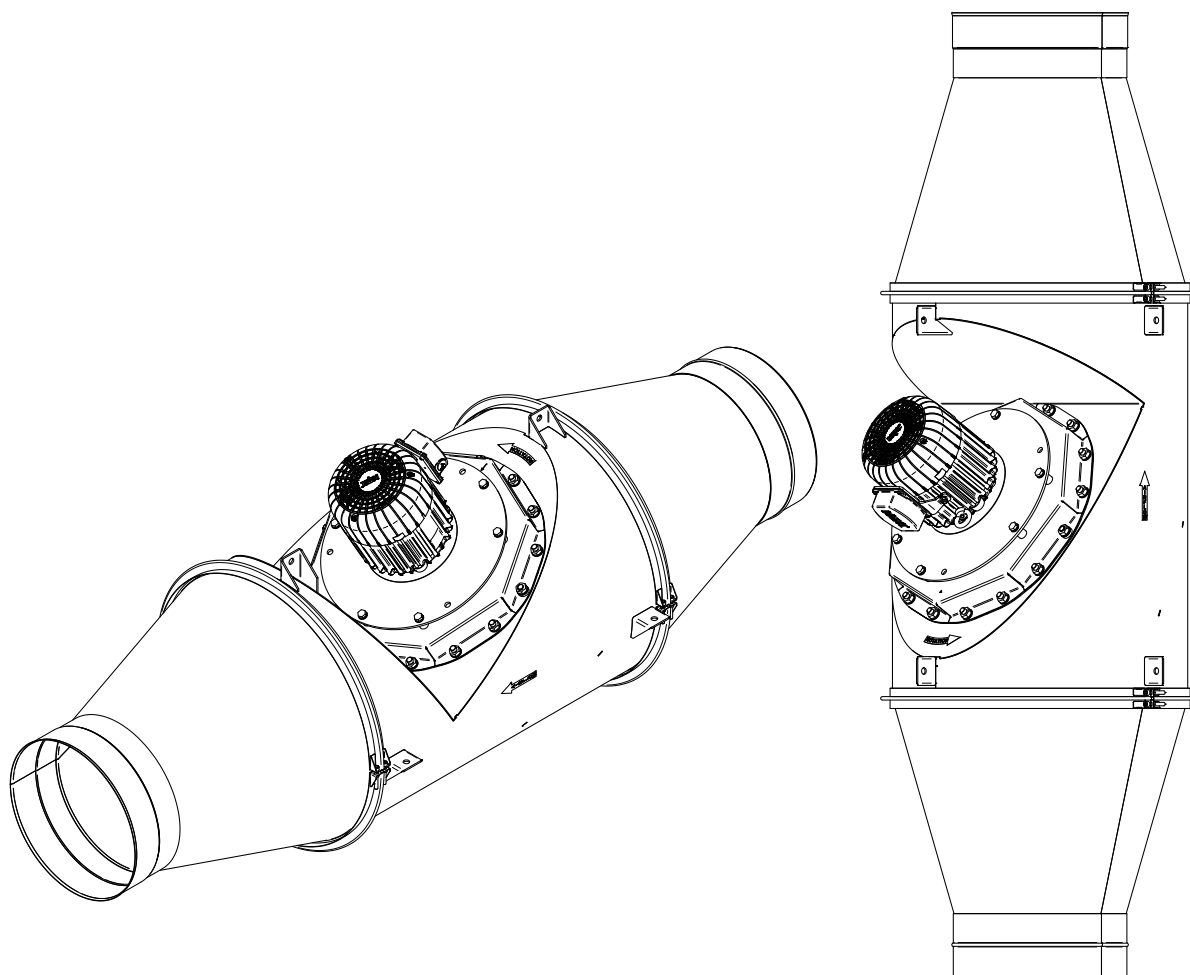




UK

CFIR 200-500 Inline fan

Read and save these instructions!

exodraft

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Symbol legend

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



Danger

Indicates a hazardous situation which, if not avoided, may result in death, serious injury or substantial material damage.



Caution

Indicates a 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 the service panel and lock the panel to prevent power from being switched on accidentally.
3. Installation work and electrical wiring must be done by qualified personnel 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 the individual manuals of these components.

1. Product information

1.1 Function

Use The **exodraft** CFIR Inline fan is intended for use as a true inline draught inducer. It can be installed “in line” of the vertical or horizontal section of the flue. 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 CFIR is for use with condensing and non-condensing appliances operating at a maximum flue gas temperature of 600 °C.

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

Construction The CFIR Inline fan is an efficient, high-temperature ventilator with backward-inclined impeller of stainless steel. 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 CFIR 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 600 °C.

The CFIR is suitable for pulsating boilers.

1.2 Components

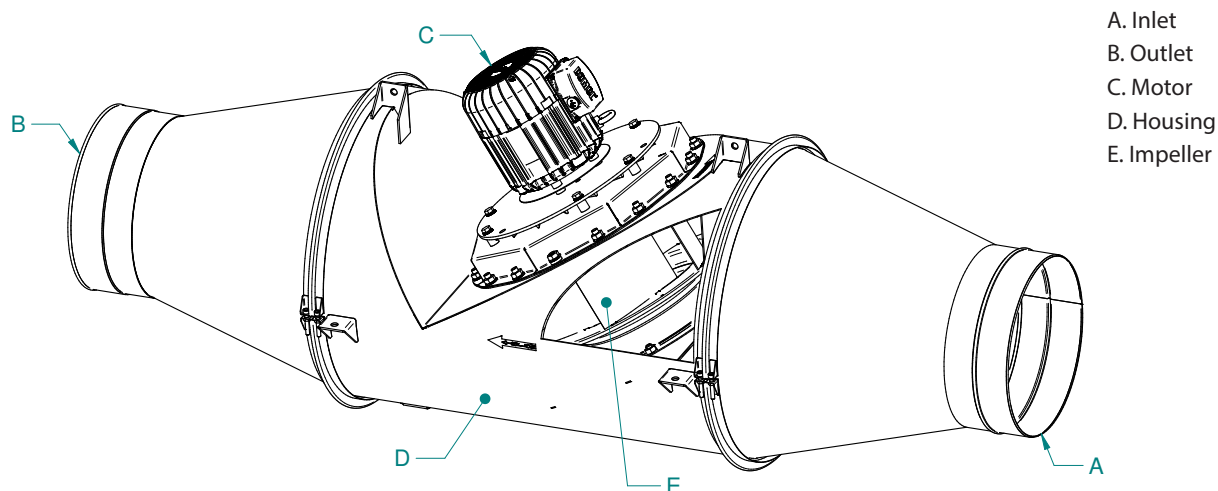


Fig. 1

1.3 Shipping

The CFIR is shipped on a pallet and protected by non-stackable cardboard packaging.

