

Directions for use

IRB



ENGLISH

This directions for use contains following products:
IRB circular and rectangular.
Scan the QR code on the product label
or visit www.ostberg.com
for further information about the product.



DESCRIPTION

IRB is an insulated in-line duct fan with backward curved impeller and swing-out design. It is available with circular or rectangular connections.

The fan is equipped with ErP approved external rotor induction AC or EC motor with maintenance-free sealed ball-bearings. The fans are manufactured from galvanized steel sheet.

APPLICATION

- IRB is accessible for the user, according to IEC 60335-2-40, to by themselves do the service and maintenance, according to this Directions for use. But before this work the unit must be currentless. With reservation according to IEC 60335-2-7.12 "This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety." "Children should be supervised to ensure that they do not play with the appliance."
- The fan is used for transportation of "clean" air, meaning not intended for fire-dangerous substances, explosives, grinding dust, soot, etc.
- To achieve maximum life time for installations in damp or cold environments, the fan should be operating continuously.
- The fan can be installed outside or in damp environments. Make sure that the fan house is equipped with drainage.
- The fan is intended to be used at the highest voltage and frequency that's stated on the label on the fan.
- The fan can be installed in any position.

HOW TO HANDLE

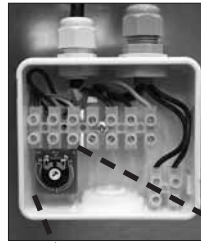
- The fan must be transported in its packing until installation. This prevents transport damages, scratches and the fan from getting dirty.
- Attention, look out for sharp edges and corners.
- Avoid extreme heat or cold (temperature range for storage and transport).

INSTALLATION

- The fan must be installed according to the air direction label on the fan.
- The fan must be connected to duct or equipped with a safety grille.
- The fan should be installed in a safe way and make sure that no foreign objects are left behind.
- The fan should be installed in a way that makes service and maintenance easy. N.B.! Consider the weight and size of the fan.
- The fan should be installed in a way that vibrations not can be transfused to duct or building. To provide this, use for example a flange.
- Electrical installations must be made by an authorized electrician.
- See Wiring diagram at the lid of the junction box.
- Electrical installation must be connected to a locally situated isolator switch or by a lockable main switch.
- Control that the fan is installed and connected electrically in the right way, grounded and with motor protection.
- For single phase fans a residual current device i used (type A).
- For 3-phase fans a residual current circuit breaker is used (type B).

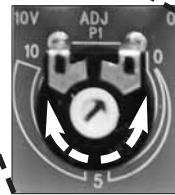
AC-MOTOR

- For speed regulation of AC motor a transformer or thyristor can be connected.
- The AC motor has a built-in thermal contact.
- The capacitor (only for AC motor) has finite lifetime and should be exchanged after 45.000 operation hours (about 5 years of operation) to secure maximum function. Defective capacitor can cause damage.



EC-MOTOR

- Speed regulating of EC motor can be done with the built-in potentiometer, 0-10 V. An external potentiometer can be connected to the terminal if necessary. The internal potentiometer should then be disconnected.



- IRB EC (does not apply for 125 B1/160B1/200 C1/250 A1/250 B1/400x200 C1/500x250 A1/500x250 B1) has a potential free alarm relay that breaks at max AC 250 V 2A, "K1". Fans equipped with a tachometer, see page 15 Technical Data, for number of pulses per revolution.
- Some EC motors has tachometer output one pulse per revolution.
- EMC-compatible installation of external control lines: The control cable must not be longer than 30 m. Screened control cables must be used when the cable length is longer than 20 m. When using a shielded cable connect the shielding to one side only, i.e. only to the device with the protective ground (keep cable short and with as little inductance as possible!). Pay attention to sufficient distance from power lines and motor wires to prevent interferences. **Attention!** Ensure correct polarity! Never apply line voltage to analog inputs!
- The EC motor has electronically thermal-/over-voltage protection.

