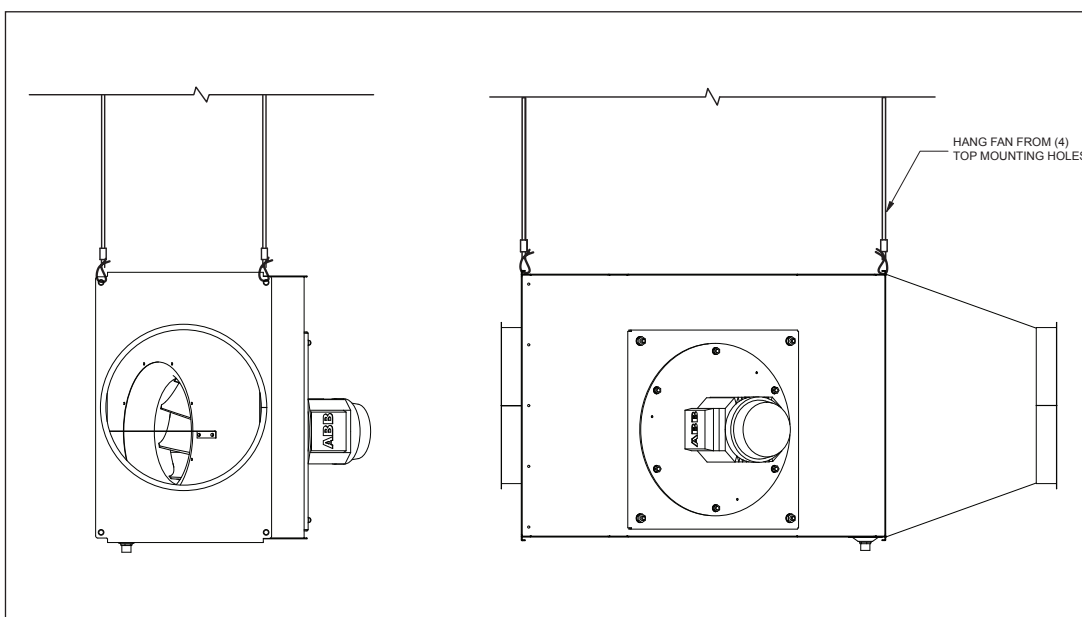


Fig. 8



#### NOTICE

If you incidentally are able to touch the CFI in operation there should be mounted a cover to prevent getting burnt.



## 4. Electrical installation

### 4.1 General



#### DANGER

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



#### NOTICE

If any of the original wire supplied with the system must be replaced, use similar wire of the same temperature rating. Otherwise, insulation may melt or degrade, exposing bare wire.

The frequency must not be set to more than 60 Hz. Max. revolutions (rpm) are described in section 2.1.

The power supply cable must be attached firmly to avoid contact with hot housing parts.

It is recommended to install a motor over current protection device.  
To regulate the CFI400 and CFI500 an exodraft inverter must be connected.

All wiring must be in compliance with the local codes.

**exodraft** CFI models operate at different voltages, please pay attention to the wiring details.  
CFI300 and CFI350 operates at 1 x 230 VAC.  
CFI400 and CFI500 operates at 3 x 230 VAC .  
This is indicated by the terminal wire configuration in the motor junction box. See Section 4.2 & 4.3

### 4.2 Wiring diagram – CFI 300 & CFI 350

Inline fan and motor specifications can be found under *Section 2.1 Dimensions*. The Inline fan is equipped with a variable speed motor.

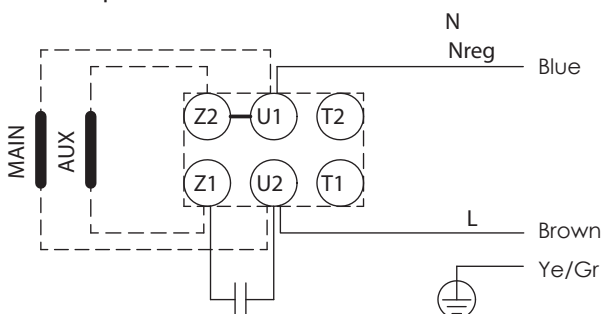


Fig. 9

#### Isolation switch:

In accordance with the provisions of the EU Machinery Directive\* a combustion-gas fan must always have an isolation switch fitted. The isolation switch must comply with national wiring standards.

