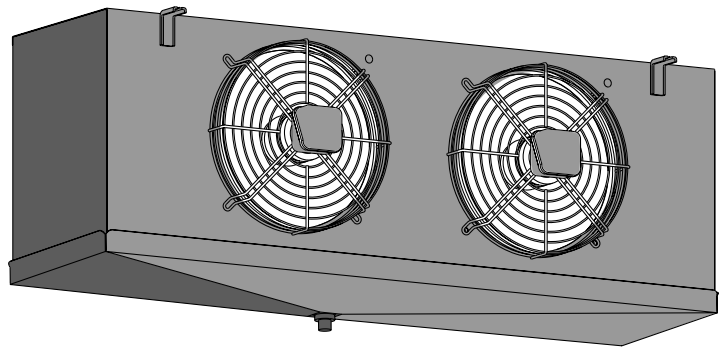


ECO™ heat transfer
coolers



CGC

~~MANUALE TECNICO~~

~~Aeroevaporatori a soffitto~~

~~TECHNICAL MANUAL~~

~~Ceiling unit coolers~~

~~BETRIEBSANLEITUNG~~

~~Deckenluftverdampfer~~

~~MANUAL TECNICO~~

~~Aeroevaporadores de techo~~

~~MANUEL TECHNIQUE~~

~~Evaporateurs plafonniers~~

~~ТЕХНИЧЕСКОЕ РУКОВОДСТВО~~

~~Потолочные воздухоохладители~~

Indice - Istruzioni per l'uso originali
Versione linguistica originale

1. Importante	5
2. Applicazioni	6
3. Identificazione	7
4. Ispezione - Stoccaggio	7
5. Movimentazione e installazione	8
6. Condizioni di installazione	9
7. Caratteristiche costruttive e dimensionali	11
8. Suggerimenti per un corretto accesso all'unità	13
9. Schemi elettrici	14
10. Controlli da eseguire prima della messa in funzione	19
11. Controlli dopo la messa in funzione	19
12. Manutenzione	20
13. Rischi residui	23
14. Norme e direttive di riferimento	25
15. Dati tecnici	26
Dichiarazione di incorporazione – Garanzie	137

Index - Translation of the original instructions

1. Important	27
2. Applications	28
3. Identification	29
4. Inspection - Storage	29
5. Handling and installation	30
6. Installation conditions	31
7. Construction and dimensional features	33
8. Recommendations for a proper access to the model	35
9. Wiring diagrams	36
10. Checks to be performed before start-up	41
11. Checks to be performed after start-up	41
12. Maintenance	42
13. Residual risks	45
14. Reference standards and directives	47
15. Technical data	48
Declaration of incorporation – Warranties	137

Index - Übersetzung der Originalanleitung

1. Wichtig	49
2. Anwendungen	50
3. Identifizierung	51
4. Inspektion - Lagerung	51
5. Handhabung und Montage	52
6. Montagebedingungen	53
7. Konstruktionseigenschaften und Abmessungen	55
8. Ratschläge für einen korrekten Zugang zum Gerät	57
9. Elektrische Pläne	58
10. Kontrollen vor Inbetriebnahme	63
11. Kontrollen nach Inbetriebnahme	63
12. Wartung	64
13. Restrisiko	67
14. Bezugsnormen und Richtlinien	69
15. Technische Daten	70
Einbauerklärung – Garantie	137

Índice - Traducción de las instrucciones originales

1. Importante	71
2. Aplicaciones	72
3. Identificación	73
4. Inspección - Almacenamiento	73
5. Movilización e instalación	74
6. Condiciones de instalación	75
7. Características constructivas y dimensionales	77
8. Sugerencias para un correcto acceso al modelo	79
9. Esquemas eléctricos	80
10. Controles antes de la puesta en funcionamiento	85
11. Controles después de la puesta en funcionamiento	85
12. Mantenimiento	86
13. Riesgos restantes	89
14. Normas y directivas de referencia	91
15. Datos técnicos	92
Declaración de incorporación – Garantías	137

Index - Traduction des instructions originales

1. Important	93
2. Applications	94
3. Identification	95
4. Inspection - Stockage	95
5. Manutention et installation	96
6. Conditions d'installation	97
7. Caractéristiques constructives et dimensionnelles	99
8. Instructions pour accéder à l'appareil	101
9. Schémas électriques	102
10. Contrôles à effectuer avant la mise en marche	107
11. Contrôles à effectuer après la mise en marche	107
12. Entretien/maintenance	108
13. Risques résiduels	111
14. Normes et directives de référence	113
15. Données techniques	114
Déclaration d'incorporation – Garanties	137

Содержание - Перевод оригинала инструкции

1. Важно	115
2. Использование	116
3. Идентификация	117
4. Проверка - Хранение	117
5. Транспортировка и установка	118
6. Условия установки	119
7. Конструкция и габаритные характеристики	121
8. Рекомендации по корректному доступу к аппарату	123
9. Схемы подключения	124
10. Контроль перед вводом в эксплуатацию	129
11. Контроль после ввода в эксплуатацию	129
12. Техобслуживание	130
13. Остаточные риски	133
14. Справочные стандарты и директивы	135
15. Технические Данные	136
Декларация о включении – Гарантия	137

1. Important

- 1.1 Carefully read all the information in this manual before removing the packaging, before handling, assembling, positioning, commissioning of the machine and before performing any work on the model. If in doubt contact Modine.
- 1.2 This manual is an integral part of the product and must be kept for the entire life of the unit.
- 1.3 Modine declines all responsibility for damage to persons and property caused by failure to follow all instructions contained in this manual.
- 1.4 The unit must only be used for the purpose for which it was expressly designed: improper use releases Modine from any liability.
- 1.5 This manual must be kept available near the unit for the entire life of the same.
- 1.6 The use of fluids or substances which could corrode, make unsafe or reduce the performance of the unit is prohibited.
- 1.7 It is forbidden to modify or tamper with the components of the unit.
- 1.8 The Customer is solely responsible for compliance with the regulations relating to installation and operation of the unit.
- 1.9 The use of a fluid other than that specified in the technical documentation (see Chapter 15) is forbidden, voids the warranty and could expose you to a chemical hazard.
- 1.10 For any use other than that specified, contact the Modine technical department.
- 1.11 Modine assumes no responsibility for any accidents, losses or damage resulting from improper use of the equipment that must be properly installed by qualified personnel in accordance with intended use and subjected to preventive maintenance to protect the safety of persons, animals and property. The units produced are compliant with the applicable Essential Safety Requirements (ESRs) of the Machinery Directive as required by the standard operating conditions described in the manual.
- 1.12 It is the responsibility of the installer/designer of the system to comply with the current regulations and legislation and to assess its safety before putting it into service.
- 1.13 Any operation other than that indicated in this manual must be agreed in advance with Modine. Failure to do so will invalidate the warranty.
- 1.14 This manual reflects the state of the art at the time of marketing of the product and therefore cannot be regarded as inappropriate in the case that evolution of the design and construction methods require updating of the data expressed.
- 1.15 Install the unit in compliance with all local legislation and regulations.
- 1.16 All operations described in this manual must be carried out by authorised and qualified personnel who have the necessary training and skills in accordance with EN 378. Persons under the influence of drugs, alcohol or medication that impair alertness are not permitted to carry out any operations. Work is only permitted if an order to that effect has been given.
- 1.17 The design, construction and operation of the refrigeration plant where the unit is to be installed shall follow the requirements and criteria specified in EN 378.
- 1.18 The safety prescriptions and requirements for the use of refrigerants belonging to groups A1, A2L must be in accordance with the provisions of EN 378 and the safety data sheets for each fluid used.
- 1.19 If something unexpected happens, stop the unit immediately and call maintenance; do not restart the unit until normal operating conditions have been restored.
- 1.20 Arrange and plan measures in the event of an emergency on the system, e.g. install a fault indicator system, in order to avoid damage to persons and property.
- 1.21 Do not use the model in case of a leak. In case of leakage initiate emergency measures and secure the system according to the applicable regulations.
- 1.22 The unit, limited to the operating conditions described in this manual, complies with the applicable standards of the Machinery Directive.
- 1.23 Pay attention to the nature of the fluid used, CO₂ R744.

CO₂ (carbon dioxide) is an odourless, colourless, non-flammable, chemically stable gas which is heavier than air. It therefore tends to stratify and accumulate near the floor in closed, unventilated rooms.

According to EN 97/23/EG it is classified as refrigerant L1/A1.

Exposure limits are:

- TLV: 5000 ppm as TWA; 30000 ppm as STEL.
- MAK: 9100 mg/m³, 5000 ppm; peak limitation category: II(2).

- EU-OEL: 9000 mg/m³, 5000 ppm as TWA.

A concentration above 100000 ppm may cause pulmonary oedema and be fatal.

Continuous monitoring of CO₂ concentration is recommended when installing models in confined spaces.

- 1.24 If you have any doubts or queries, please contact Modine or the dealer.

2. Applications

- 2.1 The unit must not be put into service until the machine to which it will be incorporated has been declared in conformity with the Machinery Directive 2006/42/CE, see "Declaration of Incorporation" page 137. The unit is defined as "Partly completed machinery".
- 2.2 The product must only be used for the stated purpose: use other than that prescribed is to be considered improper and exempts Modine from all liability.
- 2.3 Use in unspecified operating conditions must be considered incorrect or improper.
- 2.4 Make sure that the fluids used are compatible with the materials used to build up the model. Bear in mind that the CO₂ available on the market may contain small quantities of water: check that the concentration of water in the CO₂ is compatible with all the components of the system.
- 2.5 The minimum protection level of the model is IP44. Refer to the annexe "ADDITIONAL INFORMATION SHEET" (when present).
- 2.6 All the models are supplied with heat exchangers manufactured to internal standards in accordance with DIN8964 for internal cleaning.
- 2.7 Please refer to any attachments to this manual.
- 2.8 Product description (see identification code, Chapter 15.2):
 - 2.8.1 CGC Aeroevaporators (Unit Coolers) with CO₂ refrigerant series CGC have the task of optimising the heat exchange between air and another fluid, CO₂, in a refrigeration system. Inside a casing there is a heat exchanger consisting of a finned pack interconnected to a tube coil. The flow of relatively warm ambient air, created by the axial fans, passes through the exchanger where the evaporation of the liquid flowing through the tubes takes place, resulting in the absorption of the heat and the lowering of the outlet air temperature.

