ECO™ heat transfer coolers

MODINE

CGC

CO_2 COOLERS

MANUALE TECNICO
Aeroevaporatori a soffitto

BETRIEBSANLEITUNG
Deckenluftverdampfer

TECHNICAL MANUAL
Ceiling unit coolers

MANUAL TECNICO
Aeroevaporadores de techo

MANUEL TECHNIQUE
Evaporateurs plafonniers

ТЕХНИЧЕСКОЕ РУКОВОДСТВО
Потолочные воздухоохладители

ErP 2015

Important

1. Keep this manual for the lifespan of model.
2. Read technical manual carefully before installation and prior to any intervention on model.
3. Use model exclusively for the purpose for which it has been designed; misuse exempts manufacturer from any responsibility.

Inspection - Transport

1. Upon delivery immediately examine condition of model; should damages be detegced promptly notify forwarder.
2. During transport of model it is necessary to avoid pressure on packaging and it must be kept in upright position as indicated on package.
3. Unpack model as close as possible to installation site. When packaging is removed from model, care must be exercised in order to avoid damage to parts.
4. In order to avoid injury from the model's sharp edges (e.g. fins) during installation and positioning of model use of special protective gloves is recommended.

For a proper installation

1. Verify structural bearing of ceiling in relation to the weight of the unit.
2. Verify that the unit is installed horizontally.
3. Ensure an adequate free space (approx. 30% of the inner room volume) to allow a proper intake and exhaust air circulation.

Particular conditions of installation or operation such as low or beamed rooms, overstorage, obstrugced intake and exhaust air circulation and improper ice build-up due to excessive entry of humidity in room may negatively affect the stated performance and may cause defects.
Standard models may not be suitable for blast freezer and chill room application.

4. The models are equipped with axial fan motors, therefore not suitable for duct ventilation systems and cannot sustain extra static air pressure drops.
5. Verify that the operating conditions (temperatures and pressures) are in accordance to those of project.
6. Care must be exercised during the connecting phase in order to avoid possible distortion of the capillary tubes and shifting of the distributor.
7. In the case of more than one model installed at close range it is advisable to avoid alternate defrostings.
8. Fit the appropriate siphons on the condensate drain connections and assess their efficiency in all working temperatures.
9. Avoid installation of the units next to the cold-room doors.
10. Place the end of defrost temperature feeler in the coldest areas of the coil, i.e. the areas that tend to freeze more (at the end of the cycle the unit should be completely ice-free).
    The position of this device cannot be defined in advance, because it varies in accordance to the type cold room and type of installation.
11. Verify that the electrical feed network is in accordance to the electrical features of model.
12. Ensure that all the electric wiring is in compliance with the standards in force.
13. The units are predisposed for ground wiring connection.
    The unit installer and/or plant operator must ensure the presence of an efficient earthing connection to protect against indirect electric contacts.
    The electric heating elements eventually used for defrosting are housed in junction boxes made of thermoplastic material, with protection rating IP 54.
    Upon request, models can be supplied with coils, defrosting units and fan motors different from the standard ones.
14. The protective film is to be removed from model upon completion of installation.
15. Access to model, for any type of intervention, is reserved to qualified personnel as per regulations in force.

General Maintenance

1. Periodically inspect fastenings, electrical connections and connections to cooling installation.
2. It is necessary to arrange periodical cleaning of unit in order to avoid deposits of toxic substances. Use of mild detergent is recommended; avoid use of solvents, aggressive, abrasive or ammonia-based agents.
3. When replacing electric heaters take particular care during installation in order to avoid damage to the vulcanization; correctly reset wiring and existing fastening systems to avoid possible movement during operation.

The above-mentioned operations are to be carried out by qualified personnel only.

Hazards / Risks

1.  Electric shock. The model is equipped with fan motors and electric defrost heaters. The supply voltage is 400 V AC. It is important to use electrical safety systems that are in compliance to the regulations in force.

