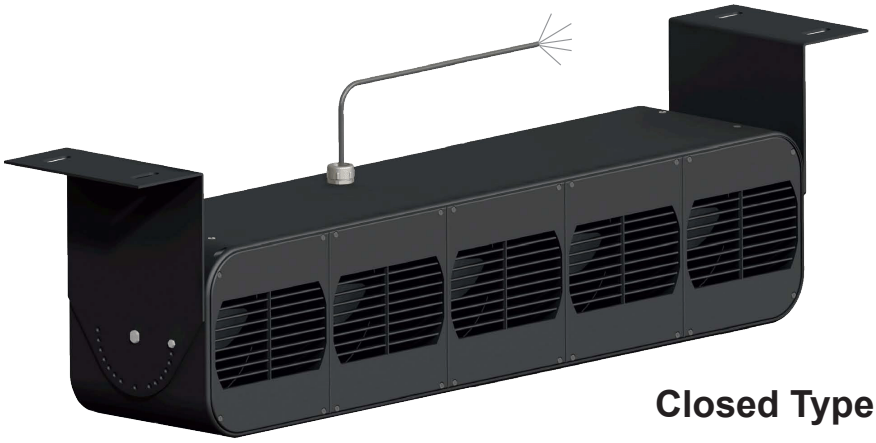
Operation and Maintenance Manual for

Wolter "GREEN" Induction Fans
J / JFI Series



Closed Type

Ceiling Type

Contents

1 General safety notes

1.1 The operator's duty of care

The J fans of the J series have been constructed and built whilst taking into account an analysis of the hazards involved, and after careful selection of the harmonised standards to be observed, as well as other further technical specifications. They thus correspond to the current level of technology and guarantee a high degree of safety. In operational practice, however, this level of safety can only then be attained if all required measures are taken. It is incumbent upon the operator's duty of care to plan these measures and to monitor their execution.

In particular, the operator must ensure that

- the fan is only used as stipulated (cf. chapter, "Product Description")
- the fan is only operated in a faultless and functional condition and that safety fittings, especially, are regularly examined with respect to their functionality
- the operating instructions are always maintained in a readable condition and are available at the fan's location of deployment in their entirety
- only sufficiently qualified and authorised personnel operate, maintain and repair the machine
- these members of personnel are familiar with the operating instructions and especially the safety notes contained therein
- no safety and warning signs fitted to the fan are removed, and that they are kept in a readable condition.
- the fan's surrounding is kept clean to avoid items from being sucked into the fan and/or blocking the air flow

1.2 Explanation of the safety symbols used

The following symbols are used in these operating instructions. These symbols are, above all, intended to draw the reader's attention to the text contained in the adjacent safety note.

	Warning	This symbol indicates that dangers exist which are hazardous to life and health.
	Mortal danger	Electrical hazard. Serious - and also fatal - injury can result if these notes are disregarded.
	Note	Indicates user tips and other useful advice.

1.3 Basic safety measures

Wolter J fans are, at the moment of delivery, manufactured to the current level of technology. Extensive materials, function and quality checks assure them of a high level of usefulness and long service life. Nevertheless, these machines can be dangerous if they are improperly used by untrained personnel or are used in a non-stipulated manner.

 Read these operating instructions carefully before putting the J fans into operation!

Only operate the fan in its enclosed state with properly fitted built-in guide vanes and protective screens.

- Assembly, electrical connection and maintenance may only be carried out by trained craftsmen!
- Only operate the fan in the manner stipulated and within the specified output limits (see rating plate) and with approved conveyed media!

1.4 Particular kinds of hazards

The Inducing fans of J series are axial fans running in parallel. In this respect, particular hazards are caused by the rotor and through the flow of air, which can, at times, be considerable. For this reason the following points are to be observed:

- Never reach into the rotor when it is rotating. Do not try to use your hand as a brake for the rotor during maintenance work.
- Loose clothing or light parts can be sucked in by the draught of air. That is why you should always wear tight-fitting clothing during maintenance work and whilst near the fan inlet.
- Larger items can obstruct or totally ruin the rotor and other parts of the fan. For this reason, the protective screens and built-in guide vanes on the fan inlet and outlet must be fitted at all times during operation.

The motor fan-assembly must not be put into operation while it is removed from the housing.

2 Product description

2.1 Stipulated usage

Our J fans have been specially developed for use in modern underground car parks, garages, warehouses and workshops aiming to improve airflow and overall comfort such as passage way ventilation systems. The rotors are statically and dynamically balanced at the factory, and manufacture is subject to the strictest intermediate and end checks and is certified in accordance with DIN/EN/ISO 9001.