3. Identification

- 3.1 For any communication, request for assistance or spare parts, please provide the model name and serial number shown on the data plate:

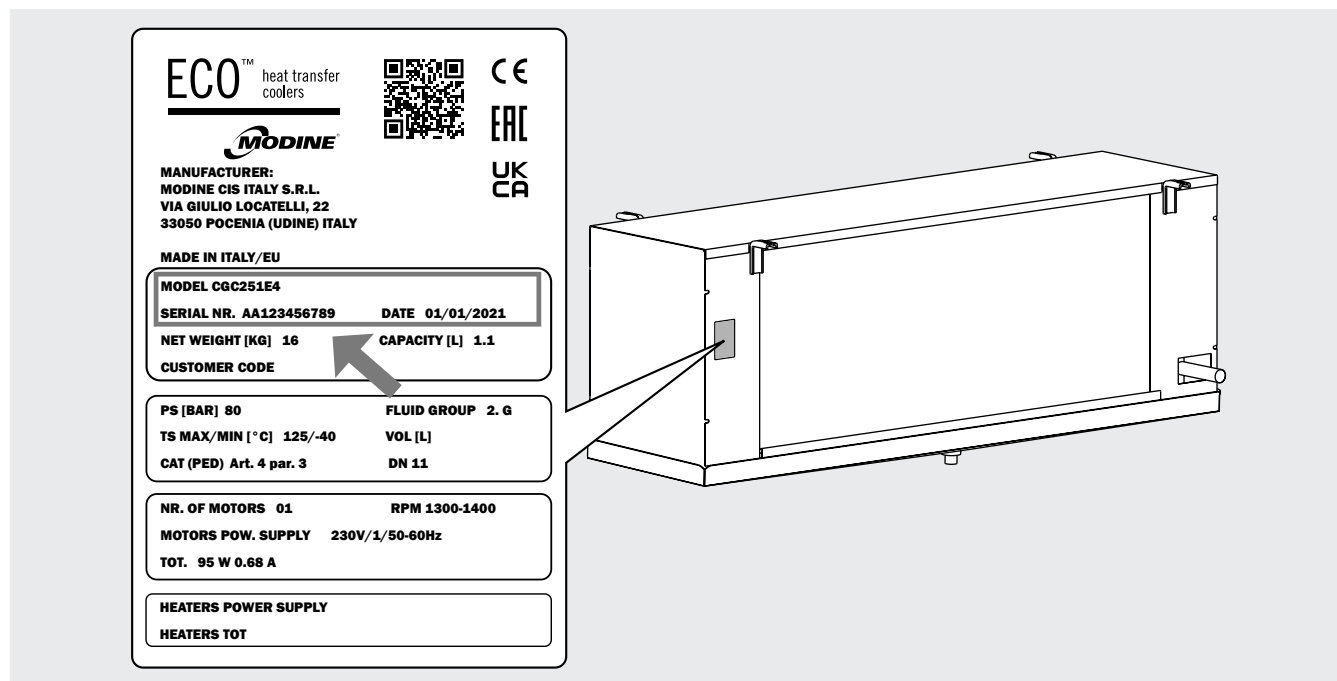


Figure 1

4. Inspection - Storage

- 4.1 Upon receipt of the model immediately check its state of integrity; immediately dispute with the transport company any damage. The packaging is created according to the model, to the suitable means of transport and of handling.
- 4.2 The heat exchangers of the models are supplied with a pre-charge of dry air at 2 bar and have load couplings of 1/4" SAE. Check for the presence of pressure. In the absence of pressure immediately contact Modine and report the problem on the transport document. Insufficient pressure indicates a loss due to damage incurred during transportation.

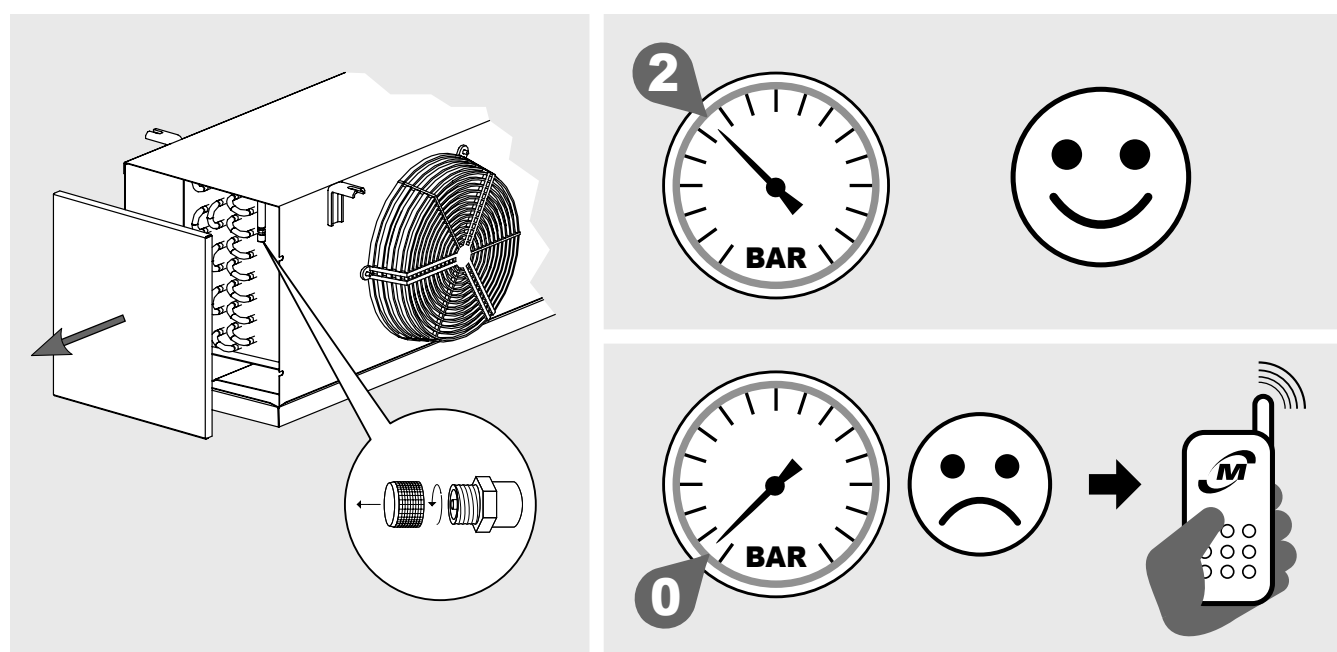


Figure 2

- 4.3 The model must be stored in its original packaging in a place that is protected and away from weathering.
- 4.4 Do not place any other material on top of the packaging.
- 4.5 If the model is allowed to be stacked, follow the instructions on the packaging.
- 4.6 If a motor fan is switched OFF for a long period of time, it must be switched ON for at least 2 hours every month to remove any traces of condensation that may have formed inside the motor.
- 4.7 The following rules apply when the unit must remain in storage for long periods of time. The unit must be stored indoors and positioned according to the instructions on the package. During storage, the fans must be manually rotated at least once every 3 months.

5. Handling and installation

- 5.1 The models are supplied in a cardboard box and/or wooden cage.
- 5.2 The packaged model must be moved by qualified personnel using forklift trucks of suitable capacity, or with crane and/or overhead crane (see Chapter 7). The lifting brackets must be longer than the depth of the packaging and/or of the model. Avoid any abrupt movement and do not stand close to the manoeuvring area. Always ensure that the models are secured to the hoists before handling operations. A heavy impact or a strong thrust can overturn the model.

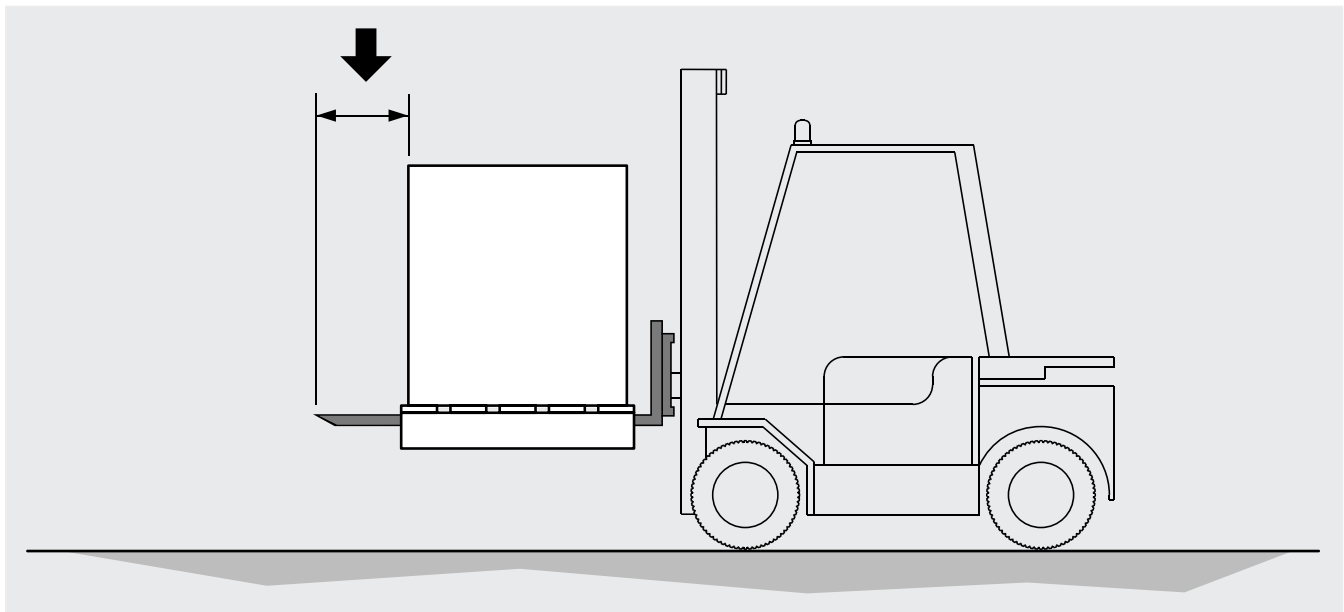


Figure 3

- 5.3 The model must always be kept in position as indicated on the packaging.
- 5.4 Avoid applying improper pressure to the packaging during handling. Take care not to damage the headers.
- 5.5 Unpack the unit close to the installation site.
- 5.6 Always use PPE (Personal Protection Equipment) during handling and installation, e.g. gloves that are sufficiently resistant to mechanical hazards, to reduce the risk of injury in the event of contact with sharp sheet metal edges or the finned pack.
- 5.7 It is essential to take all the necessary measures to ensure the complete safety of the operators in order to prevent the model from accidentally falling against people. It is forbidden to work under a suspended load. It is advisable to prepare a structure of greater capacity than the weight to be supported (trestle or props) on which to place the model.
- 5.8 When installation is complete, remove the protective film covering the model.
- 5.9 When installation is complete, dispose of packaging according to local regulations.
- 5.10 If brackets are provided, install and maintain them for future use.