2.  Burns. The surface of the electric defrost heaters can reach the temperature of 350 ° C.

3.  Cuts. The heat exchanger is made with fins with sharp edges and the casing is made of sheet metal parts.

4.  Parts in motion. The model is equipped with fan motors fitted with external protection.

5.  Crushing. The weight of unit may exceed 500 kg.

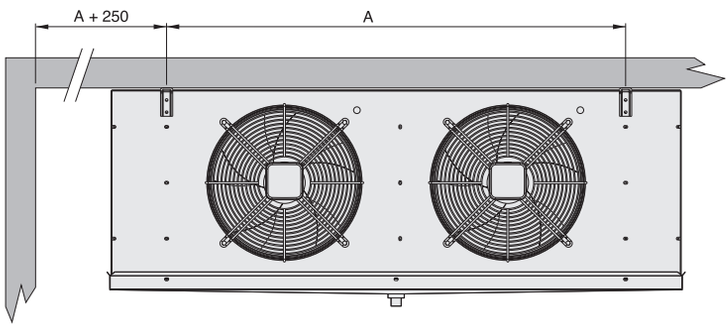
Reference standards

- MACHINES DIRECTIVE 2006/42/EC
- LOW-VOLTAGE DIRECTIVE 2014/35/UE
- ELECTROMAGNETIC COMPATIBILITY DIR. 2014/30/UE
- PED DIRECTIVE 2014/68/UE
- ERP DIRECTIVE 2009/125/EC

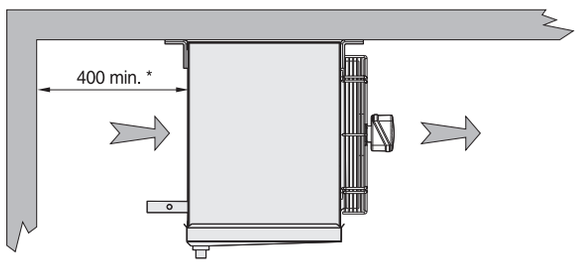
Caution
Before carrying out maintenance on unit, make sure that the electric feed is disconnegced from main power source: the electric parts may be connegced to an automatic control system.

Instructions for a correct installation

Minimum distance from wall on heater side - Minimum distance from wall on suction side



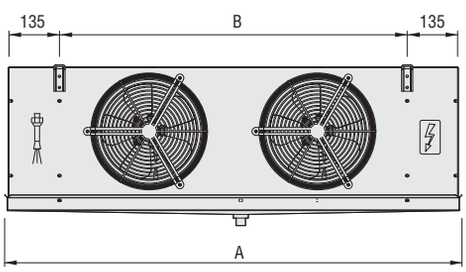
During the installation phase observe the minimum dimension A+250 as to allow an adequate space for the removal and fitting of heaters.

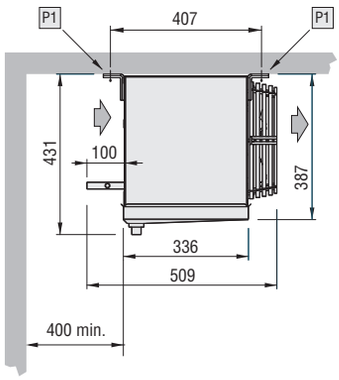


During the installation phase observe the minimun distance of 400 mm as to allow proper functioning of motor.

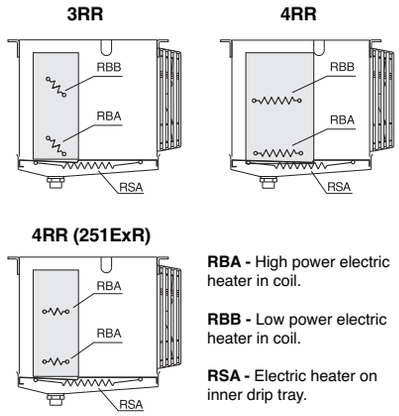
Manufacturing and dimensional features

Model with ø 250 mm fan motor





Positioning of electric heaters

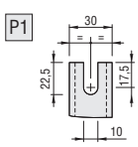


RBA - High power electric heater in coil.

RBB - Low power electric heater in coil.

RSA - Electric heater on inner drip tray.