Conditions of use

The air should correspond to tender specifications, as the corresponding components are determined for this. If these are not listed in more detail, then the following applies:

The J fans of the J series are suitable for the conveyance of

- clean air
- air containing car exhaust emissions
- air which has little dust and grease content
- gases and vapours which are non-explosive and only slightly aggressive in nature
- media up to a maximum air density of 1.3 kg/m^3
- flow volumes at temperatures ranging from -30ºC to +40ºC
- media up to a max. humidity of 95%

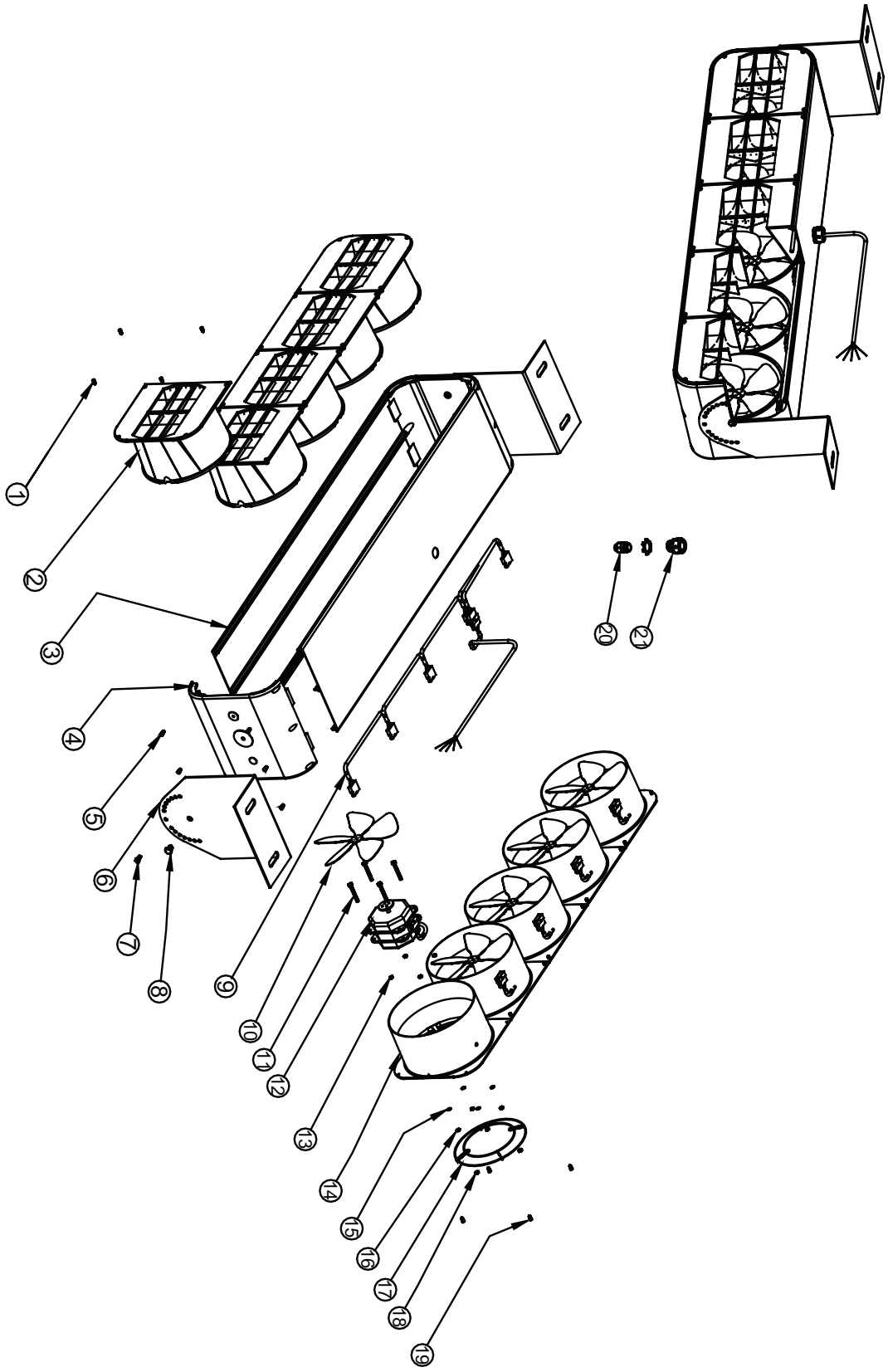
Conditions of fitting

The fans are not designated for any types of usage other than those cited here. Please contact the manufacturer for more information in intend for other application or otherwise shall be considered as improper usage!

In particular, we especially draw your attention to the following points. Non-compliance can either result in considerable material damage or personal injury, or that the demanded fan output values are not attained.

The fan may not be operated without the necessary safety fittings. For this reason, protective screens on the fan inlet must be fitted at all times during operation in order to prevent access to rotating parts.
In order to avoid any damage to the fan and specially to the rotor blades, you must prevent the possibility of loose parts being sucked in by the fan or of other items being able to find their way into the fan.
The fitting notes regarding inlet and outlet flow conditions are to be observed (see 5.1.1).