6. Installation conditions

- 6.1 The model described in this manual is a component of a system and must be installed by authorised personnel only.
- 6.2 Access to the unit for any type of intervention must be reserved to personnel qualified to operate the system, in accordance with the regulations in force.
- 6.3 The place of installation must conform to what is prescribed by local legislation.
- 6.4 The support structure must be suitable for the weight of the model in running condition (see Chapter 7).
- 6.5 This unit must not be installed in a potentially explosive or acidic atmosphere or in one that is not compatible with the materials it is made of (copper, aluminium, steel, polymers).
- 6.6 Verify that the unit is installed horizontally.
- 6.7 The unit is not designed to act as a support for other machines or structures.
- 6.8 Avoid installation of the units next to the cold-room doors.
- 6.9 Ensure an adequate free space (approx. 30% of the inner room volume) to allow a proper intake and exhaust air circulation. Keep the minimum distance so as to take out / insert the heaters.

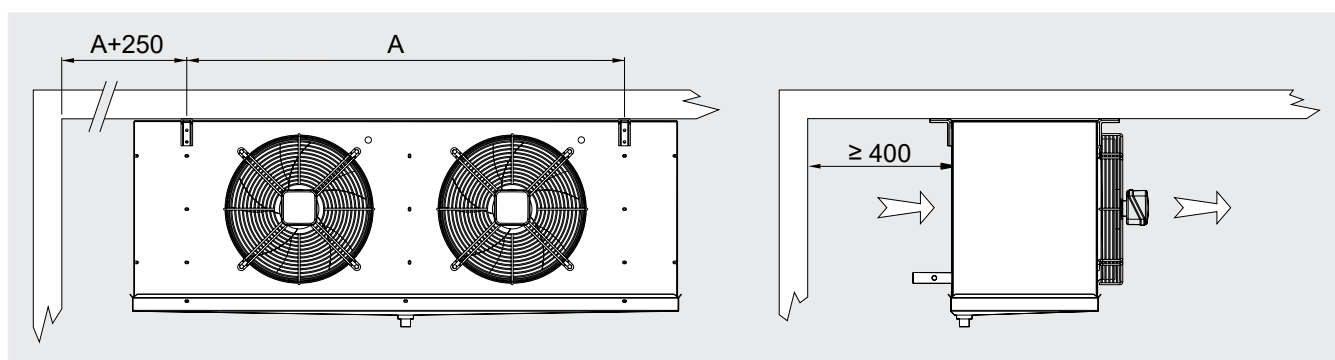


Figure 4

- 6.10 Particular conditions of installation or operation such as low or beamed rooms, overstorage, obstructed 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.
- 6.11 Standard models may not be suitable for operation in tunnels or blast chilling/rapid freezing cells.
- 6.12 The units are equipped with axial motorised fans, therefore they are not suitable for channelling or for supporting additional static heads. Check with Modine for special requirements.
- 6.13 Verify that the operating conditions (temperatures and pressures) are in accordance to those of project.
- 6.14 Care must be exercised during the connecting phase in order to avoid possible distortion of the capillary tubes and shifting of the distributor.
- 6.15 Fit the appropriate siphons on the condensate drain connections and assess their efficiency in all working temperatures.
- 6.16 This unit must be integrated in an industrial electromagnetic environment, which falls within the emission and immunity limits of the standards currently in force.
- 6.17 Check that the power supply line is suitable for the electrical characteristics of the unit.
- 6.18 Check that all electrical connections are in accordance with applicable standards.
- 6.19 The unit installer and/or plant operator must ensure the presence of an efficient earthing connection to protect against indirect electric contacts.
- 6.20 The units are predisposed for ground wiring connection (see Chapter 8).
- 6.21 When installing temperature or pressure probes, place them in the most appropriate area: the point cannot be defined in advance as it varies according to the type of installation and the type of system.
- 6.22 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 of cold room and type of installation.
- 6.23 When installing external control devices, check their compatibility with the electrical characteristics of the unit.

- 6.24 For installations at height, use elevating platforms, scaffolding or trestles.
- 6.25 If the unit is equipped with an electric defrosting device with resistors (connections cabled in a thermoplastic junction box), define the number and frequency of the switch-ons of the resistors and periodically check their functionality.
- 6.26 In the case of more than one model installed at close range it is advisable to avoid alternate defrostings.
- 6.27 Upon request, models can be supplied with coils, defrosting units and fan motors different from the standard ones.
- 6.28 Discharge the pre-charge pressure (approx. 2 bar) from the heat exchanger before cutting the inlet and/or outlet sleeves.

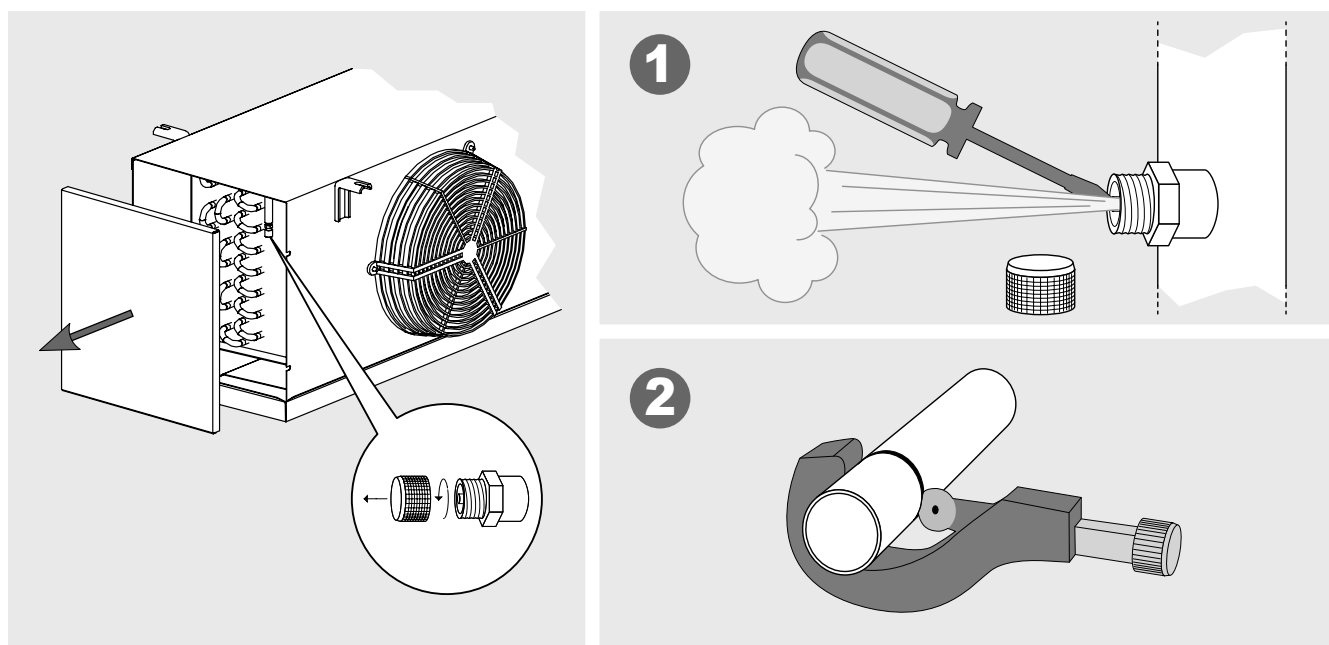
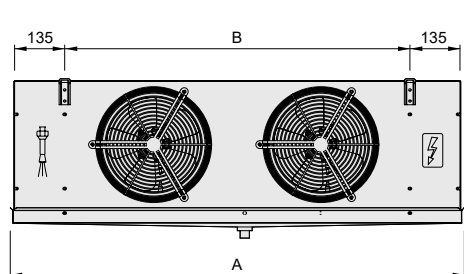


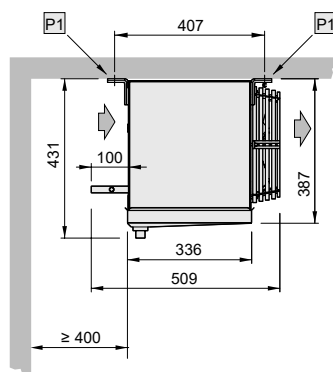
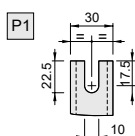
Figure 5

7. Construction and dimensional features

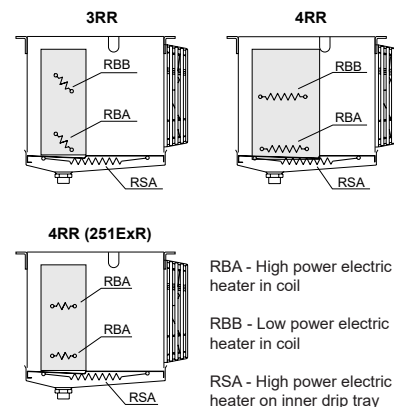
Ø250 fan diameter unit



Fastening detail



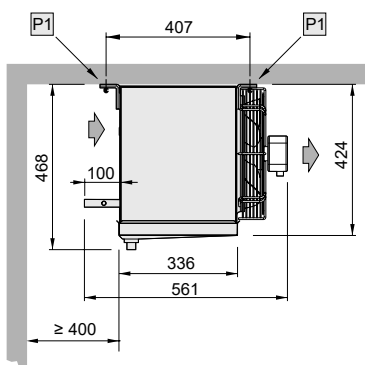
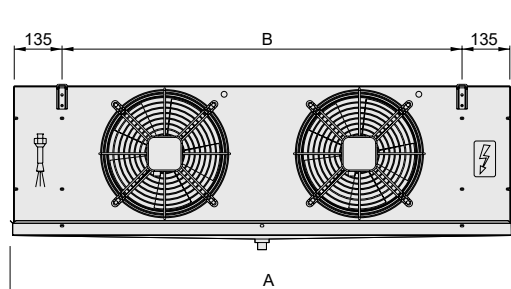
Positioning of electric heaters



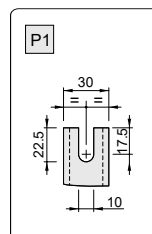
Model	CGC	251E4R 251E6R 251E8R	251E4 251E6 251E8	252G4 252G6 252G8	252E4 252E6 252E8	253G4 253G6 253G8	253E4 253E6 253E8	254G4 254G6 254G8	254E4 254E6 254E8
Motorfans	n° x Ø mm	1x250	1x250	2x250	2x250	3x250	3x250	4x250	4x250
Dimensions	A [mm]	674	774	1224	1224	1674	1674	2124	2124
	B [mm]	380	480	930	930	1380	1380	1830	1830
Coil connections	In [mm]	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
	Out [mm]	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
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