\*Please refer to Machine Directive (2006/42/EF/-EEC/-EWG/-CEE) – Appendix 1 item 1.6.3 “Separation of the sources of energy”

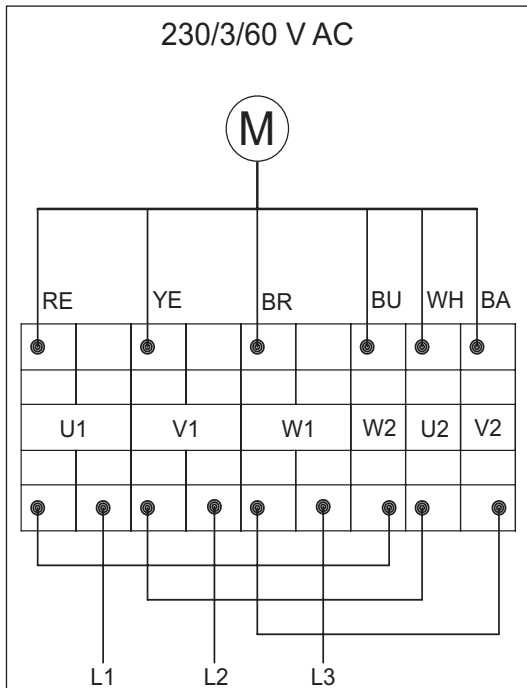
The isolation switch must be ordered separately, as it is not part of the standard **exodraft** chimney fan delivery.



### 4.3 Wiring Diagram – CFI 400-500

CFI 400 and CFI 500 requires 3 x 230 V AC.

The diagram shows the correct wiring in the connection box on the motor.



**Fig. 10**

Inline fan and motor specifications can be found under *Section 2.1 Dimensions*. The Inline fan is equipped with a variable speed motor.

Use cable gland size M25 at the junction box on the motors

### 4.4 Checking and changing rotation of CFI 400 and 500

To check the rotation of the impeller, it is necessary to see the rotation of the cooling vanes at the end of the motor housing.

Correct rotation direction is also indicated by an arrow on the motor end cover. There are holes in the end cover that allow you to see the cooling vanes, but it is difficult to see the rotation unless the fan is running very slowly.

It is possible for the fan to operate with improper rotation. However, the fan will only provide 25-30 % of full capacity. Improper rotation damages the motor, and causes various electrical faults at the variable frequency converter.

Change of rotation is carried out by changing two of the wires at the frequency converter. See wiring diagram delivered with the frequency converter.



#### **DANGER**

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

## 5. Startup and configuration

### 5.1 General

The purpose of this **exodraft** CFI inline fan is to ensure safe venting for a single appliance or multiple appliances. This can be performed via modulation, or through a single speed where modulation is not required. This is accomplished by starting the fan when the appliance calls for heat, and stopping the fan when the heat demand has been satisfied.

### 5.2 System testing



#### WARNING

**Do not start the CFI before it is safely mounted on the chimney stack.  
Beware of rotating parts.**

1. Check the line voltage with the motor name plate rating.
2. Determine if the impeller is running free, and has not be subjected to misalignment in shipping or during installation.
3. Apply power, and check that the impeller is rotating in the direction of the arrow on the side of the motor housing (does not apply to CFI 300, 350). All **exodraft** fans run in a **clockwise** direction when viewed looking from the motor side.
4. Switching any two phases between the fan and the frequency converter will reverse rotation

### 5.3 Adjusting fan speed

Start all heating appliances connected to the chimney with the fan installed.

1. If operating with fixed speed, set the fan speed control or the variable frequency drive to the speed where no spillage is experienced anywhere in the system.

If operating with variable speed, a modulating control is required. Please contact your **exodraft** provider for advice regarding fan controls and follow the instructions in the control's installation manual.

### 5.4 Testing safety system

If a safety system is installed, please refer to the controls manual.



## 6. Maintenance and troubleshooting

### 6.1 General

The **exodraft** Inline fan is designed for prolonged use, and no regular maintenance is required. This specifically applies in case it is being used with fuel oil. The Inline fan is designed to make this an easy task. The front part of the venter has the motor and impeller mounted on it, and it slides out to provide easy access.

The run capacitor is considered a wear part and will need to be replaced depending on usage.