Fastening detail

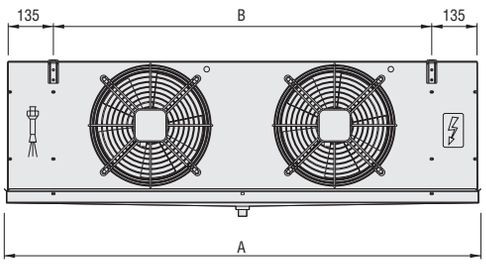


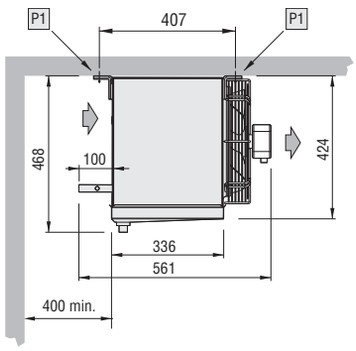
Model	CGC	251 E4R 251 E6R 251 E8R	251 E4 251 E6 251 E8	252 G4 252 G6 252 G8	252 E4 252 E6 252 E8	253 G4 253 G6 253 G8	253 E4 253 E6 253 E8	254 G4 254 G6 254 G8	254 E4 254 E6 254 E8
Fan motors	n° x Ø mm	1x250	1x250	2x250	2x250	3x250	3x250	4x250	4x250
Dimensions	A	674	774	1224	1224	1674	1674	2124	2124
	B	380	480	930	930	1380	1380	1830	1830
Coil connections	In tube (mm)	12	12	12	12	12	12	12	12
	Out tube (mm)	12	12	12	12	12	12	12	12
Drain connection	Ø (GAS)	1"	1"	1"	1"	1"	1"	1"	1"
Net weight	kg	14	16	24	26	33	36	42	46

Use thermostatic valve with external pressure equalizer

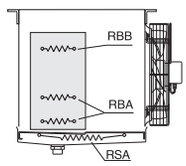
Manufacturing and dimensional features

Model with ø 315 mm fan motor



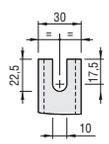


Positioning of electric heaters



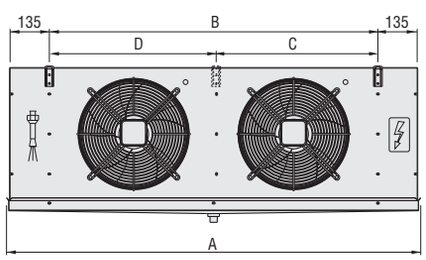
RBA - High power electric heater in coil.
RBB - Low power electric heater in coil.
RSA - Electric heater on inner drip tray.

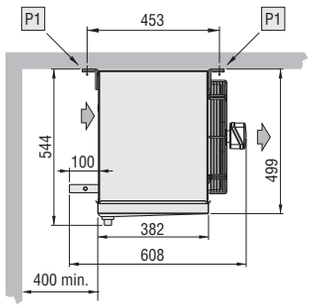
Fastening detail



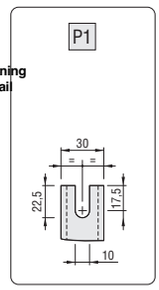
Model	CGC	311F4 311F6 311F8	312F4 312F6 312F8	313F4 313F6 313F8	314F4 314F6 314F8
Fan motors	n° x Ø mm	1x315	2x315	3x315	4x315
Dimensions	A	874	1424	1974	2524
	B	580	1130	1680	2230
Coil connections	In tube (mm)	12	12	12	12
	Out tube (mm)	12	12	12 (F8 16)	16 (F8 22)
Drain connection	Ø (GAS)	1"	1"	1"	1"
Net weight	kg	22	37	52	67

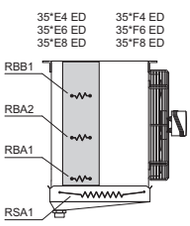
Model with ø 350 mm fan motor

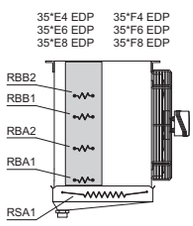


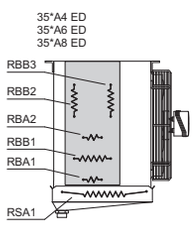


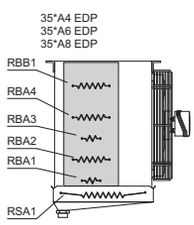
Fastening detail











Positioning of electric heaters

RBA - High power electric heater in coil.
RBB - Low power electric heater in coil.
RSA - Electric heater on inner drip tray.

Model	CGC	351 E4 351 E6 351 E8	351A4 351A6 351A8	352 E4 352 E6 352 E8	352 A4 352 A6 352 A8	353 F4 353 F6 353 F8	353A4 353A6 353A8	354 F4 354 F6 354 F8	354 A4 354 A6 354 A8	355 A4 355 A6 355 A8
Fan motors	n° x Ø	1x350	1x350	2x350	2x350	3x350	3x350	4x350	4x350	5x350
Dimensions	A mm	875	875	1425	1425	1975	1975	2525	2525	3075
	B mm	580	580	1130	1130	1680	1680	2230	2230	2780
	C mm	-	-	-	-	-	-	1115	1115	1665
	D mm	-	-	-	-	-	-	1115	1115	1115
Coil connections	In tube (mm)	12	12	12	12	12	12	12	16	16
	Out tube (mm)	12	12	12	12 (A8 16)	16	16 (A8 22)	16 (F8 22)	22	22
Drain connection	Ø (GAS)	1”	1”	1”	1”	1”	1”	1”	1”	1”
Net weight	kg	24	29	45	53	64	69	85	92	113