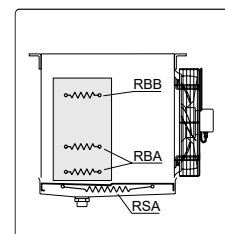
Ø315 fan diameter unit



Fastening detail



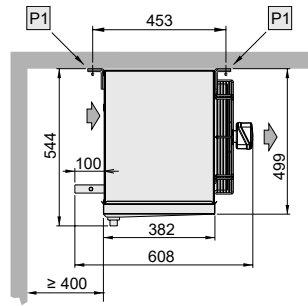
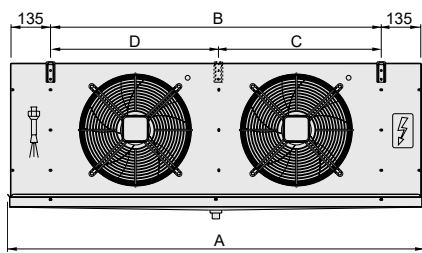
Positioning of electric heaters



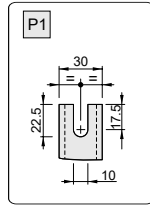
Model	CGC	311F4 311F6 311F8	312F4 312F6 312F8	313F4 313F6 313F8	314F4 314F6 314F8
Motorfans	n° x Ø mm	1x315	2x315	3x315	4x315
Dimensions	A [mm]	874	1424	1974	2524
	B [mm]	580	1130	1680	2230
Coil connections	In [mm]	12.7	12.7	12.7	12.7
	Out [mm]	12.7	12.7	12.7 (F8 15.87)	15.87 (F8 22.23)
Drain connection	Ø (GAS)	1"	1"	1"	1"
Net weight	kg	22	37	52	67

Use thermostatic valve with external pressure equalizer

Ø350 fan diameter unit

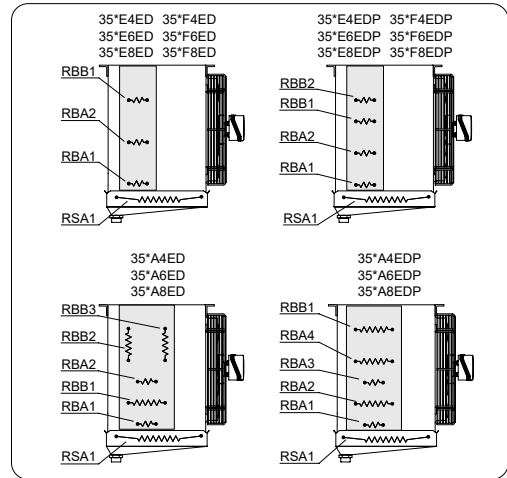


Fastening detail



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

Positioning of electric heaters



Model	GCE	351E4	351A4	352E4	352A4	353F4	353A4	354F4	354A4	355A4
		351E6	351A6	352E6	352A6	353F6	353A6	354F6	354A6	355A6
		351E8	351A8	352E8	352A8	353F8	353A8	354F8	354A8	355A8
Motorfans	n° x Ø mm	1x350	1x350	2x350	2x350	3x350	3x350	4x350	4x350	5x350
Dimension	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 [mm]	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7 (A8 15.87)
	Out [mm]	12.7	12.7	12.7	12.7 (A8 15.87)	15.87 (F8 22.23)	15.87 (A8 22.23)	15.87 (F8 22.23)	22.23	22.23
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

Use thermostatic valve with external pressure equalizer

8. Recommendations for a proper access to the model

Access

- 8.1 Remove R1 drain connection.
- 8.2 Verify that drain pan L1 is free from ice build-up before removing it by unfastening the screws "A".
- 8.3 Loosen self-threading screws "B", without removing them completely, then slip off the side panel L5.

Reassembling

- 8.4 Reposition the side panel L5 and fasten with screws "B".
- 8.5 Reposition drain pan L1, ensuring that the side panels are placed on the inside and fasten with screws "A".
- 8.6 Reconnect R1 drain connection.

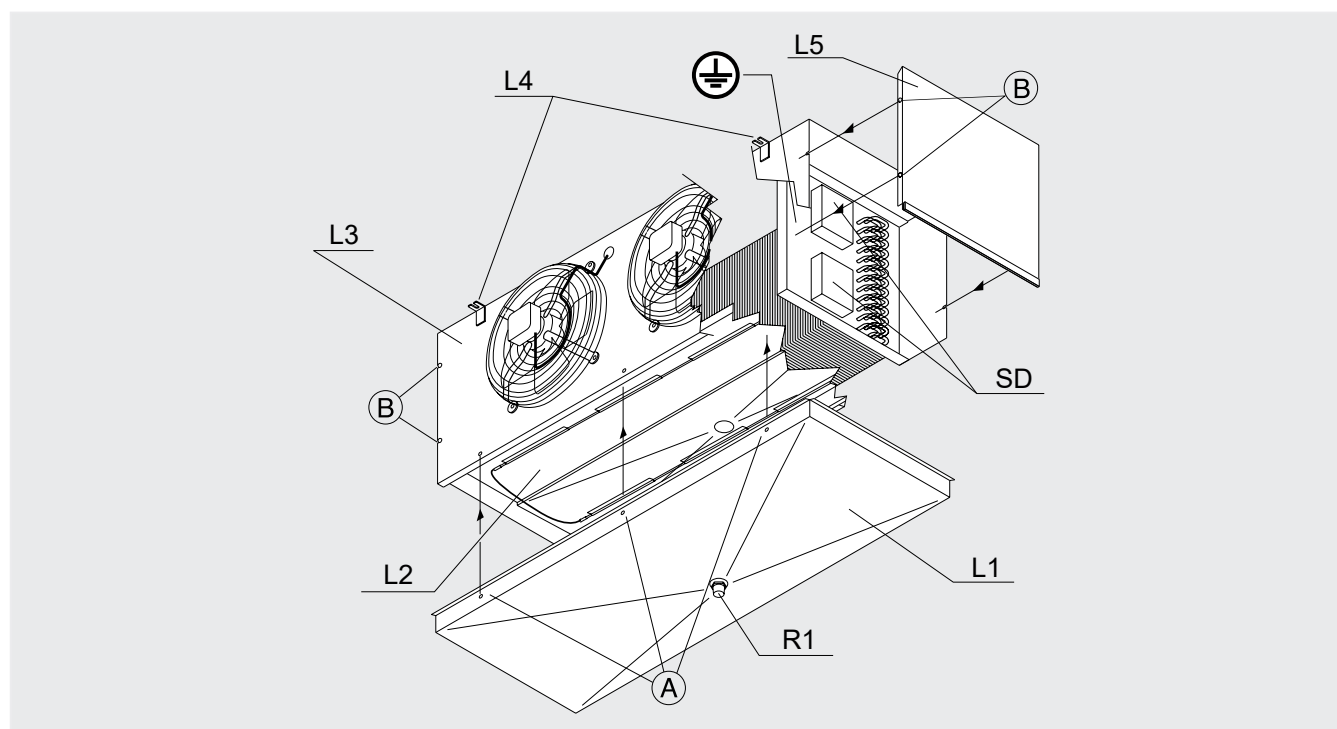


Figure 6

- L1 = Drain pan
- L2 = Inner drip tray
- L3 = Fan shroud
- L4 = Supports
- L5 = Side panel
- R1 = Drain connection
- SD = Junction boxes (fans and heaters)
-  = Ground pole

9. Wiring diagrams

Motor-fan connection diagram

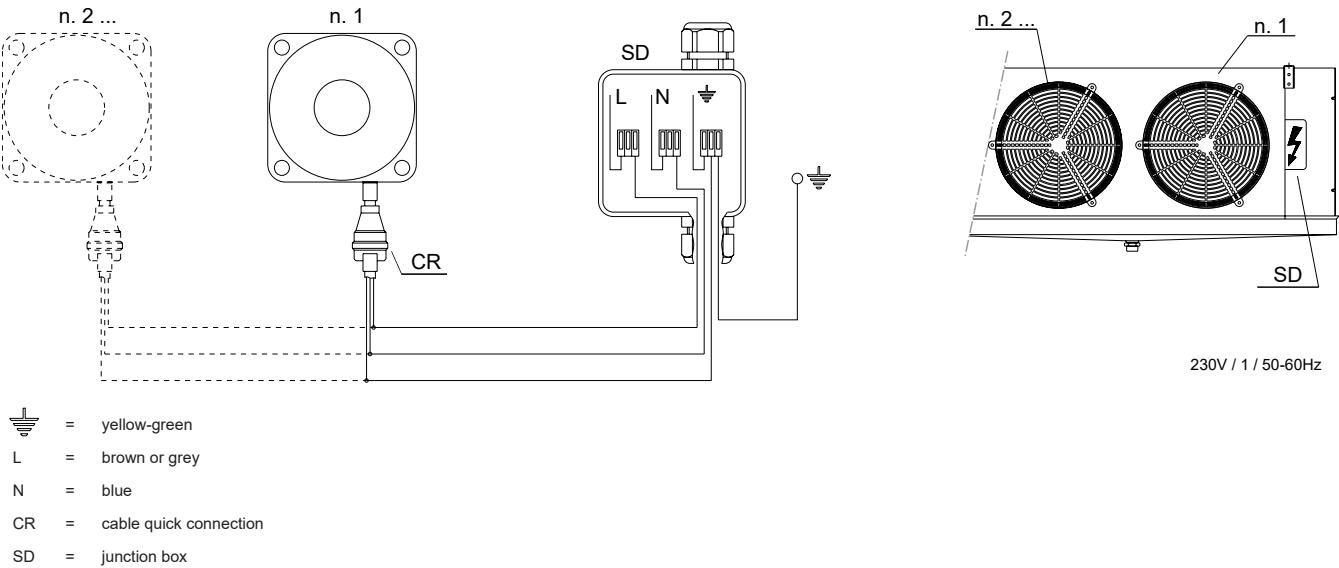
Important. The motors are equipped with inner thermal protection with automatic reconnection. Before using motor speed control systems verify the compatibility with the motors. Non compatible systems may damage motors or increase noise level; Modine will not be responsible for model performance with speed control systems. For fans equipped with thermal contacts (TK), these must be connected to the control circuit. For models supplied with wiring in a junction box, remove the cover to make the connection.