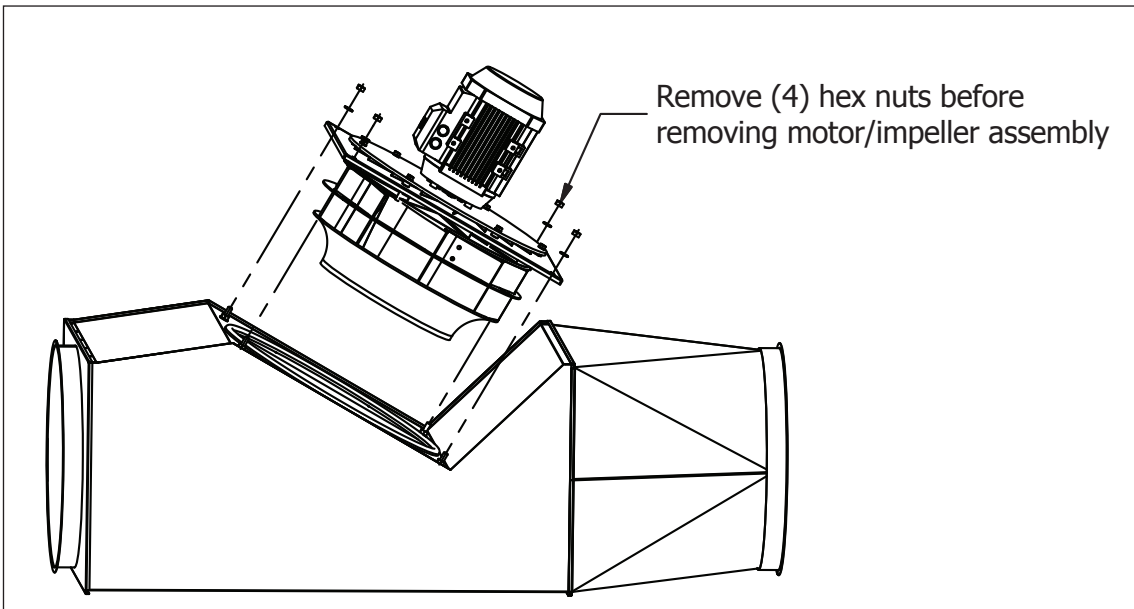


**The CFI should be inspected periodically (at least once a year) for leakage, and cleaned, if needed.**

### 6.2 Preparing the inline fan for cleaning

Referring to fig. 11 below, follow these steps to open the CFI inline fan so it can be cleaned and inspected:

1. Use removable lifting eyes for disassembly and assembly of motor section. (CFI300 & CFI350)
2. Remove the four hex nuts holding the motor mounting plate to the housing.
3. Motor and impeller assembly can be lifted out of the housing. See table listing weights for each model.
4. Clean the impeller and inside of the housing as needed.
5. Replace the motor and impeller assembly and tighten hex nuts to secure motor section.



**Fig. 11**

#### NOTE

The approximate weights of the CFI motor/impeller assemblies are as follows:

CFI300-41 19 Kg

CFI350-41 21 Kg

CFI400-42 32 Kg

CFI500-42 48 Kg



#### WARNING

Do not open the housing unless power to the CFI Inline fan has been disconnected from power supply.



### 6.3 Troubleshooting


Problem	Possible Cause	Solution
<b>The fan is not operating</b>	<ul style="list-style-type: none"> <li>- No power to the fan</li> </ul>	<ul style="list-style-type: none"> <li>- Check the power supply wires in the junction box by the fan.</li> <li>- Check the circuit breaker.</li> <li>- Check that the fan is actually turned on.</li> </ul>
<b>The fan is rotating backwards (except CFI 300 &amp; CFI 350)</b>	<ul style="list-style-type: none"> <li>- Phase sequence in the power to the fan is reversed</li> </ul>	<ul style="list-style-type: none"> <li>- Swap two phases between the frequency converter and the fan</li> </ul>
<b>The fan is vibrating vigorously</b>	<ul style="list-style-type: none"> <li>- Foreign matter is stuck in the impeller.</li> <li>- A ball bearing is damaged.</li> <li>- A balancing weight has fallen off impeller</li> </ul>	<ul style="list-style-type: none"> <li>- Remove the transportation device.</li> <li>- Turn off the fan and remove the foreign matter.</li> <li>- Turn the fan off. After the motor has stopped revolving, spin the impeller and listen for a grinding noise from the motor. If necessary, replace bearing or entire motor.</li> <li>- Re-balance impeller or replace it. Check motor for damages.</li> </ul>
<b>The fan stops in the middle of firing cycle</b>	<ul style="list-style-type: none"> <li>- The motor is over-heating</li> </ul>	<ul style="list-style-type: none"> <li>- Check the flue gas temperature at the fan inlet. The temperature should not exceed 300 °C during continuous operation. Call <b>your supplier</b> for advice.</li> </ul>