Standard packing list

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

1.4 Warranty

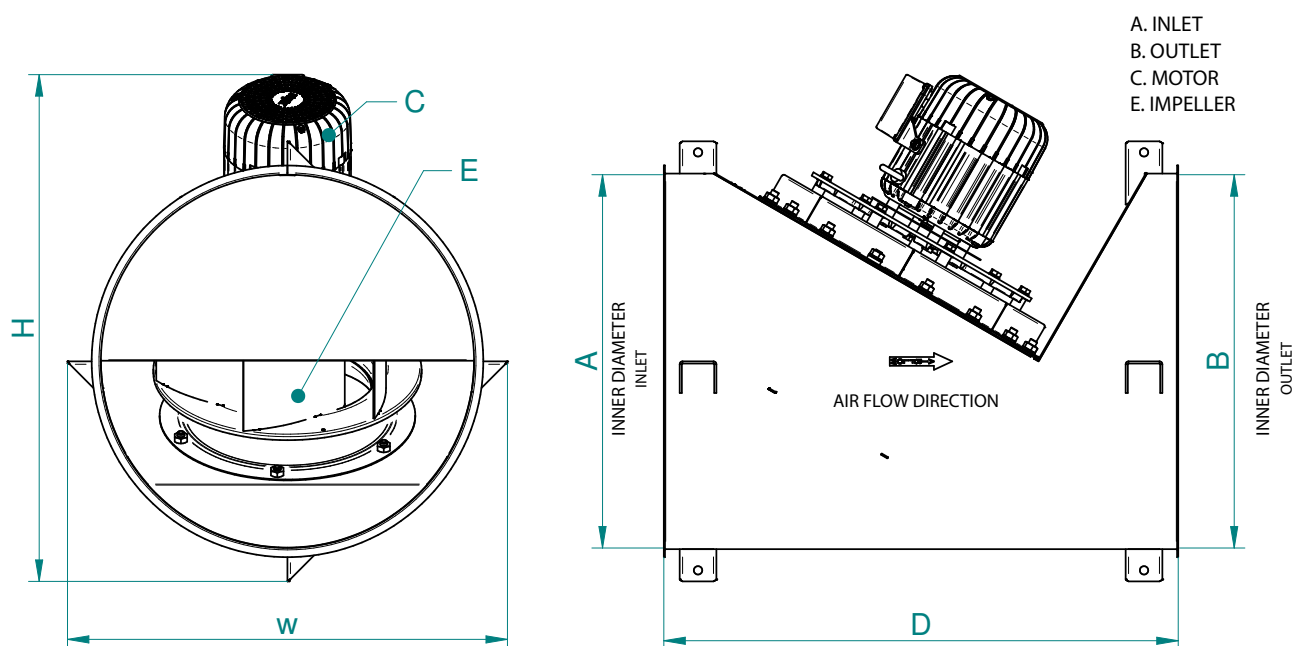
exodraft provides a two-year factory warranty on its flue gas fans, valid from invoice date.

exodraft fans must be installed by qualified personnel.

exodraft reserves the right to introduce changes to these guidelines without prior notice. So keep updated on our website for the latest version of the manual.

2. Specifications

2.1 Dimensions



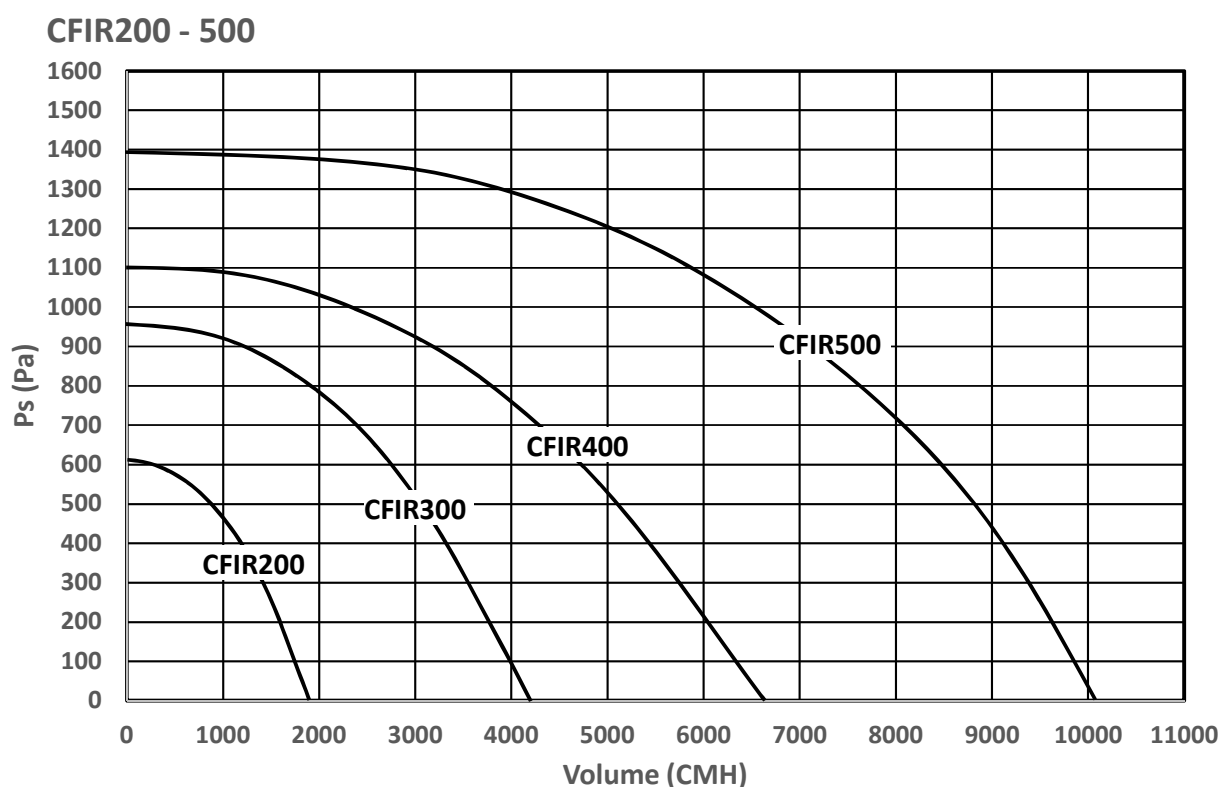
Type	Motor data					Frequency inverter		Dimensions							Temp. rating
	RPM (nominal)	RPM (max.)	Voltage [V]	Power [kW]	Current [A]	Voltage [V]	Current [A]	Weight [kg]	A Ø [mm]	B Ø [mm]	D [mm]	H [mm]	W [mm]	Chimney Ø [mm]	
CFIR200	1750	2400	3 x 208-240 *	0.75	3.3	3 x 208-240	4.3	23	406	406	600	568	491	250 **	Maximum 600 °C
CFIR300	1750	2200	3 x 380-480 *	1.5	3,7	3 x 380-400	5.6	38	508	508	700	662	599	300 **	
CFIR400	1750	1950	3 x 380-480 *	2.2	4,8	3 x 380-400	7.5	56	610	610	850	784	700	400 **	
CFIR500	1750	1950	3 x 380-480 *	3.0	7,3	3 x 380-400	11.5	75	711	711	1000	859	802	500 **	