2.2 Construction



Part Nos.	Description	Qty
21	Steel Lug	1
20	Plastic Lug	1
19	Bolts	20
18	Nuts	10
17	Wire guard	5
16	Nuts	20
15	Washer	20

Part Nos.	Description	Qty
14	Inlet Tube	5
13	Motor Nuts	20
12	Motor	5
11	Motor Bolts	20
10	Impeller	5
9	Elactrical Wire	1
8	M8 Bolts	2

Part Nos.	Description	Qty
7	M5 Bolts	2
6	Bracket	2
5	Bolts	12
4	Side plate	2
3	Top and Bottom plate	1
2	Outlet Tube	5
1	Bolts	20

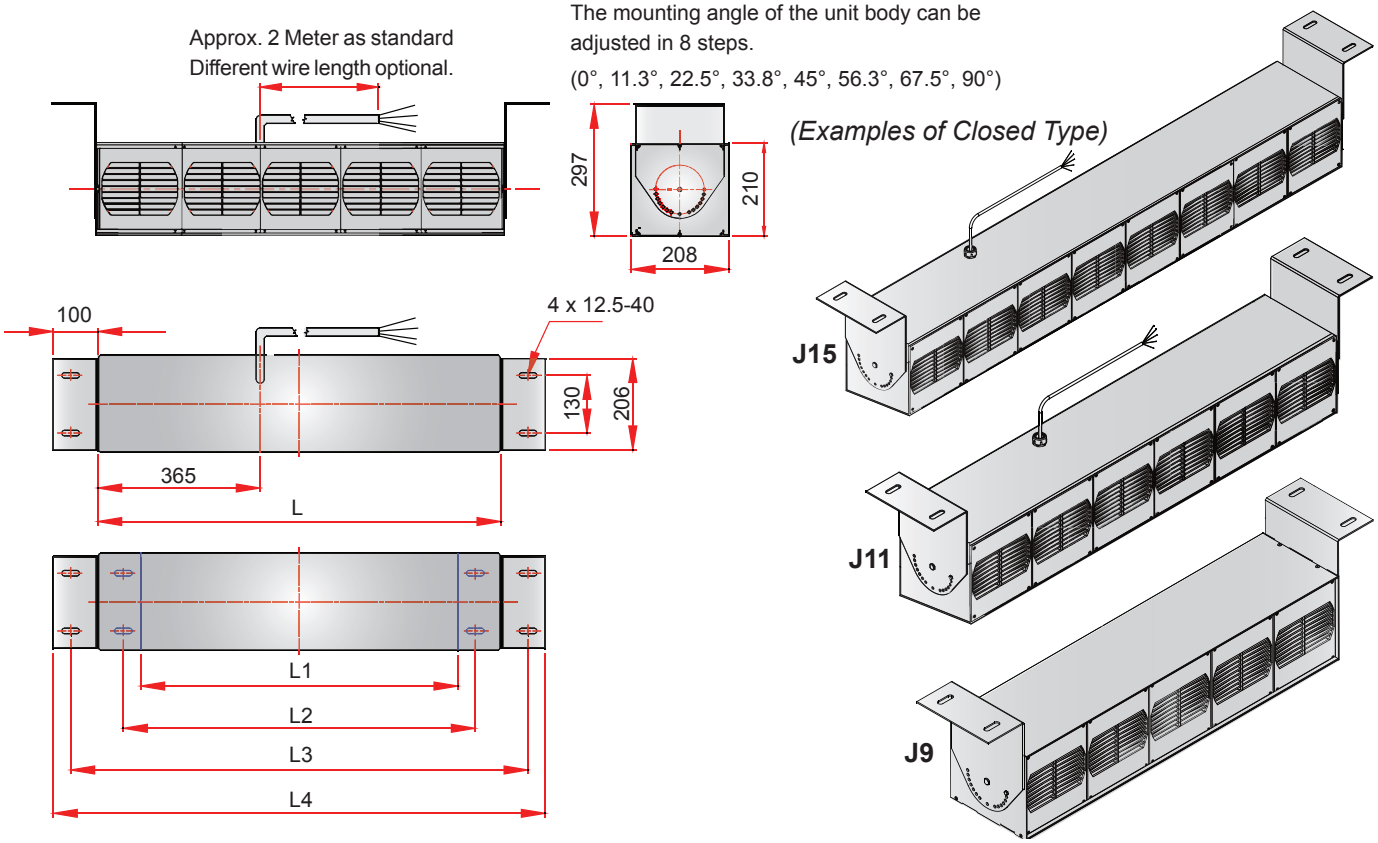
2.3 Functional description

The J fan can be designed for installation on the ceiling, wall, floor, supporting beam and etc with free-suction and free-blowing operating condition. It draws air from the surrounding on the suction side through the rotating impeller and conveys this air in axial direction to the outlet side. This high-velocity airstream induces a secondary airflow downstream of the fan outlet and is used to mix and convey the air within a large contained compartment. In normal applications, the inducing fan is part of a complete ventilation system including other fans, sensors, control equipment, and main exhaust and/or supply fans.

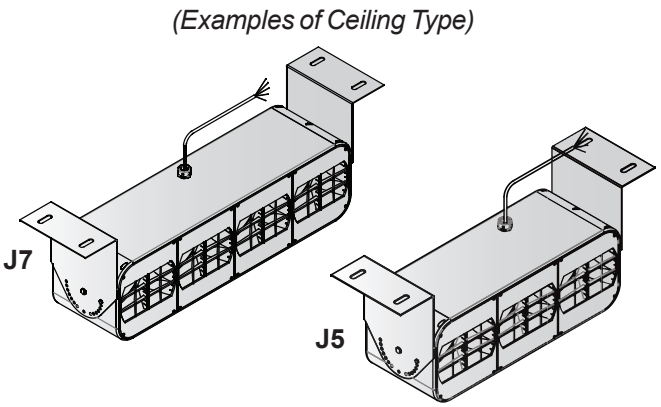
The motor is positioned in the air flow and is cooled by the flow.