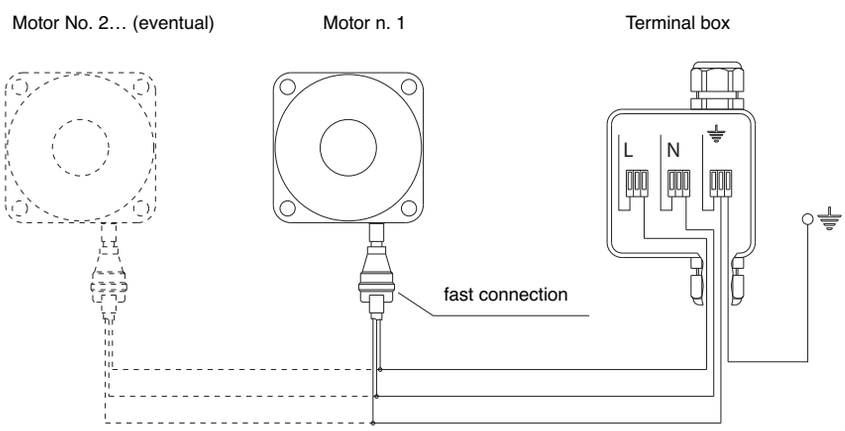
Fan motor connection scheme

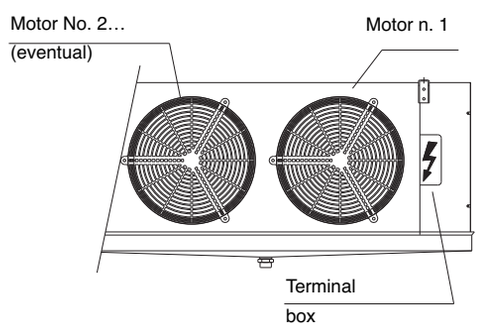
Important
The motors are equipped with inner thermal protection with automatic reconnection.
Before using motor speed control systems verify the compatibility with the motors;
Non compatible systems may damage motors or increase noise level; the manufacturer will not be responsible for model performance with speed control systems.

Modell CGC		**251 E4R 251 E6R 251 E8R**	**251 E4 251 E6 251 E8**	**252G4 252G6 252G8**	**252 E4 252 E6 252 E8**	**253G4 253G6 253G8**	**253 E4 253 E6 253 E8**	**254G4 254G6 254G8**	**254 E4 254 E6 254 E8**	**311F4 311F6 311F8**		**312F4 312F6 312F8**		**313F4 313F6 313F8**		**314F4 314F6 314F8**	
Fan motors		1 x 250		2 x 250		3 x 250		4 x 250		1 x 315		2 x 315		3 x 315		4 x 315	
Frequency	Hz	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60
Fan motors	A	0,68	-	1,36	-	2,04	-	2,72	-	0,52	0,66	1,04	1,32	1,56	1,98	2,08	2,64
absorption	W	95	-	190	-	285	-	380	-	110	148	220	296	330	444	440	592
RPM		1300	1550	1300	1550	1300	1550	1300	1550	1350	1490	1350	1490	1350	1490	1350	1490

Modell CGC		**351 E4 351 E6 351 E8**	**351A4 351A6 351A8**	**352 E4 352 E6 352 E8**	**352 A4 352 A6 352 A8**	**353 F4 353 F6 353 F8**	**353A4 353A6 353A8**	**354 F4 354 F6 354 F8**	**354 A4 354 A6 354 A8**	**355 A4 355 A6 355 A8**	
Fan motors		1 x 350		2 x 350		3 x 350		4 x 350		5 x 350	
Frequency	Hz	50	60	50	60	50	60	50	60	50	60
Fan motors	A	0,96	1,08	1,92	2,16	2,88	3,24	3,84	4,32	4,80	5,40
absorption	W	185	250	370	500	555	750	740	1000	925	1250
RPM		1420	1660	1420	1660	1420	1660	1420	1660	1420	1660