Model	GCE	251E4R	251E4	252G4	252E4	253G4	253E4	254G4	254E4
		251E6R	251E6	252G6	252E6	253G6	253E6	254G6	254E6
		251E8R	251E8	252G8	252E8	253G8	253E8	254G8	254E8
Motorfans	n° x Ø mm	1x250		2x250		3x250		4x250	
Frequency	Hz	50	60	50	60	50	60	50	60
Electrical consumption	A	0.66	0.66	1.32	1.32	1.98	1.98	2.64	2.64
	W	95	95	190	190	285	285	380	380
RPM		1300	1400	1300	1400	1300	1400	1300	1400

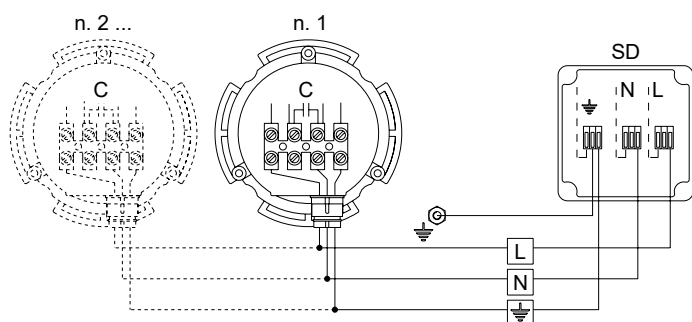
Model	GCE	311F4	311F6	311F8	312F4	312F6	312F8	313F4	313F6	313F8	314F4	314F6	314F8
		311F4	311F6	311F8	312F4	312F6	312F8	313F4	313F6	313F8	314F4	314F6	314F8
		311F4	311F6	311F8	312F4	312F6	312F8	313F4	313F6	313F8	314F4	314F6	314F8
Motorfans	n° x Ø mm	1x315			2x315			3x315			4x315		
Frequency	Hz	50	60		50	60		50	60		50	60	
Electrical consumption	A	0.52	0.66		1.04	1.32		1.56	1.98		2.08	2.64	
	W	110	148		220	296		330	444		440	592	
RPM		1350	1490		1350	1490		1350	1490		1350	1490	

Model	GCE	351E4	351A4	352E4	352A4	353F4	353A4	354F4	354A4	355A4
		351E6	351A6	352E6	352A6	353F6	353A6	354F6	354A6	355A6
		351E8	351A8	352E8	352A8	353F8	353A8	354F8	354A8	355A8
Motorfans	n° x Ø mm	1x350		2x350		3x350		4x350		5x350
Frequency	Hz	50	60	50	60	50	60	50	60	50 60
Electrical consumption	A	0.96	1.08	1.92	2.16	2.88	3.24	3.84	4.32	4.80 5.40
	W	185	250	370	500	555	750	740	1000	925 1250
RPM		1450	1700	1450	1700	1450	1700	1450	1700	1450 1700

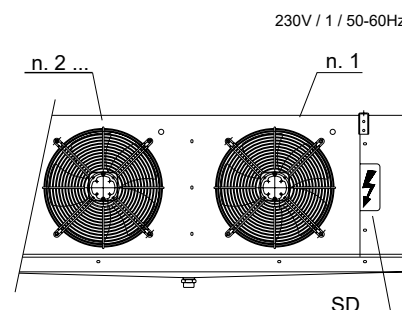
Ø250 fan diameter unit



Ø315-Ø350 fan diameter unit



- = yellow-green
 L = brown
 N = blue
 SD = junction box

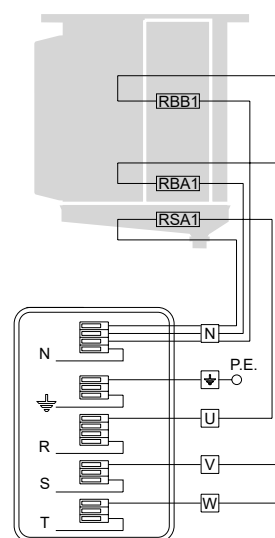
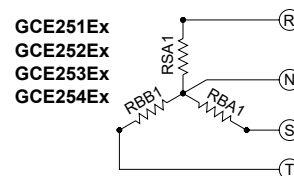
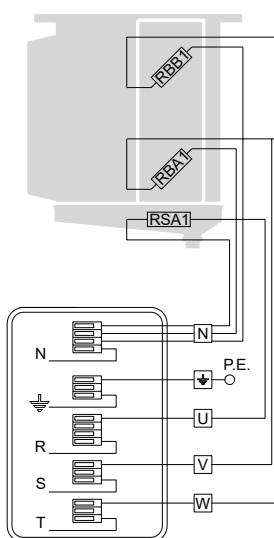
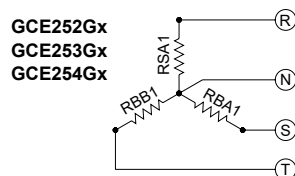
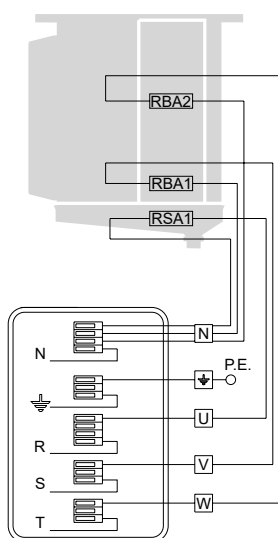
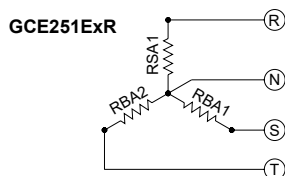


Heater connection diagram

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. Modine is not liable in any way for defects caused by non detected malfunctions. For models supplied with wiring in a junction box, remove the cover to make the connection. It is compulsory to use power cables with a minimum cross-section according to the technical standards in force in the country of installation, depending also on the laying method, the length of the cables and their type. To minimise the risk of indirect contact, it is advisable to earth the unit, using the earth pole (where present). For further information please refer to the diagrams supplied with the model.

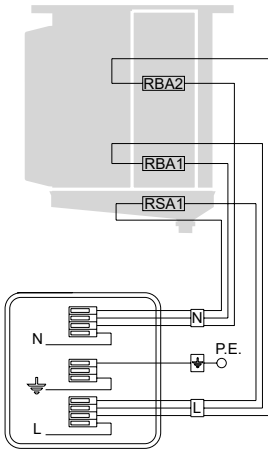
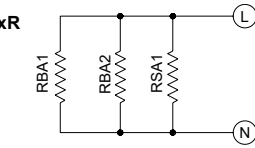
Ø250 fan diameter unit

Connection 400V/3/50-60Hz STANDARD

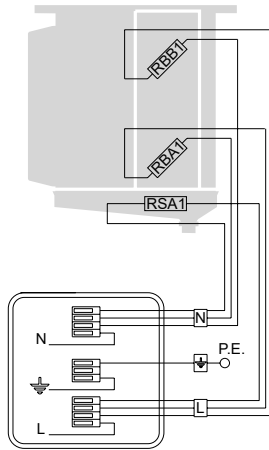
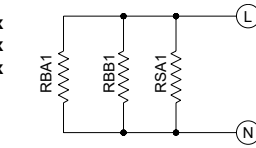


Connection 230V/1/50-60Hz to be set

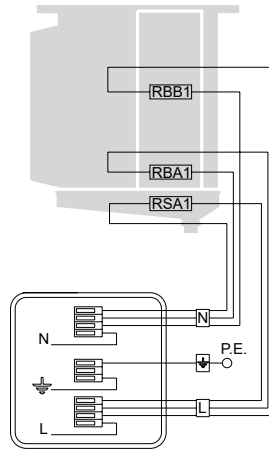
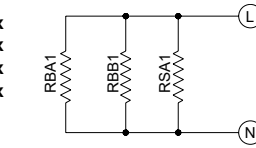
GCE251ExR



GCE252Gx
GCE253Gx
GCE254Gx



GCE251Ex
GCE252Ex
GCE253Ex
GCE254Ex

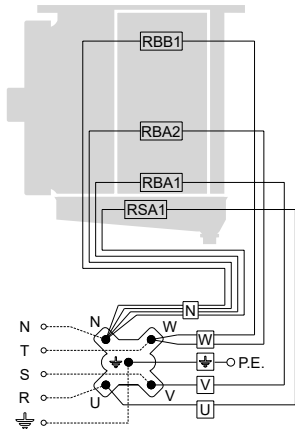
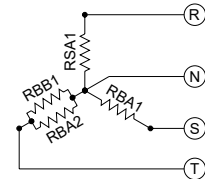


Model	CGC "ED"	251E4R	251E4	252G4	252E4	253G4	253E4	254G4	254E4
	Ø250	251E6R	251E6	252G6	252E6	253G6	253E6	254G6	254E6
		251E8R	251E8	252G8	252E8	253G8	253E8	254G8	254E8
Rows		4	4	3	4	3	4	3	4
Total power	W	750	1125	2250	2250	3325	3325	4375	4375

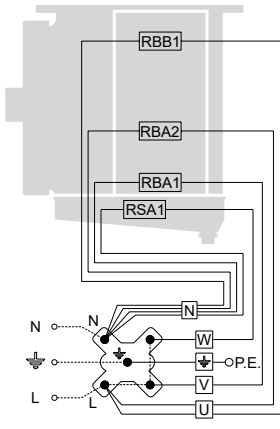
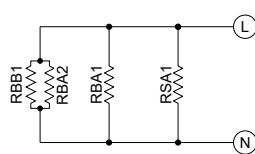
RBA - High power electric heater in coil
RBB - Low power electric heater in coil
RSA - High power electric heater on inner drip tray

Ø315 fan diameter unit

Connection 400V/3/50-60Hz
STANDARD



Connection 230V/1/50-60Hz
to be set

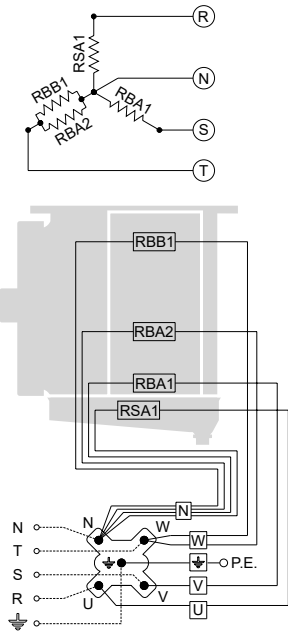


Model	CGC "ED"	311F4	312F4	313F4	314F4
	Ø315	311F6	312F6	313F6	314F6
		311F8	312F8	313F8	314F8
Rows		5	5	5	5
Total power	W	1750	3150	4900	6300

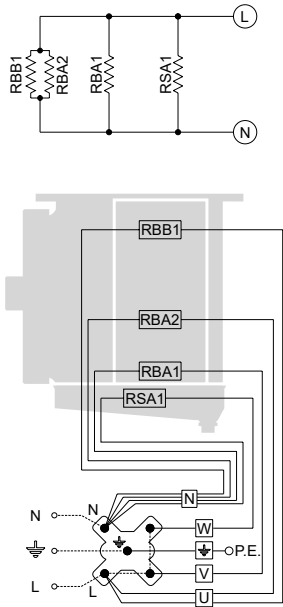
RBA - High power electric heater in coil
RBB - Low power electric heater in coil
RSA - High power electric heater on inner drip tray

Ø350 fan diameter unit with 4-5 rows standard

Connection 400V/3/50-60Hz
STANDARD



Connection 230V/1/50-60Hz
to be set

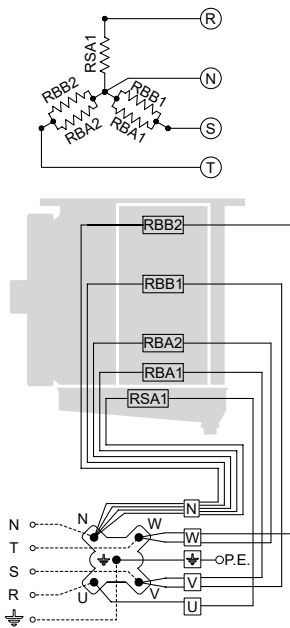


Model	CGC "ED" Ø350	351E4	352E4	353F4	354F4
		351E6	352E6	353F6	354F6
		351E8	352E8	353F8	354F8
		4	4	5	5
Rows					
Total power	W	1750	3150	4900	6300