Control and regulation of the Inducing fan is carried out by an external control unit. This does not form part of the Inducing fan itself. The corresponding operating instructions are to be consulted with regard to the control unit's operation.

2.4 Dimensions



Model -	L [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]
J5 / JFI 500	548	354	432	670	748
J7 / JFI 700	730	535	613	851	930
J9 / JFI 900	910	718	798	1037	1117
J11 / JFI 1100	1090	899	979	1218	1298
J15 / JFI 1500	1452	1260	1340	1580	1660



* We reserve the right to alter measurements without notice in case of technical improvements.

3 EC Declaration of Conformity

Declaration of Incorporation
According to the Machinery Directive / CE declaration as defined by the Machinery Directive 89/392/EEC annex IIB

Type of machinery

Induction Fan: J / JFI

Motor type
Asynchronous external or internal rotor motor or D.C. or electronic committed external rotor motor.
The products are developed, designed and manufactured in accordance with the EC Machinery Directive 89/392/EEC in the responsibility of

Wolter Asia Ltd.	**Dongguan Wolter Chemco Ventilation Ltd.**
Unit A4, 3rd floor, Merit Industrial Centre, No.94 To Kwa Wan Road, Kowloon, Hong Kong	No.32 of Wang Zhongming Road, Miao Bianwang Industrial Zone, Shipai Town, Dongguan, Guangdong, PRC China

The following harmonized and fan performance standards are used:
EN 60204-1: Safety of machinery; electrical equipment of machines, Part 1: General requirements
EN 292: Safety of machinery; basic concepts, general principles for design
EN 294: Safety of machinery , Safety distances for the prevention of injures within danger zones
IEC 60335-2-80: Household and similar electrical appliances - Safety - Part 2-80: Particular requirements for fans
IEC 60335-1:2010 + AMD1:2013 + AMD2:2016 CSV Consolidated version:
Household and similar electrical appliances - Safety - Part 1: General requirements

Note:
The compliance with EN 294 refers to the fitted contact safety device only, as it is part of the extent of delivery. The total compliance with EN 294 is the system manufacturer's or the contractor's responsibility.

EN 60034-1 / IEC 34-1
Rotating electrical machines: Part 1: Rating and performance

EN 60034-5
Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification

EN 60085-5
Electrical Insulation. Thermal evaluation and designation

AMCA 300: Reverberant Room Method for Sound Testing of Fans
The ascertaining of the sound power level follows the reverberant room measurement method according to AMCA 300

AMCA 210: Laboratory Methods of Testing Fans for Certified Aerodynamic Performance rating
The performance curves provided in this catalogue were measured according to AMCA 210 in a test chamber.

If the machine is a single component of a complete equipment/machinery, the conformity of this equipment/machinery with the EC Machinery Directives has to be ensured before the initial operation.

Date: 25.02.2016

Nicholas Ang
Vice President

4 Transportation and Storage

4.1 Transportation

Wolter J fans are packed at the factory to suit the respectively agreed mode of transportation.
Transport the fan in its original packaging.

- Only use suitable means of transport, such as pallet trucks or fork-lift trucks.
- If the fan is to be transported by hand, ensure that supporting and carrying loads are kept within reasonable limits for the personnel involved.

The following special hazards must be taken into account when transporting the equipment:

- The transportation packaging does not prevent damage to the equipment through improper transportation.
- The fans must not be dropped or thrown.
- Sharp, protruding edges can lead to injury through cuts.

- Suspended loads can fall, which then constitutes a fatal hazard - stand well clear of suspended loads!

- Parts which have been stacked too high can collapse.
- If load-carrying devices other than those specified here are used, then this can lead to serious damage to the machine.
- A risk of fire exists due to the easily flammable nature of the packaging materials
- Do not use naked flames and do not smoke!
- Read the chapter, "General Safety Notes".

4.2 Storage

- Store the fan in a dry, weather-protected location in its original packaging or protect it from the effects of dirt and the weather until final assembly. Cover open pallets with tarpaulin sheets and protect the fans from the effects of dirt and contaminants (e.g. swart, stones, wire etc.)
- Avoid extremes of cold and heat.
- Avoid lengthy storage periods (a maximum of two years is recommended).

5 Assembly

Assembly and electrical work is only to be carried out by trained and instructed craftsmen and in accordance with the respectively applicable regulations!

The following points are to be observed when assembling the fan:
Use only the fan's ceiling mounting brackets (see 2.2) to install the fan to the ceiling.
Use adequate mounting hardware suitable for the fan's weight.
The ceiling must be suitable to bear the weight of the fan.
The J fan can be mounted at few angle and be adjusted in 8 steps.
(0°,11.3°,22.5°,33.8°,45°,56.3°,67.5°,90°)

When lifting the fan into its position on the ceiling during installation, secure it from falling down until it is securely installed.