Ø 250 mm fan motor connection scheme

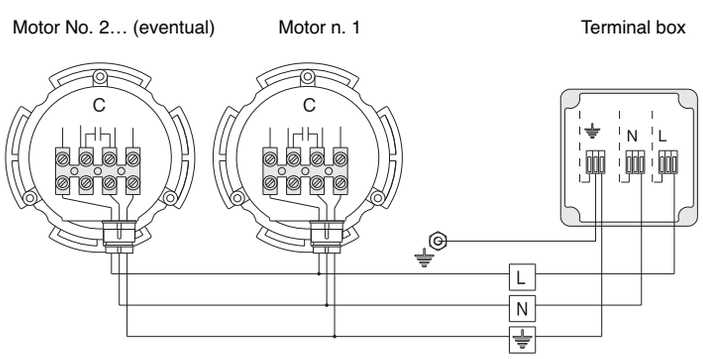


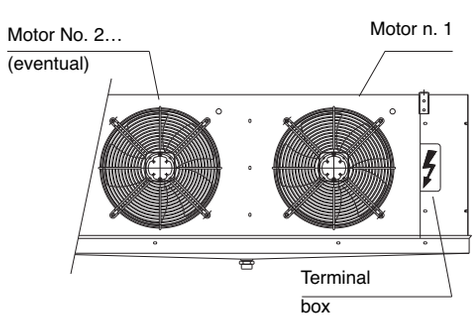


Feed: 230V/1/50-60 Hz

L = brown or grey N = blue ⏚ = green / yellow

Ø 315 - 350 mm fan motor connection scheme





Feed: 230V/1/50-60 Hz

L = brown N = blue ⏚ = green / yellow

English

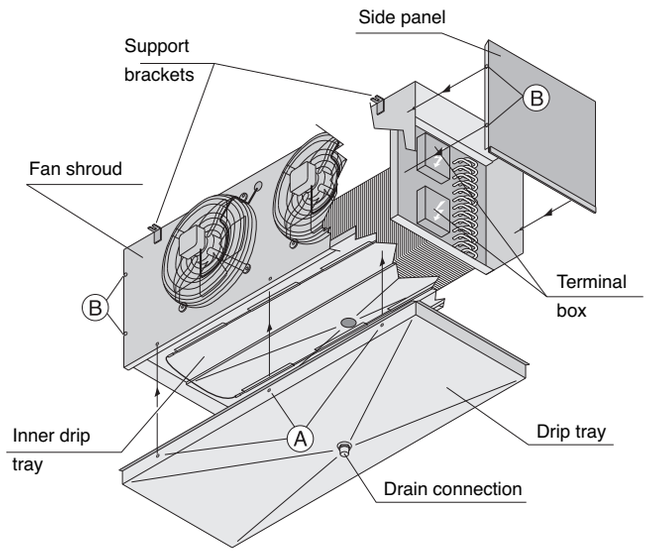
Recommendations for a proper access to model

Access

1. Remove drain connection.
2. Verify that drip tray is free from ice build-up before removing it by unfastening screws “A”.
3. Loosen self-threading screws “B”, without removing completely, then slip off side panel.

Remounting

1. Reposition the side panel and fasten with screws “B”.
2. Reposition drip tray, ensuring that the side panels are placed on the inside and fasten with screws “A”.
3. Reconnect the drain connection.



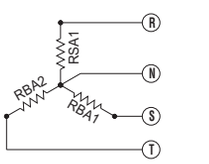
Electric heater connection schemes and electric power

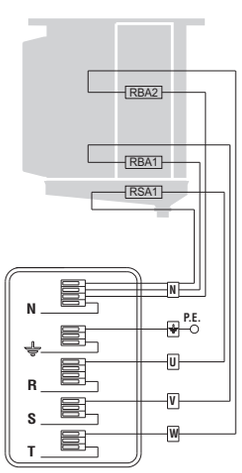
Important
Application of adequate thermal control systems on feeder lines is mandatory.
Performance of all electric heaters must be periodically controlled to avoid damage due to ice build-up.
the manufacturer is not liable in any way for defects caused by non detegced malfunctions.

Model with ø 250 mm fan motor

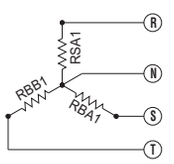
CONNECTION 400V/3/50 Hz **PRESET**

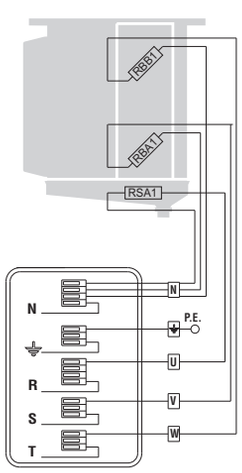
CGC 251ExR



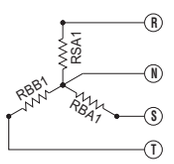


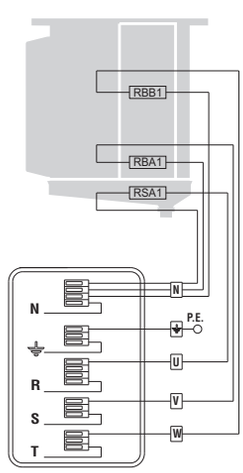
CGC 252Gx
253Gx
254Gx





CGC 251Ex
252Ex
253Ex
254Ex





RBA (1-2)
High power electric heaters in coil.