* exodraft frequency inverter required

** Nominal chimney connection



2.2 Capacity diagram

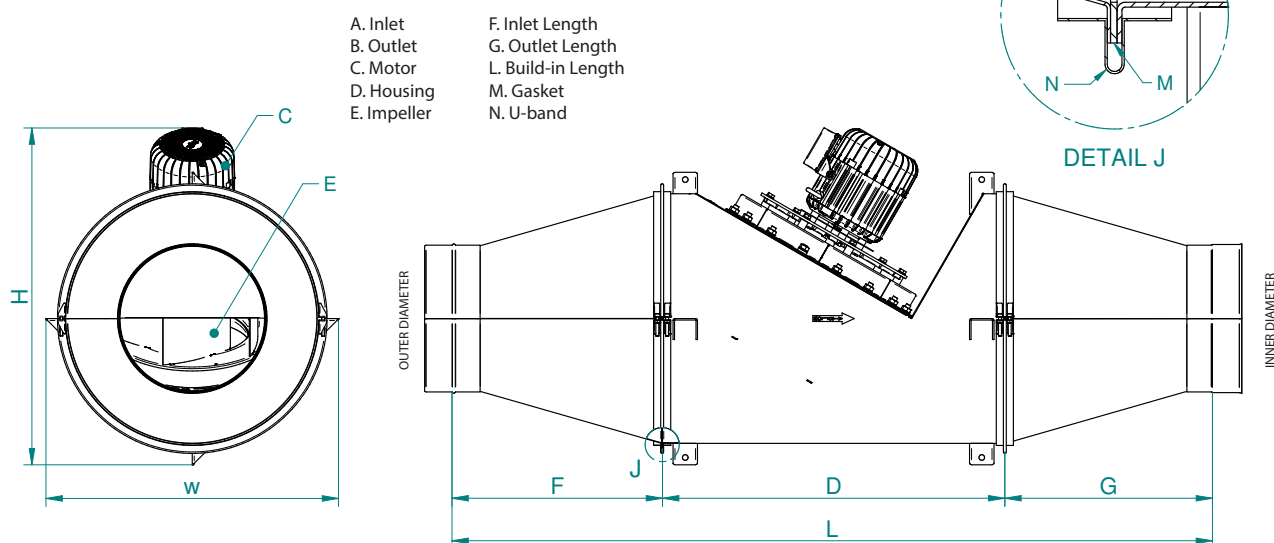


2.3 Frequency Inverter

Type	exodraft itemno.	exodraft Frequency Inverter	Power [kW]	Supply Voltage [VAC]	IP class	Isolation Switch
CFIR200	7500082	FRK-030	0.75	1 x 230	IP20	No
	7500083	FRK-031	0.75	1 x 230	IP66	Yes
CFIR300	7500086	FRK-034	1.5	3 x 400	IP20	No
	7500087	FRK-035	1.5	3 x 400	IP66	Yes
CFIR400	7500086	FRK-034	2.2	3 x 400	IP20	No
	7500087	FRK-035	2.2	3 x 400	IP66	Yes
CFIR500	7500088	FRK-036	4.0	3 x 400	IP20	No
	7500089	FRK-037	4.0	3 x 400	IP66	Yes



3. Configurations



Fan				Cone Inlet	Cone Outlet	U-band	Gasket	Dimensions & Weight									
Model	Motor data							Weight [kg]	A [mm]	B [mm]	D [mm]	F [mm]	G [mm]	H [mm]	L [mm]	W [mm]	Chimney [mm]
	RPM (max)	Voltage [V]	Power [kW]														
1 pcs.				1 pcs.	1 pcs.	2 pcs.	2 pcs.										
CFIR200	2400	3x208-240*	0.75	CFIR200-STUDS250	CFIR200-MUFFE250	CFIR200-UBAND	CFIR200-PAK	30	250.5	251.3	600	338	333	568	1272	491	250**
				CFIR200-STUDS300	CFIR200-MUFFE300			29	300.5	301.3		251	246		1097		
CFIR300	2200	3x380-480*	1.5	CFIR300-STUDS300	CFIR300-MUFFE300	CFIR300-UBAND	CFIR300-PAK	50	300.5	301.3	700	431	426	662	1557	599	300**
				CFIR300-STUDS350	CFIR300-MUFFE350			48	350.5	351.3		343	339		1382		
				CFIR300-STUDS400	CFIR300-MUFFE400			47	400.5	401.3		257	251		1208		
CFIR400	1950	3x380-480*	2.2	CFIR400-STUDS400	CFIR400-MUFFE400	CFIR400-UBAND	CFIR400-PAK	71	400.5	401.3	850	435	429	784	1614	700	400**
				CFIR400-STUDS500	CFIR400-MUFFE500			67	500.5	501.3		260	255		1265		
CFIR500	1950	3x380-480*	3.0	CFIR500-STUDS500	CFIR500-MUFFE500	CFIR500-UBAND	CFIR500	93	500.5	501.3	1000	436	431	859	1867	802	500**
				CFIR500-STUDS600	CFIR500-MUFFE600			89	600.5	601.3		262	257		1519		

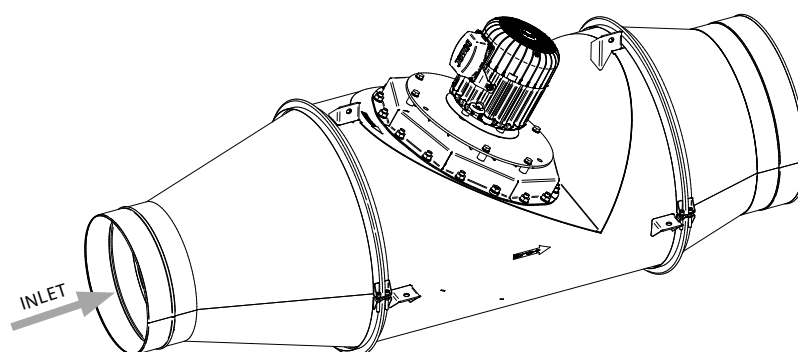
* exodraft frequency inverter required

** Nominal chimney connection

Example of asymmetrical configuration

Small inlet cone with large outlet cone

Fan model	Cone (inlet)	Cone (outlet)	U-band	Gasket
1 pcs.	1 pcs.	1 pcs.	2 pcs.	2 pcs.
CFIR300	CFIR300-STUDS300	CFIR300-MUFFE400	CFIR300-UBAND	CFIR300-PAK





4. Mechanical installation

4.1 General



WARNING

Failure to install, maintain and/or operate the exodraft CFIR Inline fan in accordance with the manufacturer's instructions may result in personal injury or material damage.