Attention: Make the electrical connection in accordance with the technical connection conditions and the relevant regulations!

The motor is equipped with thermal contacts, they must be properly checked if trip-off frequently. Failure to do so will void the warranty.

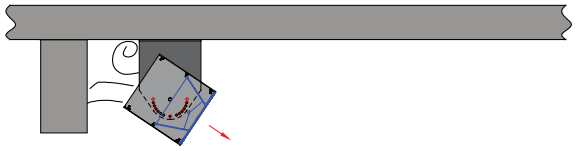
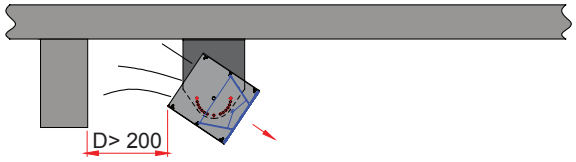
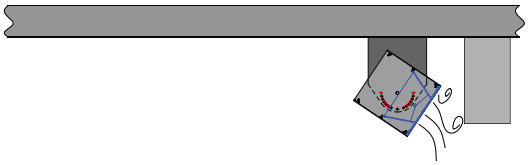
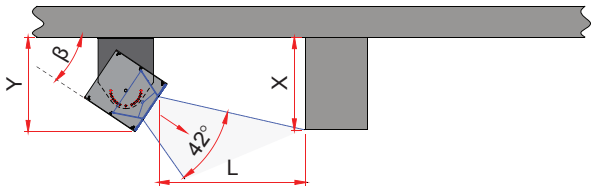
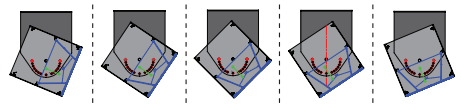
Before checking the direction of rotation:

Remove foreign bodies from the fan area.

Protective screen (see 2.2) must be fitted.

Check the direction of travel in accordance with the arrow on the housing by switching on and off very quickly.

5.1 Inlet and outlet flow conditions

Incorrect	Correct
	
Incorrect: The inducing fan's duty will be reduced if an obstacle (e.g. ceiling beam, pipe, sign etc.) is situated too close to the inlet. A stall condition might occur that can damage the fan and creates additional noise.	Recommended: The distance to obstacles on the inletside has to be chosen according to the size of the obstacle, but must be at least D distance.
	
Incorrect: The inducing fan's duty will be reduced if an obstacle (e.g. ceiling beam, pipe, sign etc.) is situated too close to the outlet. A stall condition might occur that can damage the fan and creates additional noise.	

	Angles	β = 22.5°	β = 33.8°	β = 45°	β = 56.3°	β = 67.5°
	Fan Ht [mm]	Y = 331	Y = 340	Y = 343	Y = 341	Y = 333
		Distance L [mm]				
Height of beam X [mm]	200	370	-	-	-	-
	250	2300	160	-	-	-
	300	4200	380	150	-	-
	350	-	600	260	130	-
	400	-	820	370	200	120
	450	-	1040	480	270	170
	500	-	1260	600	340	220
	550	-	1480	710	420	260
	600	-	1700	820	480	310

Recommended: The distance to obstacles on the outlet side has to be chosen according to the size of the obstacle, but must be at least L distance at respective (β) angles.

6 Initial Start-up

The following points are to be observed in order to avoid damage to the machinery or life-threatening injury during initial start -up:

Only qualified personnel may carry out the machine's initial start-up and this must take place in compliance with the safety notes.

Prior to initial start -up, check that all tools and foreign bodies have been removed from the machine.

Activate all safety devices and Emergency Stop switches prior to initial start -up.

Check the motor's direction of travel prior to initial start-up.

Read the chapter, "General Safety Notes ".

6.1 Checks prior to initial start-up

Proceed with the fan's initial start-up in the following sequence:

Check that the mechanical assembly has been carried out properly

Remove foreign bodies located in the suction and outflow areas and in the fan space

Check that the electrical installation has been completed in accordance with regulations

Does the mains voltage match the motor voltage specified on the rating plate?

Is the switchgear used suitable for the motor both with respect to the switching functions to be carried out and also to the switching conditions and switched output of the motor?

Is the motor protection system set correctly with regard to the motor's nominal current? The setting must be carried out in accordance with the corresponding details contained on the motor output plate.

Has the motor been connected correctly in accordance with the wiring diagram?

The connection schematic supplied must be exactly applies for the connection of the motor.

Accident prevention

Inlet protective screen must be fitted on the inlet of the fan to meet safety regulations.

6.2 Starting up the fan for the first time

Only put the fan into operation after it has been assembled in accordance with the regulations!

Put the fan into operation.

Monitor its correct function (quiet running, vibration, imbalance, power consumption, controllability)

Always keep suction openings clear! Check protective screens or protective anti-intrusion fittings for dirt, and clean if necessary!

6.3 Checks after initial start-up

Check the mechanical connections of the fan to the ceiling after initial start -up.