RBB1
Low power electric heaters in coil.

RSA1
High power electric heater on inner drip tray.

Model CGC “ED”	**251E4R**	**251E4**	**252G4**	**252E4**	**253G4**	**253E4**	**254G4**	**254E4**
ø 250	**251E6R**	**251E6**	**252G6**	**252E6**	**253G6**	**253E6**	**254G6**	**254E6**
	251E8R	**251E8**	**252G8**	**252E8**	**253G8**	**253E8**	**254G8**	**254E8**
Rows	4 RR	4 RR	3 RR	4 RR	3 RR	4 RR	3 RR	4 RR
Total power (W)	750	1125	2250	2250	3325	3325	4375	4375

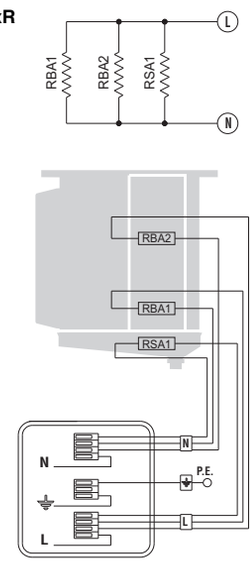
Electric heater connection schemes and electric power

Important
Application of adequate thermal control systems on feeder lines is mandatory.
Performance of all electric heaters must be periodically controlled to avoid damage due to ice build-up.
the manufacturer is not liable in any way for defects caused by non detegced malfunctions.

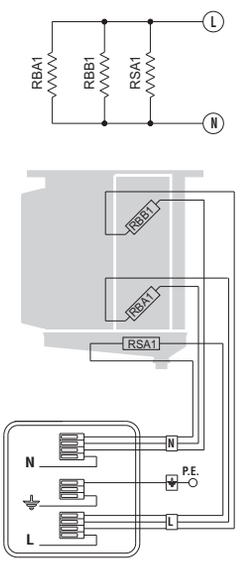
Model with ø 250 mm fan motor

CONNECTION 230V/1/50 Hz **TO SET**

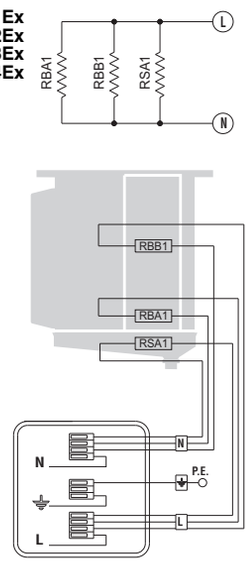
CGC 251ExR



CGC 252Gx
253Gx
254Gx



CGC 251Ex
252Ex
253Ex
254Ex



RBA (1-2)
High power electric heaters in coil.

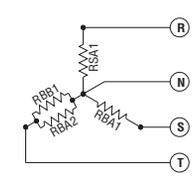
RBB1
Low power electric heaters in coil.

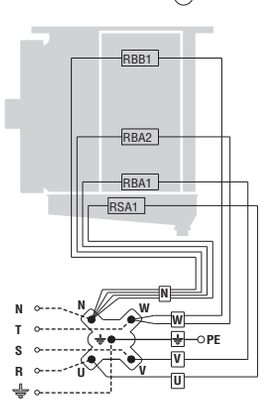
RSA1
High power electric heater on inner drip tray.

Model CGC "ED"	**251E4R**	**251E4**	**252G4**	**252E4**	**253G4**	**253E4**	**254G4**	**254E4**
ø 250	**251E6R**	**251E6**	**252G6**	**252E6**	**253G6**	**253E6**	**254G6**	**254E6**
	251E8R	**251E8**	**252G8**	**252E8**	**253G8**	**253E8**	**254G8**	**254E8**
Rows	4 RR	4 RR	3 RR	4 RR	3 RR	4 RR	3 RR	4 RR
Total power (W)	750	1125	2250	2250	3325	3325	4375	4375