The CFIR 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 CFIR should be installed as close to the termination as possible. If this is not possible, installation closer to the outlet of the heating appliance is also acceptable. In addition, it can be used for sidewall vented applications where it discharges through a wall. A drain is provided with the CFIR to be installed by the user.

The CFIR is for indoor and outdoor installation. Unless installed in close proximity 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.

4.2 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 CFIR must be mounted to provide clear and easy access to the motor and impeller assembly.

NOTE

*If the CFIR is mounted in position B or C, a drain must be installed as described in Section 4.3.

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

WARNING



Never install the inline fan so the motor points down. This will shorten the lifespan of the motor and risk leakage.

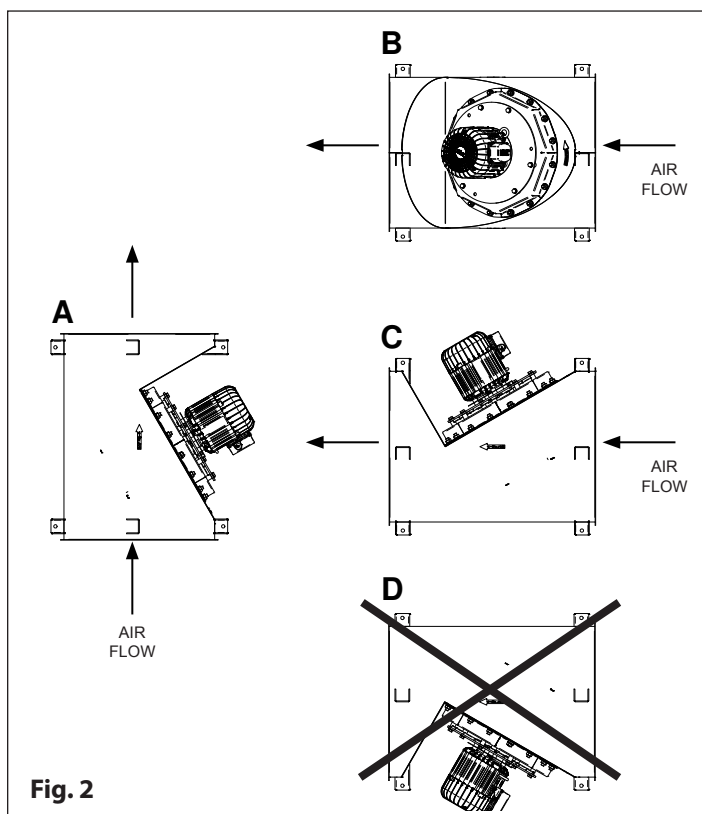
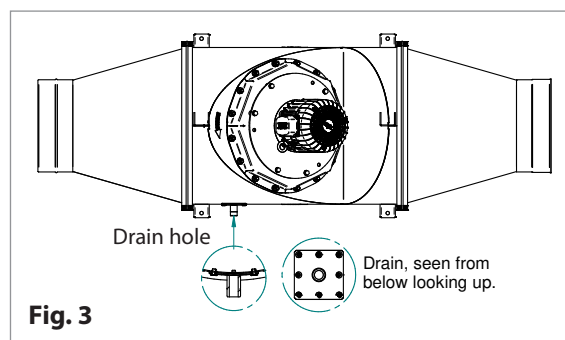


Fig. 2



4.3 Drain installation

Install the provided drain if the CFIR is mounted in position B or C as shown in Fig. 2. The drain should be installed near the outlet of the fan and oriented so it points toward the ground.

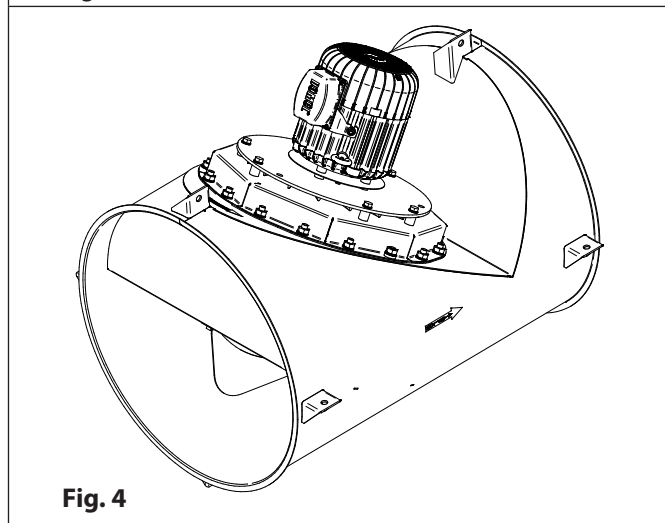


To install the drain:

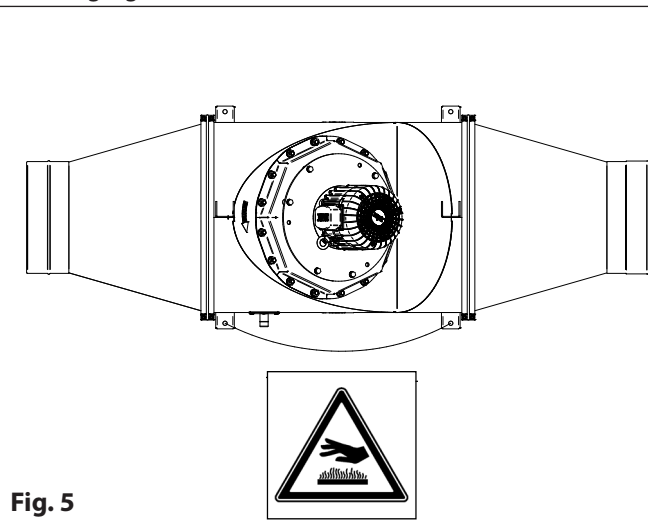
Use the drain as a template to drill 8 x Ø5 mm holes. Before the 8 x Ø5 holes are drilled, make sure that the curved drainplate follows the shape of the outside of the housing. Place the gasket between the drain and the fan housing. Use the 8 provided rivets to fasten the drain to the fan housing. Using the fitting as a guide, drill a Ø12 mm hole through the housing to open the drain. Remove burrs inside the housing to ensure the water to run freely through the hole

4.4 Mounting of inline fan

The CFIR has 4 x Ø10.5 mm mounting holes on each end of the fan. To hang the fan from the ceiling or other support, threaded rods or steel hangers can be run through these holes.