MODBUS. For Modbus, the fan types IRB 250 E1 EC, IRB 500x 250 E1 EC, IRB 315 A1 EC and IRB 600x300 A1 EC applies:

- Baud rate: 19200
- Bits: 8
- Parity: None
- Stop bits: 1
- Handshake: None

OPERATION

For technical data please see the product label.

Before starting, make sure that:

- the current does not exceed more than +5% of what is stated on the label.

- the connecting voltage is in between +6% to -10% of the rated voltage.
- no noise appears when starting the fan.

MAINTENANCE

- Before service, maintenance or repair begins, the fan must be tension free and the impeller must have stopped.
- Attention, look out for sharp edges and corners.
- Consider the weight of the fan when removing or opening larger fans to avoid jamming and contusions.
- **Attention!** Temperatures up to 85°C can be present on the controller housing (only for EC motor).
- **Waiting period of at least 3 minutes!** (only for EC motor) Because of internal capacitors, danger of death exists even after switching off the device through directly touching the energized parts or due to parts that have become energized due to faults. The controller housing may only be removed or opened when the power line has been switched off and a period of three minutes has elapsed since switching it off.

- When cleaning and maintaining, the fan always have to be secured when open, so it can't fall down and cause injury.
- The fan must be cleaned when needed, at least once a year to maintain the capacity and to avoid unbalance which may cause unnecessary damages on the bearings.
- When cleaning the fan, high-pressure cleaning or strong dissolvent must not be used. Cleaning should be done without dislodging or damaging the impeller.
- The fan bearings are maintenance-free and should be renewed only when necessary.
- Notice the weight of the fan when closing after inspection/cleaning.
- Mount back all details in reverse order. Check that the fan is closed and locked before starting.
- Make sure that there is no noise from the fan.

WARRANTY

The warranty is only valid under condition that the fan is used according to this "Directions for use" and a regular maintenance has been made and record. The warrantor is responsible only for the operation if approved

accessories are used. The warranty does not cover product failures caused by accessories/equipment from other manufacturers.

FAULT DETECTION

1. Make sure that there is power to the fan.
2. Cut the power and verify that the impeller is not blocked.
3. Check the EC motor with LED flashing code. For more information see page 13-14.
4. Check the thermal contact (for AC). If it is disconnected the cause of overheating must be taken care of, not to be repeated. To restore the manual thermal contact, cut the power for a couple of minutes. Larger motors than 1,6 A may have manual resetting on the motor. If it has automatic thermal

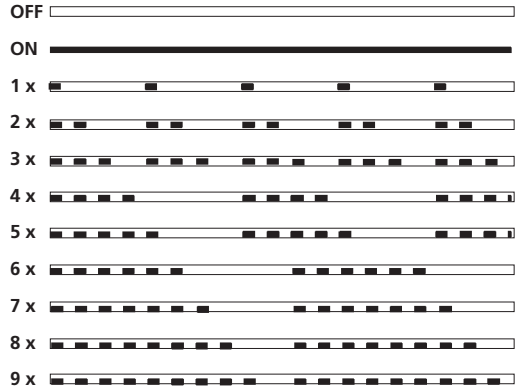
- contact the resetting will be done automatically when the motor has cooled.
5. Make sure that the capacitor is connected according to the wiring diagram (for AC).
6. If the fan still does not work, the first thing to do is to change the capacitor (for AC).
7. If nothing of this works, contact your fan supplier.
8. If the fan is returned to the supplier, it must be cleaned, the motor cable undamaged and a detailed nonconformity report enclosed.

FAULT DETECTION EC motor with LED flashing code

For fan type IRB 250 E1 to IRB 500 F3 EC, IRB 500x250 E1 to 1000x500 F3 EC.

Operating conditions are indicated by the status LED with flashing code.

All others have alarm relay only.