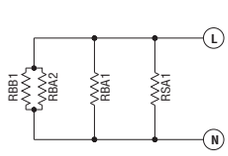
Model with ø 315 mm fan motor

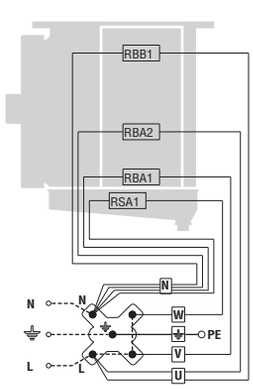
400V/3/50 Hz CONNECTION
(preset)





230V/1/50 Hz CONNECTION
(to set)





RBA (1-2) High power electric heaters in coil.
RBB1 Low power electric heaters in coil.
RSA1 High power electric heater on inner dri

Model CGC "ED"	**311F4**	**321F4**	**313F4**	**314F4**
ø 315	**311F6**	**321F6**	**313F6**	**314F6**
	311F8	**321F8**	**313F8**	**314F8**
Rows	5 RR	5 RR	5RR	5 RR
Total power (W)	1750	3150	4900	6300

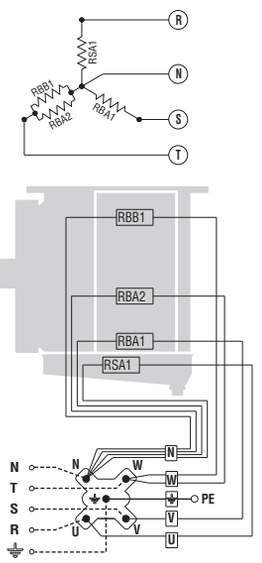
English

Electric heater connection schemes and electric power

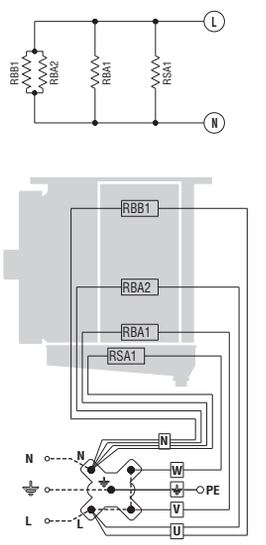
Important
Application of adequate thermal control systems on feeder lines is mandatory.
Performance of all electric heaters must be periodically controlled to avoid damage due to ice build-up.
the manufacturer is not liable in any way for defects caused by non detegced malfunctions.

Model with ø 350 mm fan motor — 4-5 RR standard

400V/3/50 Hz CONNECTION
(preset)



230V/1/50 Hz CONNECTION
(to set)

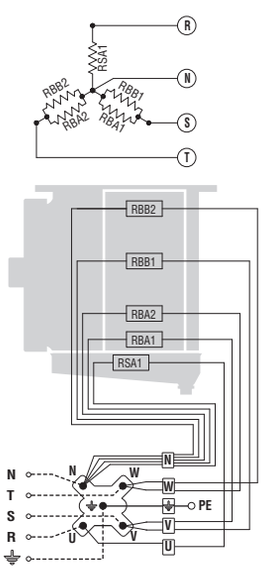


RBA (1-2) High power electric heaters in coil.
RBB1 Low power electric heaters in coil.
RSA1 High power electric heater on inner drip tray.

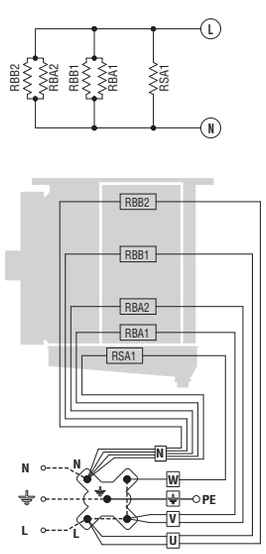
Model CGC "ED"	**351 E4**	**352 E4**	**353 F4**	**354 F4**
ø 350	**351 E6**	**352 E6**	**353 F6**	**354 F6**
	351 E8	**352 E8**	**353 F8**	**354 F8**
Rows	4 RR	4 RR	5 RR	5 RR
Total power (W)	1750	3150	4900	6300

Model with ø 350 mm fan motor — 4-5 RR strengthen

400V/3/50 Hz CONNECTION
(preset)



230V/1/50 Hz CONNECTION
(to set)



RBA (1-2) High power electric heaters in coil.
RBB (1-2) Low power electric heaters in coil.
RSA1 High power electric heater on inner drip tray.