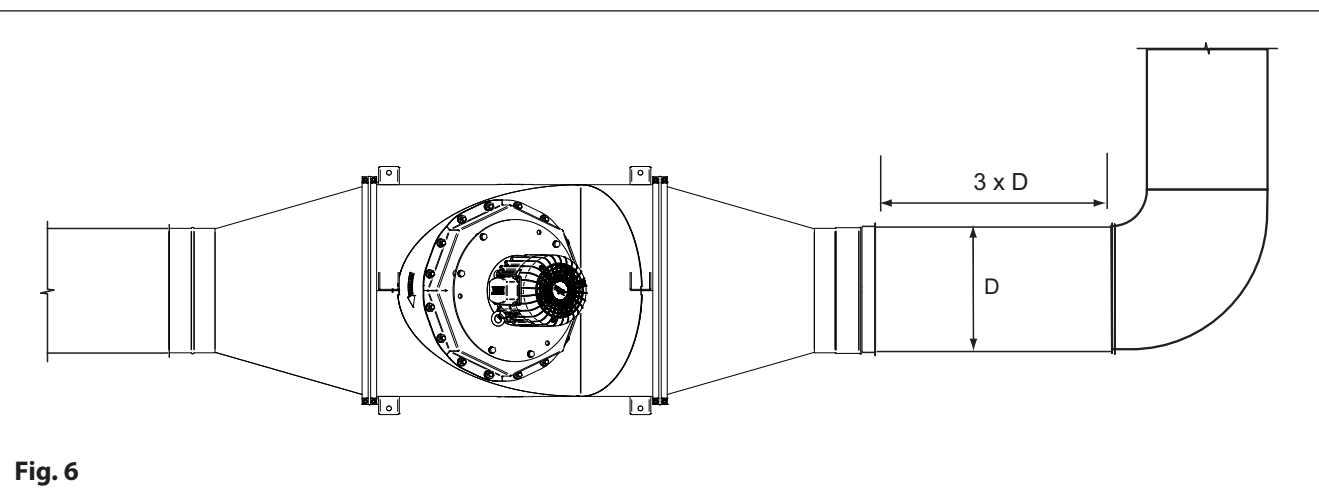


To prevent accidental contact with the hot surfaces, the supplied warning signs for "Hot surface" should be placed on the cabinet. Follow the instructions supplied with the warning sign.



4.5 Location/connections

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



4.6 Vertical installation

To mount the CFIR vertically, suspend the inline fan with steel hangers. Once the position of the power venter and hangers is finalised, attach 2 hangers through the mounting holes of the inline fan as shown in Fig. 7. Once the inline fan is level, secure the hangers. Install additional bracing if necessary.

Ceiling bolts must be properly sized to safely carry the weight of the power venter unit.

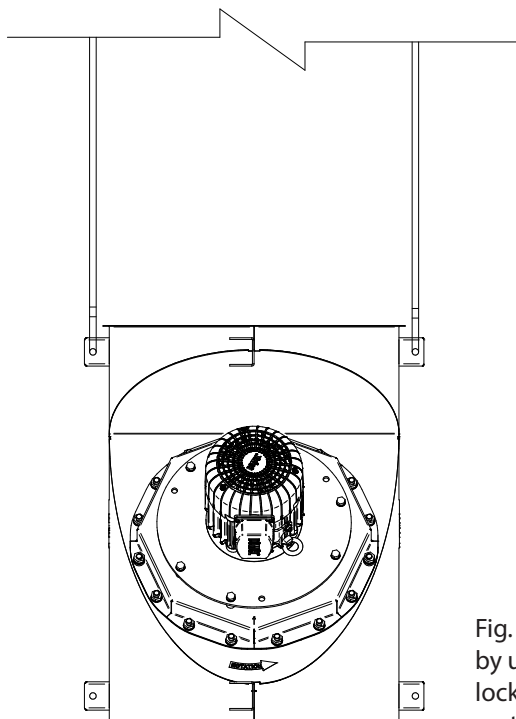


Fig. 7

Fig. 7 illustrates the CFIR mounted vertically by using threaded M10 rods, lock washers and locking hex nuts (A tag weld may be placed on the hex nuts for permanent fixation).

4.7 Horizontal installation

To mount the CFIR 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.

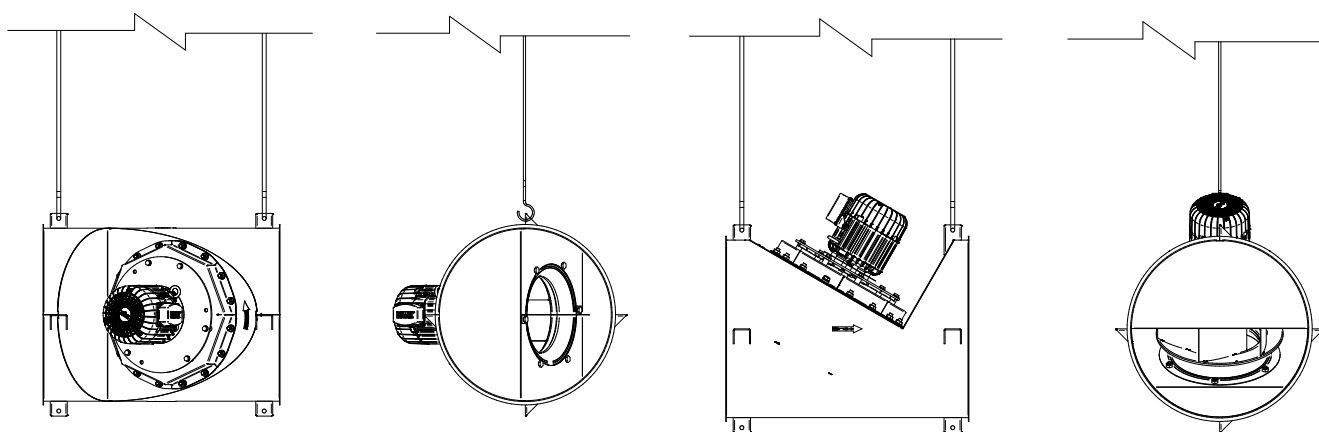


Fig. 8



NOTICE

The CFIR is rated to operate at high temperatures and the risk of severe burns upon direct contact is imminent. Apply appropriate precautions to prevent hazardous situations where needed.