7 Help with Malfunctions

The following points must be observed in order to avoid damage to the machinery or life-threatening injury when eliminating machine malfunctions:

- Only eliminate any malfunction if you have the specified qualifications necessary for the task.
- First of all ensure that the machine cannot be switched on inadvertently, by locking the equipment's off switch or control cabinet by means of a padlock.
- Secure the hazardous area with respect to moving machine parts.
- Read the chapter "General Safety Notes".

Tabular overview of possible malfunctions and aids in eliminating those malfunctions

Symptom	Cause	Elimination
Motor or motor control system switches off.	Motor too hot, thermo contact activates.	Allow the motor to cool off. The fan will start itself again. Check whether: - The conveyed medium is too hot - All phases are evenly loaded and connected - Operating point does not match the lay-out - Rotor blocked
Air output incorrect	Incorrect direction of travel of the fan (J)	Change the direction of travel (see electrical assembly)
	Fan assembled incorrectly	Either the rotor is incorrectly mounted on the motor shaft or the whole motor-fan-assembly has been incorrectly fitted into the installation. Switch off the fan. Correct the incorrect assembly (rotor or motor-fan-assembly).
	Rotor blocked	Switch off the fan. Remove the blockage. Ensure that the accident prevention regulations are observed in the process.
	Rotor defective	Switch off the fan. Dismantle the rotor and fit a new one.
Fan is labouring under load, air flow is periodically interrupted	Fan is operating at an unfavorable duty point	Make sure there are no obstacles too close to the J fan's inlet and outlet (see 5.1). Please contact the Wolter for assistance. If this laboured operation of the fan continues over a prolonged period, the rotor will damage! Check if periodic maintenance and cleaning of guard was undertaken. Check against MC001.

8 Maintenance

The following safety notes must be observed when maintaining the machine - life-threatening injuries to personnel, damage to the machine and other material damage, as well as environmental damage, will be avoided in this way.

- Cleaning, lubrication and maintenance work may only be carried out by authorised operating personnel operating instructions are to be observed.
- Repair work may only be carried out by authorised craftsmen - accident prevention regulations are to be observed.
- Secure the operational area over a large area prior to the commencement of maintenance work.
- The specified sequence of the working stages is to be observed exactly.
- All work on the machine's electrical equipment may only be carried out by trained electricians.
- Self-locking screws and nuts are always to be renewed.
- All specified screw torque settings are to be observed precisely.
- Read the chapter "General Safety Notes".

If the J fan is equipped with a combined terminal box / repair switch, it is still necessary to disconnect the mains supply to the terminal box when performing electrical maintenance or repairs that require opening the terminal box!

Setting the repair switch to the "OFF" position cuts off the power supply from the terminal box to the motor, but the connection terminals inside the terminal box are still energized! When unscrewing the terminal box cover, there is a danger of contact between the cover and the connection terminals, therefore the mains supply MUST be disconnected to avoid the danger of electrical shock!

8.1 Servicing

The rotor and housing are subject to natural wear and tear through the action of dust, acidic and corrosive vapours, as well as the gases which are mixed into the conveyed flow. The type and concentration of the dust, as well as the gases and vapours, can lead to deposits, abrasion and corrosion at the rotor and housing.

The materials can be attacked by this natural wear and tear to the extent that they can no longer stand up to the strains imposed on them. Unevenly distributed deposits on the rotor lead to an imbalanced state and thus to noisy running, which in turn can result in damage to the impeller and motor bearing. Deposits in the housing lead to a narrowing of the available cross-sectional area or to a roughening of the housing panels and can thus have an unfavorable effect on the fan's output duty. Should the checks, the regularity of which depend on the conveyed media and other operating conditions which differ in each individual case, reveal only slight wear and tear, then the individual parts must be cleaned in good time, or replaced if necessary.

Prior to all servicing work:

- Bring the fan to a halt in the prescribed manner and completely isolate the fan from the mains supply!
- Wait until the rotor has come to a halt!
- Ensure that the machine cannot be switched on again!
- Clean the fan components (fan housing, casted inlet cone with rotor unit, impeller and casted outlet cone with built-in guide vane). Do not use high-pressure water devices for cleaning

Only use cleaning agents generally available through the trade and in compliance with the prescribed safety measures. Do not use scratching or scraping tools (protective surface coating will be damaged).

- If required, remove the casted inlet cone with rotor unit or outlet cone with built-in guide vane from the fan housing.
- Do not overload the motor!
- Do not bend the impeller blades!

Recommended periodic inspection intervals J

- J fans used for normal ventilation only: 6 months
- J fans used for CO-ventilation and adverse site condition: 3 months

Periodic Inspection checks

- Visual inspection of motor, impeller, fan housing and electric connection for damages, dirt and dust deposits, foreign matter
- Check for unusual noises or vibration during operation
- Check tightness and security of fan suspension as per Maintenance Schedule MC001 recommendation and to avoid void on warranty

8.2 Overhaul

Prior to all overhaul work:

- Bring the fan to a halt in the prescribed manner and completely isolate the fan from the mains supply!
- Wait for the rotor to come to a halt!
- Ensure that the machine cannot be switched on again!