## 7. EU declaration of Conformity

### Declaration of Conformity



<b>DK: EU-Overensstemmelseserklæring</b> <b>GB: Declaration of Conformity</b> <b>DE: EU-Konformitätserklärung</b> <b>FR: Déclaration de conformité de l'Union Européenne</b> <b>NO: EU-Samsvarserklæring</b> <b>PL: EU Deklaracja zgodności</b>	<b>NL: EU-Conformiteits verklaring</b> <b>SE: EU-Överensstämmelsedeklaration</b> <b>FI: EU-Vaatimustenmukaisuusvakuutus</b> <b>IS: ESS-Samræmisstaðfesting</b> <b>IT: Dichiarazione di Conformità Unione Europea</b>
<b>exodraft a/s</b> <b>C.F. Tietgens Boulevard 41</b> <b>DK-5220 Odense SØ</b>	
-erklærer på eget ansvar, at følgende produkter: -hereby declares that the following products: -erklärt hierdurch auf eigene Verantwortung, daß folgende Produkte: -déclare, sous sa propre responsabilité, que les produits suivants: -erklærer på eget ansvar at følgende produkter: -niniejszym oświadczam, że następujące produkty:	-veklaart dat onderstaande producten: -deklarerar på eget ansvar, att följande produkter: -vastaa siltä, että seuraava tuote: -Staðfesti à eigin ábyrgð, að eftirfarandi vörur: -dichiara con la presente che i seguenti prodotti:
<b>CFI300-41, CFI350-41, CFI400-42, CFI500-42</b>	
-som er omfattet af denne erklæring, er i overensstemmelse med følgende standarder: -were manufactured in conformity with the provisions of the following standards: -die von dieser Erklärung umfaßt sind, den folgenden Normen: -auxquels s'applique cette déclaration sont en conformité avec les normes ci-contre: -som er omfattet av denne erklæring, er i samsvar med følgende standarder: -zostały wyprodukowane zgodnie z warunkami określonymi w następujących normach:	-zijn vervaardigd in overeenstemming met de voorschriften uit de hieronder genoemde normen en standaards: -som omfattas av denna deklARATION, överensstämmer med följande standarder: -jota tämä selvitys koskee, on seuraavien standardien mukainen: -sem eru meðtalin í staðfestingu Pessari, eru í fullu samræmi við eftirtalda staðla: -sono stati fabbricati in conformità con le norme degli standard seguenti:
<b>EN60335-1, EN60335-2-80, DS/EN ISO 12100: 2012</b>	
-i.h.t bestemmelser i direktiv: -in accordance with -entsprechen gemäß den Bestimmungen der folgenden Richtlinien: -suivant les dispositions prévues aux directives: -i.h.t bestemmelser i direktiv: -zgodnie z:	-en voldoen aan de volgende richtlijnen: -enligt bestämmelserna i följande direktiv: -seuraavien direktiivien määräysten mukaan: -med tilvisun til ákvarðana eftirlits: -in conformità con le direttive:
-Maskindirektivet: -the Machinery Directive: -Richtlinie Maschinen: -Directive Machines: -Maskindirektivet: -Dyrektywę maszynową:	-de machinerichtlijn: -Maskindirektivet -Konedirektiivi: -Vælaeftirlitið: -Direttiva Macchinari:
<b>2006/42/EF/-EEC/-EWG/-CEE</b>	
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<b>2006/95/EC</b>	
-EMC-direktivet: -and the EMC Directive: -EMV-Richtlinie: -Directive Compatibilité Electromagnétique: -EMC-direktivet: -Dyrektywę EMC – kompatybilności elektromagnetycznej	-en de EMC richtlijn: -EMC-direktivet: -EMC-direktiivi: -EMC-efirlitið: -Direttiva Compatibilità Elettromagnetica:
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Odense, 01.05.2013  -Adm. direktør -Managing Director  Jørgen Andersen 	-Algemeen directeur -Geschäftsführender Direktor -Président Directeur Général -Verkställande direktör -Toimitusjohtaja -Frankvemdastjóri -Direttore Generale





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**DK: exodraft a/s**

C. F. Tietgens Boulevard 41  
DK-5220 Odense SØ  
Tel: +45 7010 2234  
Fax: +45 7010 2235  
info@exodraft.dk  
www.exodraft.dk

**SE: exodraft a/s**

Kasten Rönnowsgatan 3B 4tr  
SE-302 94 Halmstad  
Tlf: +46 (0)8-5000 1520  
info@exodraft.se  
www.exodraft.se

**NO: exodraft a/s**

Storgaten 88  
NO-3060 Svelvik  
Tel: +47 3329 7062  
info@exodraft.no  
www.exodraft.no

**UK: exodraft Ltd.**

10 Crestway, Tarleton  
GB-Preston PR4 6BE  
Tel: +44 (0)1494 465 166  
Fax: +44 (0)1494 465 163  
info@exodraft.co.uk  
www.exodraft.co.uk

**DE: exodraft GmbH**

Soonwaldstraße 6  
DE-55569 Monzingen  
Tel: +49 (0)6751 855 599-0  
Fax: +49 (0)6751 855 599-9  
info@exodraft.de  
www.exodraft.de