5. Electrical installation

5.1 General



DANGER

Turn off electrical power before performing maintenance. Contact with live electric components can cause shock or death.
Perform lockout/tagout procedure to ensure safety.



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.

Max. revolutions (RPM) are described in section 2.1. Do not exceed these values!

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.

The CFIR200, CFIR300, CFIR400 and CFIR500 is designed to be regulated through an exodraft frequency inverter and can not be connected directly to mains power.

All wiring must be in compliance with local regulations.

exodraft CFIR models operate at different voltages – please pay attention to the wiring details.

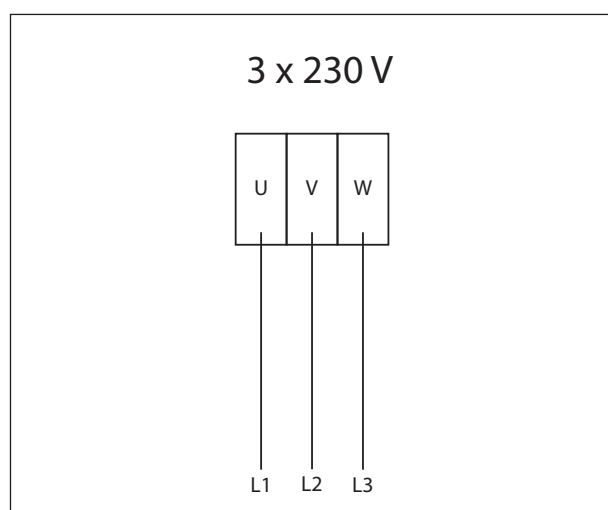
CFIR200 operates at 3 x 208-240 VAC.

CFIR300, CFIR400 and CFIR500 operate at 3 x 380-480 VAC (Optional 3 x 208-240 VAC).

This is indicated by the terminal wire configuration in the motor junction box. See Section 5.2 & 5.3

5.2 Wiring diagram – CFIR200

Inline fan and motor specifications can be found under Section 2.1 Dimensions.



The inline fan is equipped with a variable speed motor. CFIR200 requires 3 x 230 V AC.

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** fan delivery.

5.3 Wiring Diagram – CFIR300, CFIR400 and CFIR500

CFIR300, CFIR400 and CFIR500 require 3 x 400 V AC from the factory. They can be configured for 3 x 230 V AC using the diagram below.

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

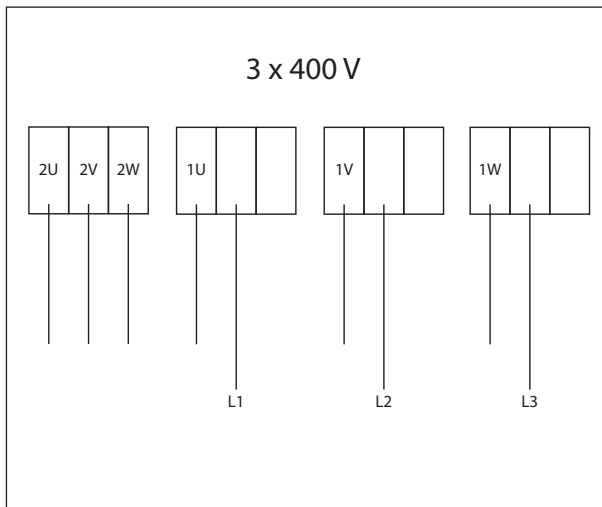


Fig. 10A.

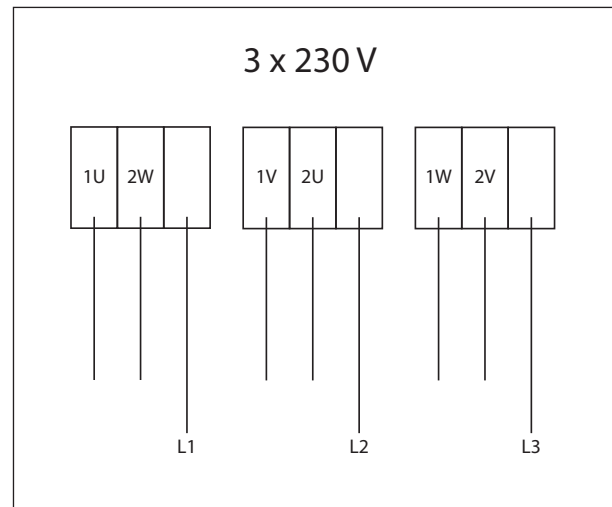


Fig. 10B.

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

5.4 Checking and changing rotation of CFIR200, CFIR300, CFIR400 and CFIR500

To check the rotation of the impeller, the rotation of the cooling vanes at the end of the motor housing must be observed at low RPM.

The cooling vanes can be observed through holes in the end cover of the motor. Correct rotation direction is indicated by an arrow on the housing in front of the motor as illustrated in Fig. 11.

It is possible for the fan to operate with improper rotation, causing the fan to be limited to 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.

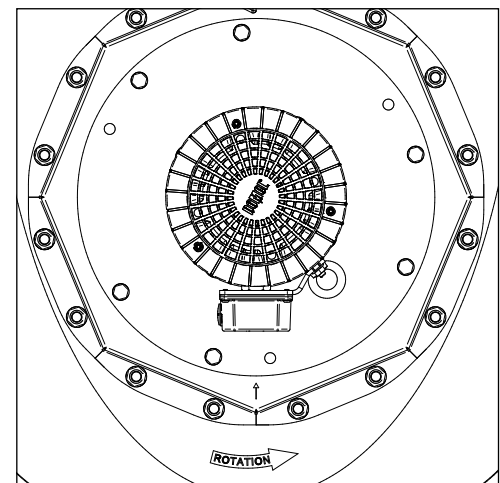


Fig. 11



DANGER

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



6. Startup and configuration

6.1 General

The purpose of this **exodraft** CFIR 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.

6.2 System testing



WARNING

**Do not start the CFIR 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 freely and has not be subjected to misalignment during shipping or installation.
3. Apply power, and check that the impeller is rotating in the direction of the arrow on the side of the motor housing.
All **exodraft** CFIR fans must run in the predefined direction indicated on the housing.
4. Switching any two phases between the fan and the frequency converter will reverse rotation.

6.3 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.

6.4 Testing safety system

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



7. Maintenance and troubleshooting

7.1 General

The **exodraft** CFIR inline fan is designed for prolonged use, and no regular maintenance is required.

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

If the fan needs maintenance or inspection, the motor unit can be removed as illustrated in section 7.2.