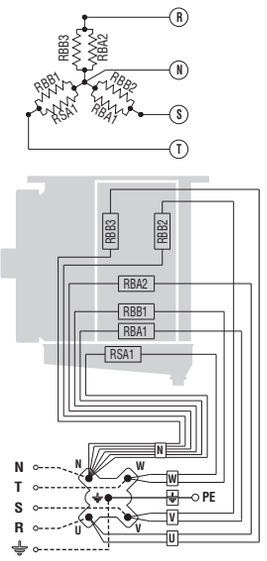
Model CGC "ED"	**351 E4**	**352 E4**	**353 F4**	**354 F4**
ø 350	**351 E6**	**352 E6**	**353 F6**	**354 F6**
	351 E8	**352 E8**	**353 F8**	**354 F8**
Rows	4 RR	4 RR	5 RR	5 RR
Total power (W)	2000	3600	5600	7200

Electric heater connection schemes and electric power

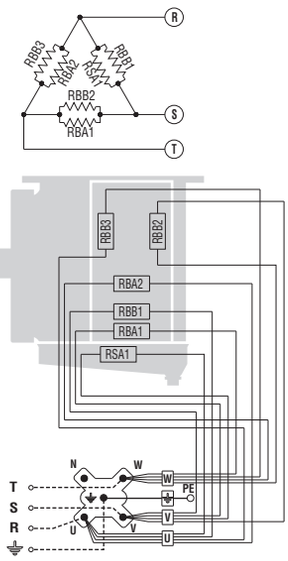
Important
Application of adequate thermal control systems on feeder lines is mandatory.
Performance of all electric heaters must be periodically controlled to avoid damage due to ice build-up.
the manufacturer is not liable in any way for defects caused by non detegced malfunctions.

Model with ø 350 mm fan motor — 6 RR standard

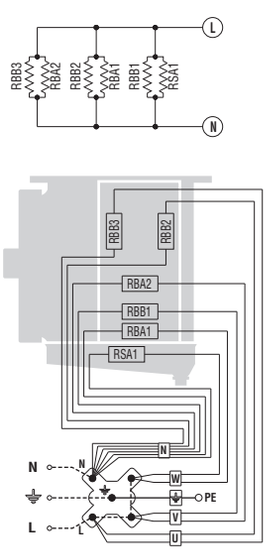
400V/3/50 Hz CONNECTION
(preset)



230V/3/50 Hz CONNECTION
(to set)



230V/1/50 Hz CONNECTION
(to set)

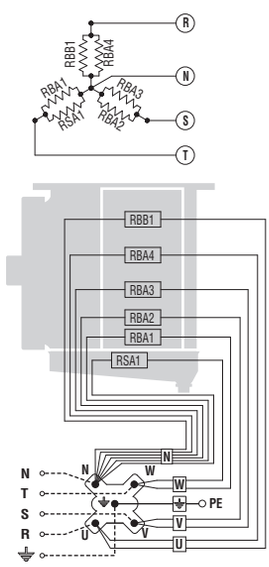


Model CGC "ED"	351 A4	352 A4	353 A4	354 A4	355 A4
ø 350	351 A6	352 A6	353 A6	354 A6	355 A6
	351 A8	352 A8	353 A8	354 A8	355 A8
Rows	6 RR	6 RR	6 RR	6 RR	6 RR
Total power (W)	2250	4050	6300	8100	9900

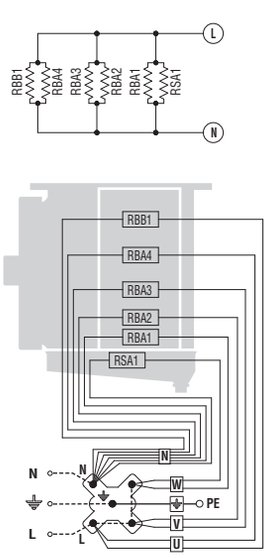
RBA (1-2) High power electric heater in coil.
RBB (1-2-3) Low power electric heaters in coil.
RSA1 High power electric heater on inner drip tray.

Model with ø 350 mm fan motor — 6 RR strengthen

400V/3/50 Hz CONNECTION
(preset)



230V/1/50 Hz CONNECTION
(to set)



RBA (1-2-3-4) High power electric heaters in coil.
RBB1 Low power electric heaters in coil.
RSA1 High power electric heater on inner drip tray.

Model CGC "ED"	351 A4	352 A4	353 A4	354 A4	355 A4
ø 350	351 A6	352 A6	353 A6	354 A6	355 A6
	351 A8	352 A8	353 A8	354 A8	355 A8
Rows	6 RR	6 RR	6 RR	6 RR	6 RR
Total power (W)	2750	4950	7700	9900	12100

English