Only use spare parts which have been tested and approved by Wolter!

8.2.1 Removal and installation the casted Inlet cone rotor module

Removal:

- Disconnect mains supply to terminal box and set repair switch to "Off" position, if equipped.
- Open terminal box cover and disconnect motor leads on connection terminals.
- Remove the 4 screws, to facilitate un-installation of the inlet module the fan housing as shown in Figure 1.

Figure 1

- Pull out the inlet module carefully to prevent causing any damage to the motor connection cable. Secure the inlet module from dropping when pulling it out of the housing. Unplug the cable as indicated in Figure 2 to 4.

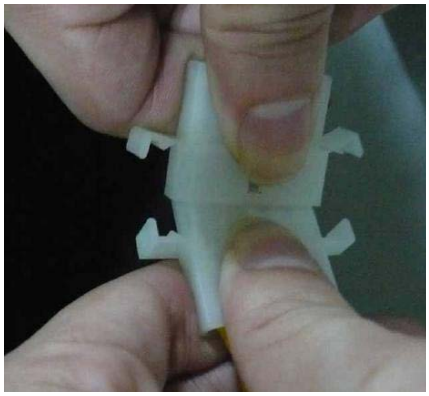


Figure 2, Bend inward

Figure 3, Bend outward

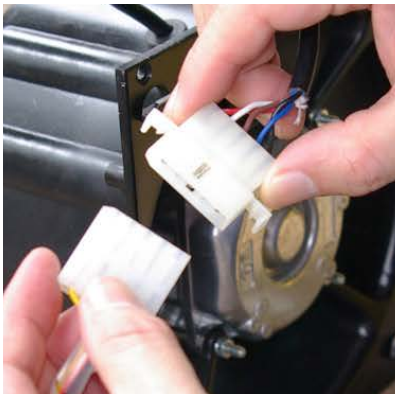


Figure 4, pull to unplug

Installation:

- Re-connect the motor with plug as per Firgure 5.
- Plug the cable as indicated in Figure 6.

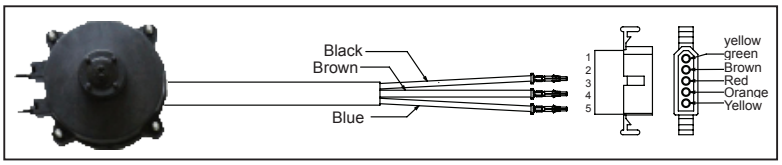
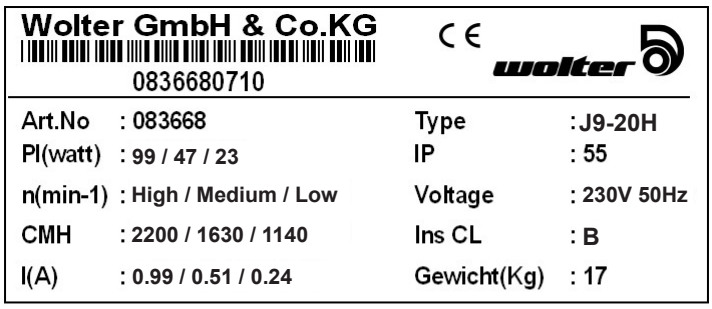


Figure 5, re-connect the wire with plug

Figure 6, Plug in

- Reverse above procedure. Ensure that the inlet module unit is inserted into the fan housing with the correct orientation. After complete re-assembly of the J fan, check that the direction of the airflow is correct.

Note: Motor of IP and Class specification are indicated on the rating plate as shown in Figure 7.
Examples of J9-20H unit



Wolter GmbH & Co.KG			
0836680710			
Art.No	: 083668	Type	: J9-20H
Pl(watt)	: 99 / 47 / 23	IP	: 55
n(min-1)	: High / Medium / Low	Voltage	: 230V 50Hz
CMH	: 2200 / 1630 / 1140	Ins CL	: B
I(A)	: 0.99 / 0.51 / 0.24	Gewicht(Kg)	: 17

Figure 7

8.2.2 Dismantling casted Outlet tube module

Removal

- Disconnect mains supply to terminal box and set repair switch to "Off" position, if equipped.
- Open terminal box cover and disconnect motor leads on connection terminals.
- Removed the 4 screws, so that they can be removed from the fan housing as shown in Figure 8.
- Carefully pull the outlet tube module, taking care not to damage the built-in vane. Secure the outlet module from falling down when pulling it out of the housing as Figure 9.

Figure 8

Figure 9

Figure 10

8.2.3 Dismantling Wire Guard

Removal

- Disconnect mains supply to terminal box and set repair.
- Switch to "Off" position, if equipped. Open terminal box cover and disconnect motor leads on connection terminals.
- Removed the 2 screws, so that they can be removed from the fan housing (back side) as shown in Figure 11.
- Carefully take off the inlet guard.