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

7.2 Preparing the inline fan for cleaning

Referring to fig. 12 below, follow these steps to open the CFIR inline fan so it can be cleaned and inspected:

1. When disassembling and assembling motor section, lifting instructions must be followed. See section 7.3.
2. Remove the sixteen 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 the hex nuts as specified in Fig. 12.

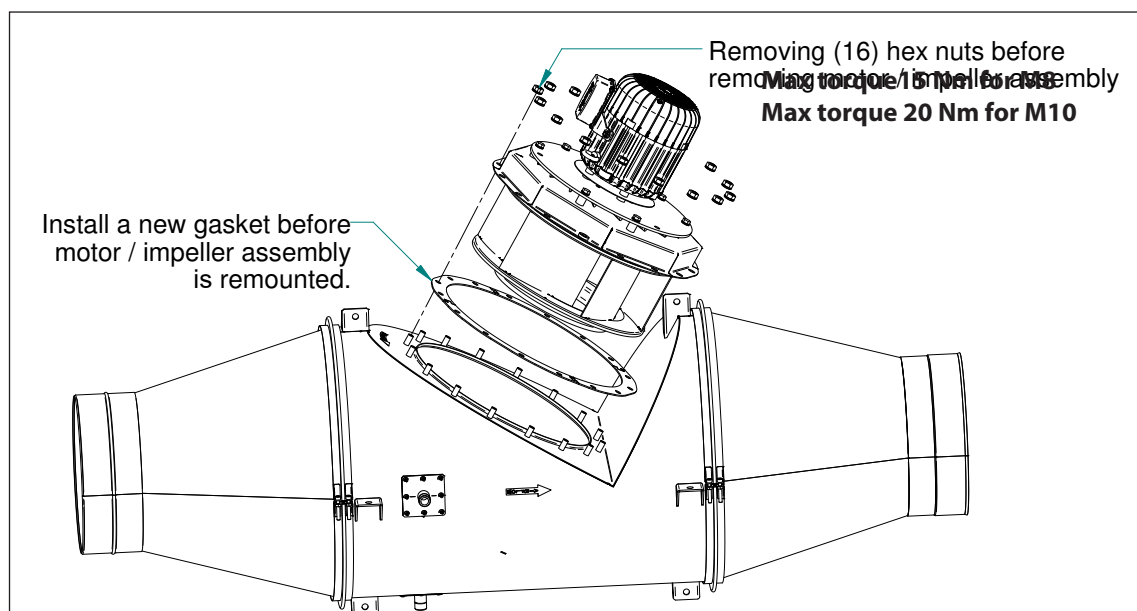


Fig. 12

NOTE:

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

CFIR200: 13 Kg

CFIR300: 21 Kg

CFIR400: 34 Kg

CFIR500: 44 Kg



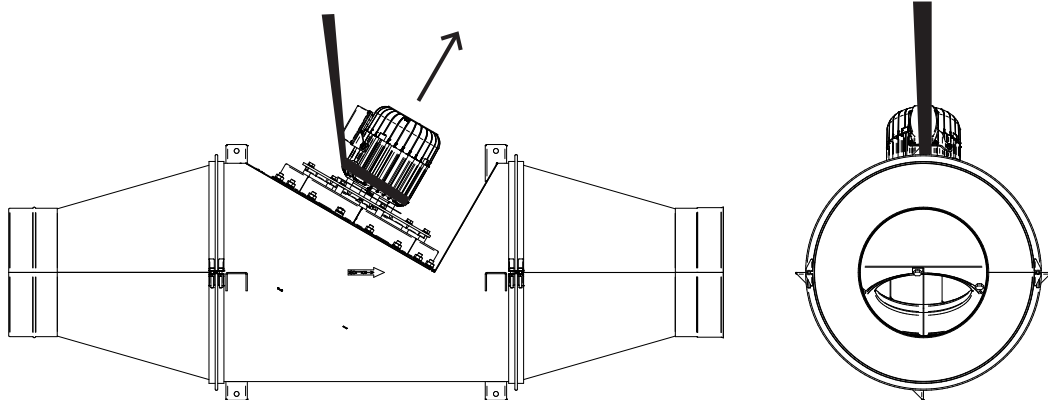
WARNING

Do not open the housing unless the CFIR inline fan has been disconnected from power supply.

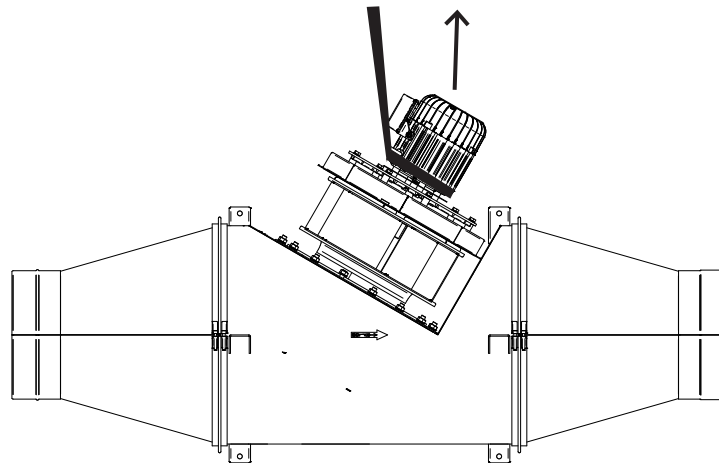
Please refer to section 5.1 for further instructions.

