

Installation manual

CBRF electric duct heater

Self-controlled with airflow rate monitoring



This manual is intended for the installer of the electric duct heater type CBRF. The manual contains important information on the operation and installation of the duct heater.

Electric duct heater CBRF-AAA-BB

Warnings

- Only authorised technicians are authorised to dismantle and repair this product. Improper handling may result in fire, electric shock or injury.
- If a fault occurs, the power supply must first be switched off.
- The CBRF duct heater is suitable for indoor installation only.
- The CBRF duct heater must not be installed in an explosive or aggressive environment.
- The CBRF duct heater has protection class IP30.

Data

AAA: connection diameter (mm) BB: maximum power x 100 (W)

Туре	CBRF-160-16	CBRF-200-30	CBRF-250-20	CBRF-250-30	CBRF-315-20
Orcon article number	15702166	15702203	15702252	15702253	15702312
Connection voltage (V)	230	230	230	230	230
Power (W)	1600	3000	2000	3000	2000
Air flow min. (m ³ /hour)*	110	170	265	265	420

Туре	CBRF-315-30	CBRF-315-60	CBRF-400-30	CBRF-400-60	CBRF-400-90
Orcon article number	15702313	15702316	15702403	15702406	15702409
Connection voltage (V)	230	400	230	400	400
Power (W)	3000	6000	3000	6000	9000
Air flow min.	420	420	680	680	680
(m3/hour)*					

* The air velocity in the duct here is 1.5m/s.

Application

The electric duct heater is suitable for the following applications, for example (see also Figure 1 and Figure 2 for a schematic representation):

- As post-heating for Orcon GB box fans
- As post-heating for Orcon RVM/RVK tube fans
- As post-heating for Orcon MUB-Multibox fans
- As a pre-heater for Orcon decentralised WTU units: WTU-EC-E, WTU-EC-IE and WTU-EC-TA



Dimensions CBRF





Туре	A (mm)	B (mm)	C (mm)	D (mm)
CBRF-160-16	370	276	71	160
CBRF-200-30	370	276	71	200
CBRF-250-20	370	276	71	250
CBRF-250-30	370	276	71	250
CBRF-315-20	375	277	71	315
CBRF-315-30	375	277	71	315
CBRF-315-60	375	277	71	315
CBRF-400-30	375	277	73	400
CBRF-400-60	375	277	73	400
CBRF-400-90	375	277	73	400

Installation

The electric duct heater can be installed horizontally in any position with the exception of the position where the plenum box is facing downwards. In case of a vertical installation, the air flow should be directed upwards (see Figure 3).

The hose on the differential pressure gauge must be connected to the '- terminal' when the CBRF is operating as a preheater and to the '+ terminal' when the CBRF is operating as an afterheater. The required differential pressure to operate the CBRF is factory set at 20 Pascal.



The temperature sensor should be mounted at a distance of at least three times the duct diameter after the reheater with a minimum of 0.5 metres. Under the hood of the CBRF, the temperature sensor should be connected to terminals 7 and 8 and the electrical power supply to the terminals provided. (The power supply cable is not supplied).



Figure 1 Schematic representation; CBRF as an after-heater



Figure 2 Schematic representation; CBRF as preheater





Operation

When the duct heater is switched on, the controller is in preparation mode for 30 seconds (LED 1 flashes once every 5 seconds). If, after the preparation mode, the air velocity in the duct heater is at least 1.5 m/s AND the pressure difference in the duct with outside the duct is more than the set value, the controller will switch on the heater (LED 1 flashes once per second and LED 2 lights up continuously). If one of the two conditions is not met, the controller will not activate the heating.

The CBRF duct heater works with an external duct temperature sensor (TJ-K10K). The measuring range of the temperature sensor is -30°C to 105°C. The desired air temperature is set with the potentiometer on top of the duct heater.

Overheating protection: The CBRF duct heater has two thermal protections to prevent overheating. The first protection turns off the duct heater when the temperature reaches 50°C. The protection will reset itself if the temperature falls below 50°C again. The second safety device switches off the heater when the temperature reaches 100°C. The only way to reset this protection is to press the button on top of the duct heater.

LED notifications

LED 1 flashes once every 5 seconds: The channel heater is in preparation mode after switching on (30 seconds).

LED 1 flashes once every 5 seconds at a set temperature of 0°C or once every second at a set temperature of more than 0°C, and LED 2 lights up continuously: The heating element is switched on.

LED 1 lights up continuously: There is a fault with one of the following elements: PTC sensor (air velocity sensor), TJ-K10K (temperature sensor) or potentiometer on top of the duct heater.

When the heating supply is switched on after a power failure or after a malfunction, the controller is first in preparation mode for 30 seconds.

Service

Special maintenance on the electric heater is not required. Check the electrical connections once a year. In addition, check for dirt around the heating element and clean if necessary.

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Troubleshooting

Heating element does not heat up.

- 1. *Temperature protection (manual reset) is activated.* Remove the cause of overheating and press the reset button on top of the CBRF duct heater
- 2. *No power supply on the CBRF.* Check all external electrical connections and electrical components (relays, switches, controllers).
- 3. Temperature sensor defective. Check the sensor resistance, it should be $10k\Omega$ at 25°C.
- 4. *Temperature potentiometer defective.* Check the resistance of the potentiometer, it should be $5k\Omega$.
- 5. *Circuit board defective.* Change the circuit board.

The heating element gives full power regardless of the set temperature

- 1. Temperature sensor defective. Check the sensor resistance, it should be $10k\Omega$ at 25°C.
- 2. *Temperature potentiometer defective.* Check the resistance of the potentiometer, it should be $5k\Omega$.
- 3. Triacs defective. Check resistance in Triacs
- 4. *Circuit board defective.* Change the circuit board.

Circuit breaker trips.

- 1. The authorised power of the automaton does not match the absorbed power of the CBRF. Apply a suitable installation automaton.
- 2. A short circuit occurs. Check for damage to the power cables. Check that the CBRF is correctly earthed.
- 3. *The power of the power source is not sufficient.* The power allowed should match the power requested by the CBRF.

Temperature protection is activated.

1. *Air velocity too low through duct heater.* Check filters, fans and ductwork of the system.

Warranty

- 1. Orcon by grants a two-year warranty on the CBRF electric duct heater. The warranty period starts on the production date. The guarantee lapses if:
 - a. the installation was not carried out according to the applicable regulations;
 - b. the defects were caused by incorrect connection, improper use, or contamination of the duct heater;



- c. any wiring changes or repairs have been made by third parties. On-site (dis)assembly costs are not covered by the warranty. If a defect occurs within the warranty period, this should be reported to the installer. Orcon by reserves the right to change the construction and/or configuration of its products at any time without the obligation to modify previously delivered products.
- 2. Orcon is not liable for damage caused during transport or installation.

Dismantling and removal



At the end of the CBRF's service life, the user is responsible for safe dismantling and disposal of the parts according to locally applicable regulations.



Wiring diagrams CBRF



Figure 5 Wiring diagram 1~ 230V



Figure 6 Wiring diagram 3~ 400V

EKR-KN1/3: Temperature controller A: Heating element B: Overheat protection, automatic reset C: Overheat protection, manual reset S: Fuse J: Interlock K: Relay PS: Pressure switch PTC: airflow speedometer TJ-K10K: External temperature sensor