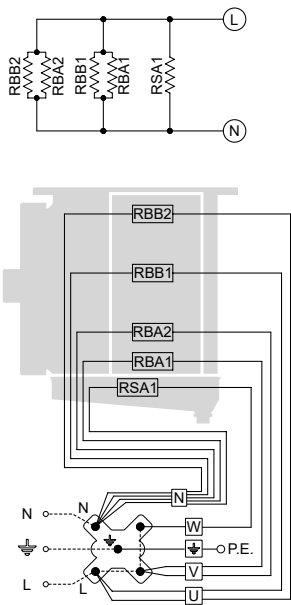
RBA - High power electric heater in coil
RBB - Low power electric heater in coil
RSA - High power electric heater on inner drip tray

Ø350 fan diameter unit with 4-5 rows enhanced

Connection 400V/3/50-60Hz
STANDARD



Connection 230V/1/50-60Hz
to be set

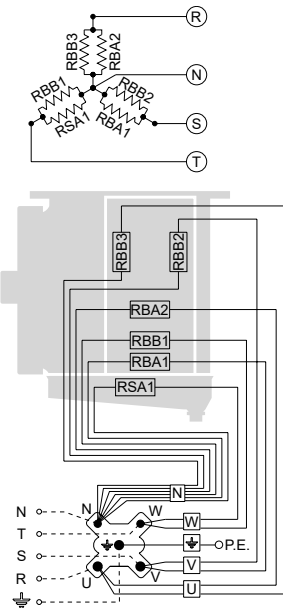


Model	CGC "ED" Ø350	351E4	352E4	353F4	354F4
		351E6	352E6	353F6	354F6
		351E8	352E8	353F8	354F8
		4	4	5	5
Rows					
Total power	W	2000	3600	5600	7200

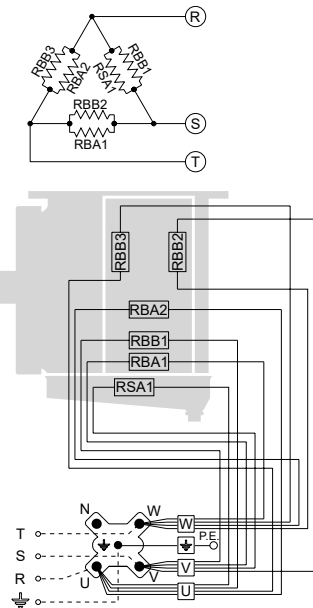
RBA - High power electric heater in coil
RBB - Low power electric heater in coil
RSA - High power electric heater on inner drip tray

Ø350 fan diameter unit with 6 rows standard

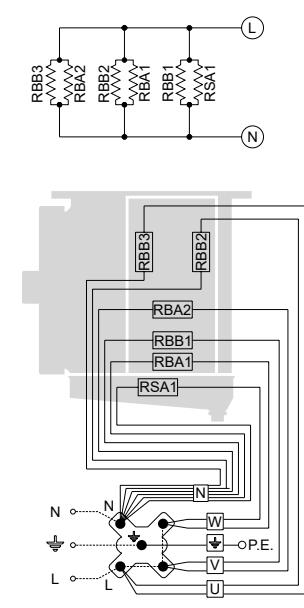
Connection 400V/3/50-60Hz
STANDARD



Connection 230V/3/50-60Hz
to be set



Connection 230V/1/50-60Hz
to be set

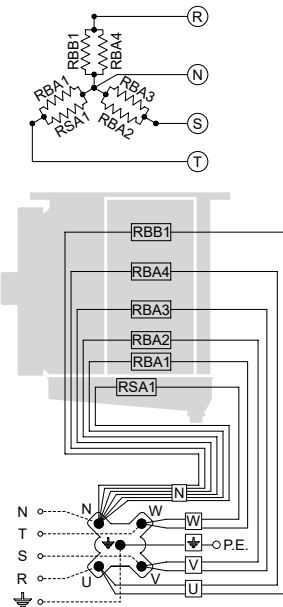


Model	CGC "ED" Ø350	351A4	352A4	353A4	354A4	355A4
		351A6	352A6	353A6	354A6	355A6
		351A8	352A8	353A8	354A8	355A8
Rows		6	6	6	6	6
Total power	W	2250	4050	6300	8100	9900

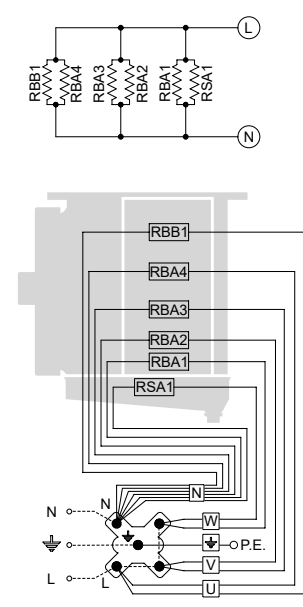
RBA - High power electric heater in coil
RBB - Low power electric heater in coil
RSA - High power electric heater on inner drip tray

Ø350 fan diameter unit with 6 rows enhanced

Connection 400V/3/50-60Hz
STANDARD



Connection 230V/1/50-60Hz
to be set



Model	CGC "ED" Ø350	351A4	352A4	353A4	354A4	355A4
		351A6	352A6	353A6	354A6	355A6
		351A8	352A8	353A8	354A8	355A8
Rows		6	6	6	6	6
Total power	W	2750	4950	7700	9900	12100

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

10. Checks to be performed before start-up

With main switch open and padlocked ("0-OFF" position):

- 10.1 Tightening of all the electrical connections.
- 10.2 Levelling and checking the solidity of the supporting structure.
- 10.3 Correct fastening of panels and components, paying particular attention to the correct fastening of the fan guard grille.
- 10.4 Verification of spaces for maintenance.
- 10.5 Correspondence of the supply voltage to the plate data.
- 10.6 Freedom of movement of the blades of the fans.
- 10.7 Absence of fluid leaks. CO₂, and all refrigerant gases in general, are greenhouse gases: take care not to accidentally release them into the atmosphere. Risk of environmental damage.
- 10.8 Removal of the protective film from the casing.
- 10.9 Checking of the cleanliness of the installation area.
- 10.10 Check that there are no foreign bodies in the vicinity of the fans and of the unit to avoid them being sucked in by the fans.
- 10.11 Checking of the pressure tightness of the unit.
- 10.12 The unit is ready for use after all the instructions and warnings concerning the electrical connections and the fluids have been strictly adhered to.

11. Checks to be performed after start-up

- 11.1 The first start-up must be supervised by a qualified technician and must be carried out with great care.
- 11.2 Check the rotation direction of the motor fans. Contrary rotation could affect the performance of the model.
- 11.3 Check freedom of rotation of the impeller, without rubbing or irregular movements.
- 11.4 Check the movement of the fluid.
- 11.5 Absence of vibrations or unusual noises.
- 11.6 Check that the electric consumption is correct, in any case not exceeding what is reported on the label of the motor fan. If the unit is equipped with defrosting heaters, check that the consumption complies with the data in the table (see Chapter 9).
- 11.7 Check that the screws are tightened correctly (Ref. EN 1090-2).

12. Maintenance

- 12.1 Checks, inspections and maintenance must be carried out by specialised and authorised personnel.
- 12.2 During the operations of maintenance, repair and cleaning, always use personal protective equipment (e.g. gloves sufficiently resistant to mechanical hazards) to reduce the risk of injury in the event of contact with the sharp edges of the metal sheets or with the finned pack.
- 12.3 Do not perform any operations on the unit before disconnecting the power supply. Disconnect the energies and discharge them. Set the main switch to the "0-OFF" position and lock it with a padlock; the key must be kept by the maintenance technician until the work is completed. Wait until all fans have stopped rotating. After disconnecting the power supply, wait 5 minutes before opening the junction boxes on the machine.
- 12.4 It is recommended to check, at least once every six months, that the electrical connection, the earthing and the components subject to the greatest wear (motor fans, switches) are functioning correctly; if worn or obsolete, replace them with new equivalent components.
- 12.5 It is recommended to check, at least once every six months, that all electrical and mechanical parts and circuits affected by the fluids are in good working order; check the integrity and fastening of the fan protection grille.
- 12.6 It is advisable to check, at least once every six months, that the screws are properly tightened (Ref. EN 1090-2).
- 12.7 If a fan is OFF for a long period, it should be switched ON for at least 2 hours every month to remove any trace of moisture inside the motor.
- 12.8 Check the cleanliness of the finned pack at least once a month.
- 12.9 Clean the surfaces of the finned pack and of the fans at least once every six months.
- 12.10 Cleaning of the finned pack:

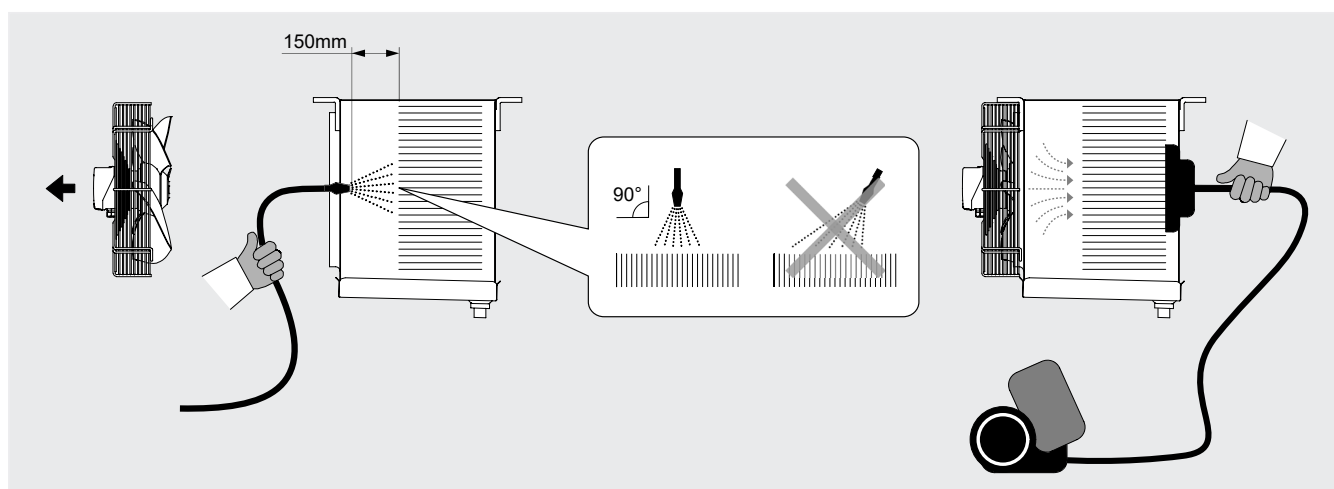


Figure 7

- 12.10.1 Place the main switch in the "OFF" position and wait until all the fans have stopped rotating. Remove the fans by unscrewing the retaining screws.
- 12.10.2 Use compressed air at a maximum pressure of 10 bar and at a minimum distance of 150 mm, directed perpendicularly against the finned pack to avoid bending or damage to the fins.
- 12.10.3 Use a jet of water at a max pressure of 50 bar for damp dirt or grease at a minimum distance of 150 mm, directed perpendicularly against the finned pack, avoiding bends or damage to the fins and pipes. If appropriate add a neutral detergent (refer to its instructions for use). Rinse and then dry with compressed air as indicated in point 12.10.2. Make sure that the electrical components are not affected by the jet of water. If necessary, provide adequate coverage.
- 12.10.4 Aspirate possibly from the air inlet side.
- 12.10.5 After having cleaned the finned pack, perform a visual inspection to identify any dirt or the presence of fins that are damaged (repeat the cleaning operation if necessary).
- 12.11 Only use original spare parts. Do not wait until the component is completely worn out, preventive replacements can greatly improve performance and extend the life of the model.
- 12.12 For maintenance of any accessories or components mounted on the model, refer to their user-manuals.
- 12.13 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.