7.3 Disassembly and assembly of motor section

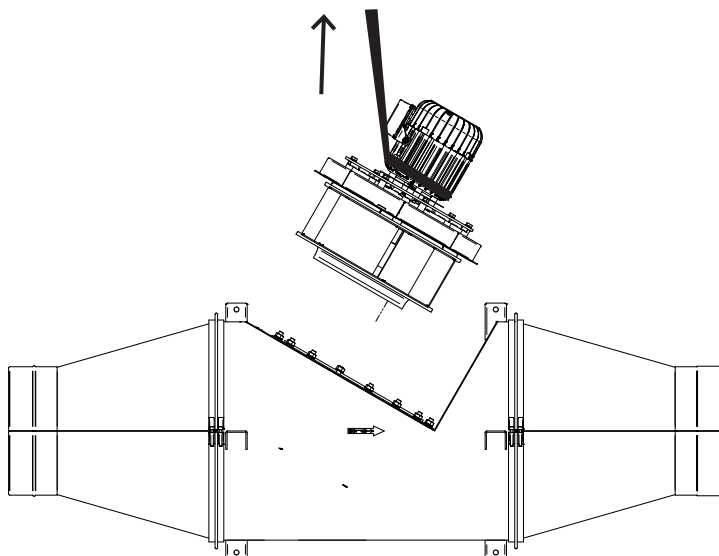
Step 1



Step 2

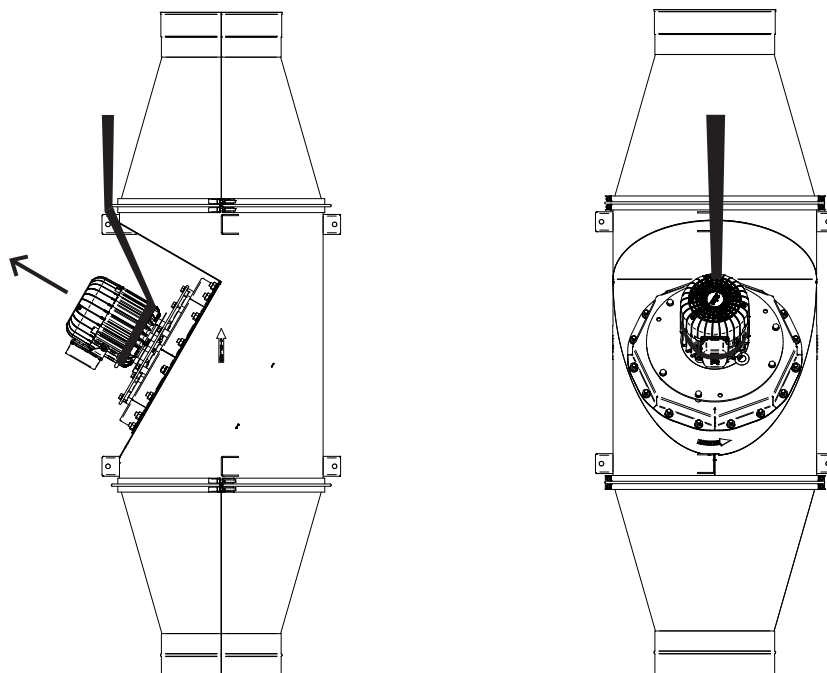
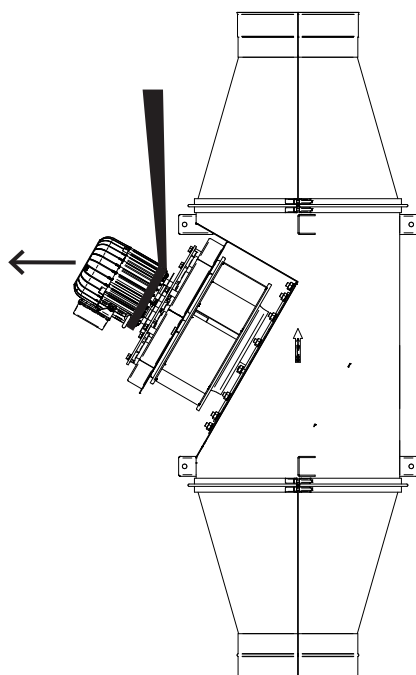
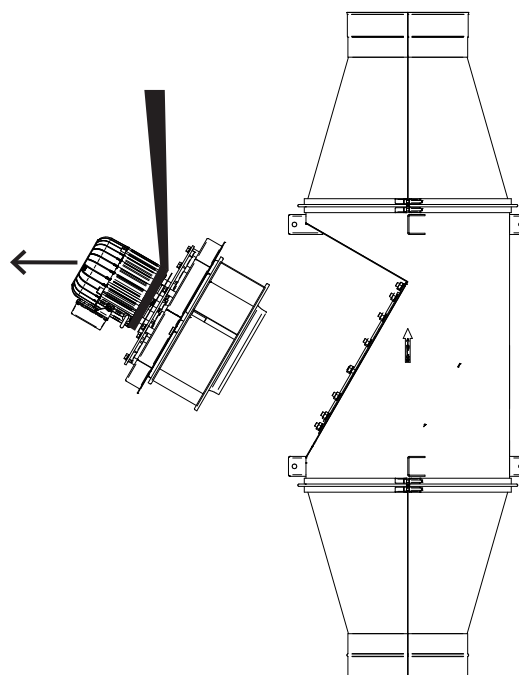


Step 3





Vertical direction
Horizontal direction

Step 1**Step 2****Step 3**

7.4 Troubleshooting

Problem	Possible cause(s)	Solution
The fan is not operating	– No power to the fan	– Check the power supply wires in the junction box by the fan. – Check the circuit breaker. – Check that the fan is actually turned on.
The fan is rotating backwards	– Phase sequence in the power to the fan is reversed	– Swap two phases between the frequency converter and the fan
The fan is vibrating vigorously	– Foreign matter is stuck in the impeller. – A ball bearing is damaged. – A balancing weight has fallen off the impeller	– Turn off the fan and remove the foreign matter. – Turn off the fan. After the motor has stopped revolving, spin the impeller and listen for any grinding noises coming from the motor. If necessary, replace bearing or entire motor. – Re-balance impeller or replace it. Check motor for damages.
The fan stops in the middle of firing cycle	– The motor is over-heating	– Check the flue gas temperature at the fan inlet. The temperature should not exceed 600 °C during continuous operation. Call your supplier for advice.



8. Declaration of Conformity

DK: EU-Overensstemmelseserklæring GB: Declaration of Conformity DE: EU-Konformitätserklärung FR: Déclaration de conformité de l'Union Européenne NO: EU-Samsvarserklæring PL: EU Deklaracja zgodności	NL: EU-Conformiteits verklaring SE: EU-Överensstämmelsedeklaration FI: EU-Vaatimustenmukaisuusvakuutus IS: ESS-Samræmisstaðfesting IT: Dichiarazione di Conformità Unione Europea
exodraft a/s C.F. Tietgens Boulevard 41 DK-5220 Odense SØ	
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 àbyrgð, að eftirfarandi vörur: Dichiaro con la presente che i seguenti prodotti:
CFIR200, CFIR300, CFIR400, CFIR500	
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:
EN60335-1, EN60335-2-80, DS/EN ISO 12100: 2011	
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: Vèlaeftirlitið: Direttiva Macchinari:
2006/42/EF	
Lavspændingsdirektiv: The Low Voltage Directive: Niederspannungsrichtlinie: Directive Basse Tension: Lavspenningsdirektivet: Dyrektywę Niskonapięciową	De laagspanningsrichtlijn: Lågspänningsdirektivet: Pienjännitedirektiivi: Smáspennueftirlitið: Direttiva Basso Voltaggio:
2014/35/EC	
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:
2014/30/EC	
Odense, 29.05.2019 Adm. direktør Managing Director Jørgen Andersen 	Algemeen directeur Geschäftsführender Direktor Président Directeur Général Verkställande direktör Toimitusjohtaja Framkvemdastjóri Direttore Generale

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