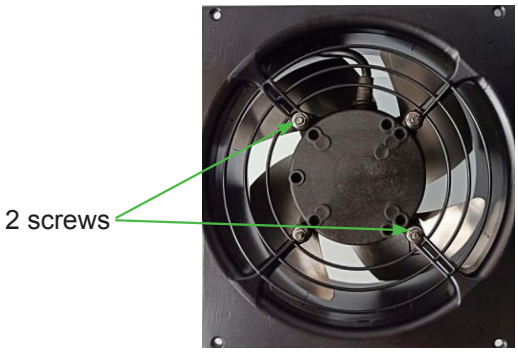


Figure 11

Recommended periodic inspection on both the cast outlet tube and wire guard.

- Wire guard and Ceiling Type Outlet tube: at least 3 months and depend on site condition.
- Wire guard and Closed Type Outlet tube: at least 1 to 2 months and depend on site condition.

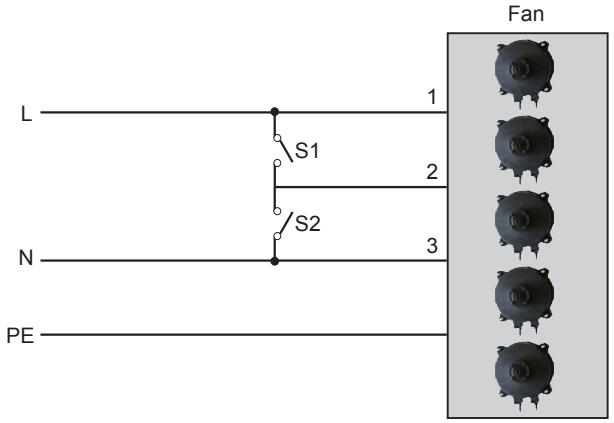
Note : Maintenance on all guards must be carried out periodically against MC001 to avoid void on warranty.

9 Wiring diagram

9.1 Step switch connection

J Series (EC)

1 = Brown
2 = Orange
3 = Red
4 = Yellow
PE = Yellow-Green



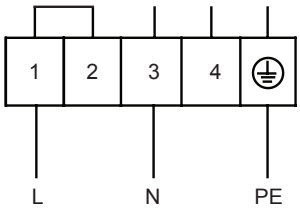
S1	S2	Speed
OFF	OFF	Low speed
OFF	ON	Medium speed
ON	OFF	High speed

9.2 Single speed connection

J Series (EC)

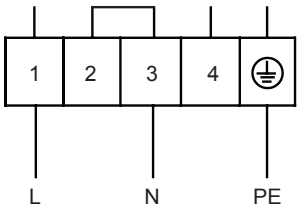
High Speed

1 = Brown
2 = Orange
3 = Red
4 = Yellow
PE = Yellow-Green



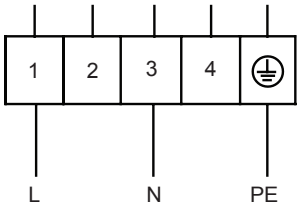
Medium Speed

1 = Brown
2 = Orange
3 = Red
4 = Yellow
PE = Yellow-Green



Low Speed

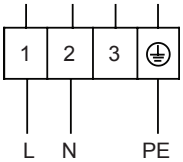
1 = Brown
2 = Orange
3 = Red
4 = Yellow
PE = Yellow-Green



J-E Series (AC)

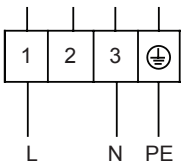
High Speed

1 = Orange
2 = Brown
3 = Red
PE = Yellow-Green



Low Speed

1 = Orange
2 = Brown
3 = Red
PE = Yellow-Green



10 Maintenance Schedule MC001

Project Name:	FAN TYPE		Maintenance No.:	
Fan Model: J / JFI Series	**Ceiling Type**	**Closed Type**	**Examiner**	**Date**
Size : 5 / 7 / 9 / 11 / 15				
JOB STEPS				
First inspection				
- Inspection of transport damages	X	X		
- Inspection of fan housing	X	X		
- Inspection of impeller	X	X		
- Inspection of wire guard	X	X		
- Inspection of outlet tube	X	X		
- Inspection of cable gland and Wire connection				
Inspection after mounting				
- All damages to paint rectified	X	X		
Inspection after commissioning				
- Direction of rotation checked	X	X		
- Abnormal Vibration during operation	X	X		
- Abnormal Sound pressure level	X	X		
- Electrical values measured Voltage / Frequency / Current.....V / .....Hz / .....A	X	X		
WORKING STEP				
Maintenance (at least every 6 months and depend on site condition)				
- Bearing status checked / re-greased	X	X		
- Visual fan housing check	X	X		
- Visual impeller check	X	X		
- Visual check for corrosion	X	X		
- Visual motor check	X	X		
- Sound pressure level check	X	X		
- Check all screw connections of suspension construction	X	X		
- Electrical values measured: Voltage / Frequency / Current.....V / .....Hz / .....A	X	X		
- Maintenance (at least every 3 months depend on site condition)	X			
- Ceiling Type Outlet Tube	X			
- Maintenance (at least every 1 to 2 months depend on site conditon)		X		
- Wire Guard	X	X		
- Closed Type Outlet Tube		X		

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