12.14 After every maintenance work, carry out the checks before commissioning according to Chapter 10 and after commissioning according to Chapter 11.

12.15 When repairing the system, be aware that even with non-flammable refrigerants (e.g. CO₂ is used as an extinguishing medium), some traces of lubricating oil may be entrained and thus flammable mixtures may be created. It is therefore recommended:

- do not smoke in the vicinity of the model or system;
- do not use naked flames in the vicinity of the model or system;
- avoid any contact between the fluid and the fire;
- remove any means of ignition from the installation site;
- only perform any welding or soldering repairs after the model and/or system has been completely drained. Avoid releasing the fluid into the atmosphere.

12.16 In case of refrigerant leakage pay attention to the nature of the fluid used.

CO₂ in particular tends to stratify near the ground (see Chapter 1.23).

It is recommended to leave the installation site immediately and to activate the safety measures according to the regulations in force in case of:

- visible continuous fluid leakage from the model or other parts of the installation;
- momentary but significant leakage of fluid from the model or other parts of the installation;
- feeling of discomfort by personnel;
- activation of CO₂ or other refrigerant alarm sensors;

In the event of operators feeling unwell, move away from the system and contact a doctor immediately. All operations must be carried out by qualified personnel. The use of PPE is recommended (see Chapter 13). Ensure adequate ventilation of the working environment.

12.17 Always take into account the working pressure of the system: in the event of a rupture, there is a risk of injury to persons or damage to property due to the projection of debris, even from a great distance. Before carrying out any work, always make the system safe as per current regulations. The use of PPE is recommended (see Chapter 13).

12.18 In the event of a leak of refrigerant fluid, check that it has not penetrated into rooms below or adjacent to the place of installation: secure the rooms as per current regulations.

12.19 Do not use the ventilation ducts to evacuate refrigerant vapours.

12.20 In the event of fire, evacuate the premises immediately and take all safety measures in accordance with the regulations in force.

12.21 When dismantling and scrapping the unit, ensure that the appropriate PPE is used (see Chapter 13).

Ensure that the fluids are completely drained and properly disposed of. Pay particular attention to sharp edges.

12.22 Troubleshooting:

Problem	Possible causes	Possible solutions
The fan motors do not rotate	Interruption of the electric power line (conductors, disconnecting switches, regulators, pressure switches, etc)	Check electric power line up to fan motor junction and reset
	Intervention of thermal protection of fan motors	Check project figures and data especially the working temperatures
		Clean finned pack and carry out maintenance more frequently
		Remove obstacles
	Burning of motor windings	Replace burnt motors
The model vibrates	Inadequate fixing of the model	Adequately fasten model
	Loosened fan motor fastening screws	Restore correct fastening
	Unbalanced fan motors	Replace unbalanced fan motors
The noise level of model is too high	Obstructed finned pack	Clean finned pack or carry out maintenance more frequently
	Unbalanced fan motors	Replace unbalanced fan motors
	Worn-out fan motor bearings	Replace noisy fan motors

13. Residual risks

13.1 The equipment presents a number of risks that have not been fully eliminated from the design point of view or through the installation of adequate protections. Based on such risks, it is reported which PPE should be used by the operators or which behaviours and procedures should be adopted.

Sufficient space must be provided during the installation of the unit to limit these risks. To preserve these conditions, the aisles and areas surrounding the unit must always:

- be kept free of obstacles (such as ladders, tools, containers, boxes...);
- be clean and dry;
- be well lit if necessary.

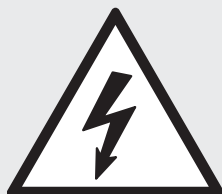
List of residual risks that remain on the unit:

BURN



The operator (in particular situations or during maintenance) intentionally or unintentionally touches a hot or frozen surface: if necessary use insulating gloves and/or wait for cooling/heating of the surfaces.

ELECTROCUTION



Contact with live electrical parts during maintenance operations carried out with the presence of voltage: operations reserved for qualified and authorised operators, equipped optionally with PPE and insulating tools - in general, turn off the power supply to the machine by switching the main switch open "O" and lock it in this position.

SHARP FINS



The operator at the stages of use and cleaning must be careful of the fins as they are sharp.

CUTTING AND CRUSHING BY BODIES IN MOTION



The operator (in particular situations or during maintenance) must pay attention to the fans. In general disconnect the fan by placing the safety switch located near the fan shroud in the open position "O".

Headers can reach low temperatures, avoid contact.

Airflow from fans can cause discomfort to personnel and damage to property.

Any use other than that specified in this manual is considered incorrect.

During operation of the equipment, no other types of work or activities are permitted that are to be considered as incorrect and that in general may entail risks for the safety of persons and damage to property.

It will be considered predictable misuse:

- Failure to disconnect the power supply with the main switch in the open "O" position (or disconnection of the plug socket) before carrying out adjustment, reset and maintenance work.
- Insufficient maintenance and periodic checks.
- Structural changes or modifications to the operating logic.
- Tampering with the guards and safety systems.
- The presence of third persons during normal operation.
- Non-use of PPE by operators and any maintenance technicians.
- Use of inappropriate clothing and/or accessories (e.g. ties, ribbons, loose sleeves, necklaces...).



The behaviours previously described are prohibited.

It is forbidden to remove or make illegible safety, hazard and obligation signs shown on the equipment.

It is forbidden to remove or tamper with the guards of the equipment

Machine modifications are prohibited: in such cases request the intervention of Modine.

The following table summarises the PPE (Personal Protection Equipment) to be used during the various phases of the life of the equipment (each stage involves the obligation to use and provide PPE), in order to protect the health and safety of operators.

The responsibility for the identification and choice of the type and category of PPE that is appropriate and suitable lies with the user.

								
Phase	Protective clothing	Safety footwear	Gloves	Goggles	Visor	Ear protectors	Mask	Helmet or head gear
Transportation	NP	NP	NP	NP	NP	NP	NP	NP
Handling	X	X	X	X	NP	NP	NP	X
Unpacking	X	X	X	X	NP	NP	NP	X
Assembly	X	X	X	X	NP	O	NP	X
Ordinary use	NP	NP	NP	NP	NP	NP	NP	NP
Adjustments	X	X	X	NP	X	O	NP	NP
Cleaning	X	X	X	NP	X	O	X	NP
Maintenance	X	X	X	NP	X	O	O	X
Dismantling	X	X	X	NP	X	O	NP	X
Demolition	X	X	X	X	NP	O	NP	O

X : Recommended PPE

O : PPE available or to be used if necessary

NP : PPE not recommended

The PPE used must comply with the directives of the product and bear the CE marking (for the European market).

The definitions of the phases of life of the equipment are described in the following table.

Phase	Description
Transportation	It consists of transferring the equipment from one location to another through the use of suitable means.
Handling	It consists of transferring the equipment from and on the means used for transportation and movements within the plant.
Unpacking	It involves removal of all the materials used for packaging of the equipment.
Assembly	It involves all the assembly operations that initially prepare the equipment for fine-tuning.
Ordinary use	Use for which the equipment is intended (or that is considered usual) in relation to its design, construction and function.
Adjustments	These involve the adjustment, fine-tuning and calibration of all those devices which must be adapted to the condition of operation normally envisaged.
Cleaning	It involves the removal of dust, oil and residues of processing that could compromise the efficient operation and use of the equipment, as well as the health and safety of the operator.
Maintenance	It involves periodic verification of the parts of the equipment that can wear out and that must be replaced.
Dismantling	It involves the complete or partial dismantling of the equipment for any type of necessity.
Demolition	It involves the definitive removal of all parts of the equipment resulting from the operation of definitive dismantling to allow the possible recycling or differentiated collection of components according to the procedures laid down by the existing rules of law.