LED Code	Relays K1 (for function factory setting)	Cause Explanation	Reaction of Controller	Adjustment
OFF	De-energized, terminals 11-14 interrupted.	No line voltage.	Line voltage available?	Unit switches OFF and automatically ON when the voltage has been restored.
ON	Energized, terminals 11-14 bridged.	Normal operation without fault.		
1 x	Energized, terminals 11-14 bridged.	No enable = OFF Terminals "D1" - "24 V / 10 V" (Digital In 1) not bridged.		Check terminals "D1" - "24 V/10V"
2 x	Energized, terminals 11-14 bridged.	Active temperature monitoring. The device has an active temperature monitoring to protect it from damage caused by excessively high interior temperatures. In case of a temperature increase above the predetermined threshold value, the level control is linearly reduced. To prevent a shut down during reduced operation by to high temperature of the entire system (in this operating mode, allowable for the controller) no switch off or no alarm indication occurs by the relay.	At sinking temperature the modulation rises again linear.	Check cooling of the controller.

FAULT DETECTION				
LED Code	Relays K1 (for function factory setting)	Cause Explanation	Reaction of Controller	Adjustment
3 x	De-energized, terminals 11-14 interrupted.	HALL-IC Incorrect signal from the Hall-ICs, error in the commutation.	Controller turns the motor off. Automatic restart if no more fault is recongized.	
4 x	De-energized, terminals 11-14 interrupted.	Line failure (only for 3 ~ types) The device is provided with a built-in phase-monitoring function for the mains supply. In the event of a mains interruption (failure of a fuse or mains phase) the unit switches off after a delay (approx. 200 ms). Function only when load for the controller is high enough.	Following a shut off, a start up attempt is made after approximately 15 seconds, if the voltage supply is high enough. This keeps occurring until all 3 supply phases are available again.	Checking power supply.
5 x	De-energized, terminals 11-14 interrupted.	Motor blocked If after 8 seconds commutation no speed is measured > 0, the fault "Motor blocked" is released.	EC-Controller switches off, renewed attempt to start after about 2,5 sec. Final shut off, when fourth starting test fails. It is then necessary to have an enabling reset or to disconnect the power supply.	Check if motor is freely rotatable.
6 x	De-energized, terminals 11-14 interrupted.	IGBT Fault Shortcut earth or shortcut of motor winding.	EC-Controller switches off, renewed attempt to start after about 60 sec. ☞ Code 9. Final shutoff, if - following a second starting test - a second fault detection is detected within a period of 60 seconds.	
7 x	De-energized, terminals 11-14 interrupted.	DC undervoltage If the voltage drops below a specified limit, the device is shut off.	If the intermediate circuit voltage rises again within 75 seconds above the limit, an automatic starting test is run. If the intermediate circuit voltage remains below the limit for more than 75 seconds, the device is shut off with a fault message.	
8 x	De-energized, terminals 11-14 interrupted.	DC overvoltage If the voltage increases below a specified limit, the motor is switched off. Reason for excessively high input voltage or alternator motor operation.	If the intermediate circuit voltage drops again within 75 seconds below the limit, an automatic starting test is run. If the intermediate circuit voltage remains above the limit for more than 75 seconds, the device is shut off with a fault message.	
9 x	Energized, terminals 11-14 bridged.	IGBT cooling down period IGBT cooling down period for approx. 60 sec. Final shut off after 2 cooling-off intervals ☞ Code 6.		

EC DECLARATION OF CONFORMITY

We hereby confirm that our products comply with the requirements in the following EU-directives and harmonised standards.

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Products: Duct fans IRB

Low Voltage Directive (LVD) 2006/95/EG

Harmonised standards:

- EN 60335-1:2002 "Household and similar electrical appliances - Part 1: General requirements"
- EN 60335-2-80:2003 "Household and similar electrical appliances - Part 2-80: Particular requirements for fans"

Directive for Electromagnetic Compatibility (EMC) 2004/108/EG

Harmonised standards:

- SS-EN 61000-6-1:2007 "Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments"
- SS-EN 61000-6-2:2005 "Electromagnetic compatibility (EMC). Generic standards - Immunity for industrial environments"
- SS-EN 61000-6-3:2007 "Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments"
- SS-EN 61000-6-4:2007 "Electromagnetic compatibility (EMC). Generic standards - Emission standard for industrial environments"

Machinery Directive (MD) 2006/42/EG as defined in appendix 2A

Risk analysis is performed.

Installation must be done in accordance with the attached "Directions for use".

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