14. Reference standards and directives

- MACHINE DIRECTIVE 2006/42/EC
- LOW VOLTAGE DIRECTIVE 2014/35/EU
- ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2014/30/EU
- PRESSURE VESSELS DIRECTIVE 2014/68/EU, module A 2 for Cat. I or Art. 4 Par. 3, as indicated on the PED label of the exchanger.
- ERP DIRECTIVE 2009/125/EC
- UNI EN 378:2020 REFRIGERATION SYSTEMS AND HEAT PUMPS

15. Technical data

15.1 Technical data

Model code	Label on the unit
Serial number	Label on the unit
Year of manufacture	Label on the unit
Max pressure PS	Label on the unit
Project number	Documents relating to offer / order
Fluid type	Documents relating to offer / order
Internal volume	Label on the unit
Weight	Label on the unit
Sound pressure level	Documents relating to offer / order
Current	Label on the unit and Technical manual Chapt. 9
Voltage	Label on the unit and Technical manual Chapt. 9

15.2 Identification code

Series	Fan diameter	Fan number	Rows	Fin spacing	Reduced module	Electric defrost	Features
CGC	25	1	E	4	R	ED	.1079
	25 = Ø250	1	A = 6	4 = 4mm			
	31 = Ø315	2	E = 4	6 = 6mm			
	35 = Ø350	3	F = 5	8 = 8mm			
		4	G = 3				
		5					

[R] = optional reduced module
[Ø250 only]

[ED] = optional electric defrost

[.xxxx] = optional features

15.3 Documents supplied with the current model or available at: <https://www.modinecoolers.com/documents/>

15.3.1 Technical Manual - Instructions for Use

15.3.2 Declaration of Incorporation

15.3.3 Operating Manual - Fans (as long as required)

15.3.4 Circuit diagram (if applicable)

15.3.5 User's manuals for accessories (if any)



Annex PQ 08.02.30-02 rev.04
Modine CIS Italy Srl
Via Giulio Locatelli, 22
33050 POCENIA (UD) Italia

GAMMA PRODOTTO - PRODUCT RANGE - PRODUKTE SERIE - GAMME PRODUIT - GAMA PRODUCTO

Aeroevaporatori, Unit coolers, Luftverdampfer, Aeroevaporateur, Aerovaporador

**EVS, EP, MIC, CTE, GCE, GDE, GME, GSE, LFE, GLE, STE, ICE, FTE, IDE, SRE,
CDC, CDM, CGD, CDD, CDL, CGL, CGC, CGS
AGC, AGD, AGS, AGL, AP**

DICHIARAZIONE DI INCORPORAZIONE (2006/42/EC - II B)

DECLARATION OF INCORPORATION - EINBAUERERKLÄRUNG - DECLARATION D'INCORPORATION - DECLARACIÓN DE INCORPORACIÓN

Il fabbricante dichiara che ogni modello della gamma di prodotto qui identificata:

- non deve essere messo in servizio finché la macchina in cui sarà incorporato non sia stata dichiarata conforme alla direttiva 2006/42/CE;
- sono stati applicati e rispettati i seguenti requisiti essenziali della direttiva macchine 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1);
- è conforme alle disposizioni della direttiva 2014/35/UE
- è conforme alle disposizioni della direttiva 2014/30/UE
- è conforme alle disposizioni della direttiva 2014/68/UE, Modulo A per Cat. I oppure Art. 4 Par. 3, come indicato su etichetta dati PED scambiatore;
- è conforme alle disposizioni della direttiva 2009/125/EC

The manufacturer declares that each model of the product range hereby identified:

- must not be set into operation until the machine into which it will be incorporated has been declared in accordance with the provisions stated in directive 2006/42/EC;
- that the following essential requirements of Machinery Directive 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1) have been duly applied and fulfilled;
- complies with the provisions of revised directive 2014/35/UE
- complies with the provisions of revised directive 2014/30/UE
- complies with the provisions of revised directive 2014/68/UE, Module A for Cat. I or Art. 4 Par. 3, as indicated on the heat-exchanger's PED data label;
- complies with the provisions of revised directive 2009/125/EC

Der Hersteller erklärt, dass jedes Modell der hier gekennzeichneten Produktserie:

- solange nicht in Betrieb genommen werden darf, bis die Maschine oder Anlage, in welche dieser eingebaut wird, den Bestimmungen der Richtlinie 2006/42/EC entspricht;
- die folgenden grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1) zur Anwendung kommen und eingehalten werden;
- den Bestimmungen der Richtlinie 2014/35/UE entspricht;
- den Bestimmungen der Richtlinie 2014/30/UE entspricht;
- den Bestimmungen der Richtlinie 2014/68/UE Vorgang A für Kategorie I oder Artikel 4 Absatz 3 entspricht, gemäß Angaben auf der PED Etikette des Wärmeaustauschers;
- den Bestimmungen der Richtlinie 2009/125/EC

Le fabricant déclare que chaque modèle de la gamme de produit ici identifié:

- ne doit pas être mis en service avant que la machine dans laquelle il sera incorporé ne soit déclarée conforme aux dispositions de la directive 2006/42/EC;
- est conforme aux dispositions de la directive 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1);
- est conforme aux dispositions de la directive 2014/35/UE;
- est conforme aux dispositions de la directive 2014/30/UE;
- est conforme aux dispositions de la directive 2014/68/UE, Module A pour Cat.I ou Art.4 Par.3, comme indiqué sur étiquette données PED échangeur;
- est conforme aux dispositions de la directive 2009/125/EC

El fabricante declara que cada modelo de la gama de producto aquí identificado:

- no se tiene que poner en marcha hasta que la máquina en la cual se instalará sea declarada conforme a las condiciones indicadas en la norma 2006/42/EC;
- es conforme a las condiciones de la norma 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1);
- es conforme a las condiciones de la norma 2014/35/UE;
- es conforme a las condiciones de la norma 2014/30/UE;
- es conforme a las condiciones de la norma 2014/68/UE, Módulo A para Categoría I, o Art.4 Par. 3, como indicado en la etiqueta datos PED intercambiador.
- es conforme a las condiciones de la norma 2009/125/EC

ATTESTATO DI COLLAUDO

TEST CERTIFICATE - ABNAHMEZEUGNIS - ATTESTATION D'ESSAIS - CERTIFICADO DE CONFORMIDAD DE LA PRUEBA

Il fabbricante dichiara che ogni modello della gamma di prodotto qui identificata ha superato con esito positivo i collaudi funzionali e di sicurezza elettrica, secondo le norme sotto indicate

The manufacturer attests that each model of the product range hereby indicated has passed the relevant operating and electrical safety tests in accordance with the following standards

Der Hersteller erklärt, dass jedes Modell der hier gekennzeichneten Produktserie und je nach elektrischer Ausstattung zugeordnete Modell das funktionsgerechte Abnahmeverfahren sowie das der elektrischen Sicherheit gemäß den u. g. Richtlinien erfolgreich bestanden hat.

Le fabricant déclare que chaque modèle de la gamme de produit ici indiqué a passé avec succès les essais fonctionnels et de sécurité électrique, conformément aux normes indiquées

El fabricante declara que cada modelo de la gama de producto aquí indicada ha superado las pruebas funcionales y de seguridad eléctrica, de acuerdo con las siguientes normas

CEI EN 60335-2-40, 60335-1

Date of issue 28/09/2021

Modine CIS Italy

Persona autorizzata a costituire la documentazione tecnica pertinente (ANNEX II B.5)
Person authorized to compile the relevant technical documentation
Bevollmächtigte Person, die die relevanten technischen Unterlagen zusammenstellt
Personne autorisée à constituer le dossier technique en question
Persona facultada para elaborar la documentación técnica pertinente
Andrea Tullis

direzione tecnica Modine CIS Italy

technical director – technischer Leiter – Director técnico – Directeur technique

Roberto Benedetti

Roberto Benedetti

Garanzie

Tutte le informazioni tecniche presenti in questa edizione sono basate su prove che riteniamo ampie e attendibili, ma che non possono essere riferite a tutta la casistica dei possibili impieghi. Pertanto, l'acquirente deve accertare l'idoneità del prodotto all'uso per il quale intende destinarlo, assumendo ogni responsabilità derivante dall'utilizzo dello stesso. La società venditrice, su richiesta dell'acquirente, si renderà disponibile fornendo tutte le informazioni utili per il migliore utilizzo dei suoi prodotti. Tutti i nostri modelli sono garantiti per due anni dalla data di fatturazione degli stessi; si prega di contattare la sede legale di Modine CIS Italy S.r.l. per un maggior approfondimento. Sono ad ogni modo escluse da ogni forma di garanzia le avarie occasionali quali quelle dovute al trasposto, le manomissioni da parte di personale non autorizzato, l'utilizzo non corretto e le errate installazioni a cui vengano sottoposti i prodotti.

La costante ricerca svolta dai nostri laboratori per garantire prodotti sempre migliori e innovativi potrebbe causare la modifica dei dati qui contenuti. Sarà dunque compito dell'utilizzatore mantenersi aggiornato sulla loro validità.

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Gewährleistung

Alle technischen Informationen in dieser Ausgabe basieren auf Tests, die wir für weit gefächert und zuverlässig halten, aber nicht alle möglichen Anwendungen einbeziehen können. Daher muss der Käufer die Eignung des Produkts für den Zweck, für den es bestimmt ist, überprüfen, und die gesamte Verantwortung für die Verwendung derselben übernehmen. Der Verkäufer steht auf Anfrage des Käufers zur Verfügung, alle nützlichen Informationen für die beste Anwendung seiner Produkte zu erteilen. Alle unsere Produkte sind für zwei Jahre ab dem Rechnungsdatum der Produkte garantiert; für weitere Informationen konsultieren das Rechtsbüro von Modine CIS Italy S.r.l. Von jeder Form der Garantie ausgeschlossen sind auf alle Fälle eventuelle Beschädigungen durch den Transport, Manipulationen durch nicht autorisiertes Personal, nicht korrekter Gebrauch und fehlerhafte Installationen.

Durch die ständige Forschung unserer Labors, um immer bessere und innovativere Produkte zu garantieren, kann es zur Änderung der hier beinhaltenden Daten kommen, es ist daher Aufgabe des Benutzers sich über die Gültigkeit auf dem Laufenden zu halten.

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Warranty

All technical information in this edition is based on tests carried out, which we deem exhaustive and reliable but which cannot be referred to all records of possible applications. Therefore, the purchaser must ascertain product suitability with regard to its intended use, undertaking all responsibility arising from its said use. Upon request by the purchaser, the seller shall be available to supply all useful information in order to use their products better. All our models have a two-year warranty with effect from the date of the said invoice. Please refer to the Legal Office of Modine CIS Italy S.r.l. for more in-depth information. However, occasional failures such as those due to transport, tampering by unauthorised personnel, incorrect use and incorrect installation, which the products are subjected to, are all excluded from any form of warranty.

As a result of continuing research and design by our technical laboratories, aimed at offering top quality and innovative products, the information given in this guide may be subject to modification at any time without prior notice; it is up to the user to keep up to date on all possible modifications.

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Garantias

Todas las informaciones técnicas presentes en esta edición se basan en pruebas que consideramos extensas y fiables, pero que no pueden tomarse como referencia para toda la variedad de posibles aplicaciones. Por lo tanto, el comprador debe comprobar la compatibilidad del producto con el uso para el que pretende destinarlo, asumiendo toda la responsabilidad derivada del uso del mismo. El vendedor estará a disposición del comprador para cualquier información útil que pueda servir para el mejor uso posible de sus productos. Todos nuestros modelos cuentan con una garantía de dos años desde la fecha de facturación de los mismos. Para más información, se ruega consultar la Oficina Legal de Modine CIS Italy S.r.l. Quedan excluidas de cualquier forma posible de garantía las averías fortuitas que puedan sufrir los productos, como las debidas al transporte, a la manipulación por parte de personal no autorizado, a un uso no adecuado y a una instalación incorrecta.

En nuestros laboratorios se trabaja sin interrupción para garantizar la mejora y la innovación de los productos. Esto podría causar la modificación de algunos de los datos de esta guía. Por lo tanto, aconsejamos al usuario averiguar siempre la actualización y validez de los mismos.

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Garantie

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La recherche constante de nos laboratoires visant à garantir des produits toujours meilleurs et innovants pourrait causer la modification des données contenues ici. Il incombera à l'utilisateur de se tenir informé sur leur validité.

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